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Reproducibility and Stability of the Hierarchical Structuring of Platform Social Responsibility: An Interpretive Structural Modeling Approach

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A B S T R A C T

This study aimed to model the hierarchical structure of platform social responsibility and evaluate the reproducibility and stability of the resulting levels by examining the direct, indirect, driving, and dependence relationships among the model variables. This study employed Interpretive Structural Modeling (ISM) using expert-based pairwise judgments to determine the structural relationships among the dimensions and components of social responsibility in platform-based businesses. Twenty academic and professional experts with at least five years of relevant experience were selected through purposive judgmental sampling. The Structural Self-Interaction Matrix was developed from expert assessments and converted into initial and final reachability matrices through binary transformation and application of transitivity. Level partitioning was then performed to establish the hierarchical position of the variables. MICMAC analysis was used to assess driving and dependence power and to classify the variables according to their structural roles. Structural stability was evaluated by examining the persistence of hierarchical positions and influence patterns after incorporating indirect and transitive relationships. The ISM analysis produced an eight-level hierarchical structure. Social pressures, political–legal conditions, socioeconomic consequences, and access and inclusion occupied the most foundational level, whereas service quality, content protection, and environmental protection projects were positioned at the most dependent level. In the final 22-variable structural model, business model and technology and innovation demonstrated the strongest direct influence, both scoring 584, and retained high indirect influence scores of 576 and 575, respectively. Anti-corruption and anti-bribery also showed substantial direct and indirect influence, with values of 529 and 526. Waste management had the lowest direct and indirect influence values, both equal to 320. The relatively small differences between direct and indirect influence scores across major variables indicated structural consistency and supported the stability of the hierarchical configuration. The findings demonstrate that platform social responsibility is a multilayered and structurally interdependent system in which contextual, institutional, technological, and business-model variables function as upstream drivers, while operational and visible responsibility outcomes emerge at more dependent levels; the stability of direct and indirect relationships supports the reproducibility of the identified ISM hierarchy.

Keywords: *Platform Social Responsibility; Corporate Social Responsibility; Digital Platforms; Structural Stability; Reproducibility.*

1. Introduction

Digital platforms have become central organizational infrastructures through which economic exchange, social interaction, information circulation, service delivery, employment, and increasingly public-interest functions are coordinated. Their rapid expansion has altered the conventional boundaries of firms and created organizational ecosystems in which platform owners, users, workers, advertisers, suppliers, regulators, investors, and other stakeholders interact through technologically mediated rules and algorithmic processes. Unlike traditional firms, platform businesses often create value by orchestrating interactions rather than by directly producing all goods or services exchanged within their ecosystems. This structural characteristic substantially broadens the scope of corporate responsibility because the social consequences of platform activity emerge not only from internal organizational decisions but also from the behavior of multiple external actors whose interactions are enabled, ranked, governed, or constrained by the platform. Accordingly, corporate social responsibility in platform-based businesses cannot be adequately understood as a peripheral set of philanthropic activities; rather, it increasingly concerns the design of digital infrastructures, governance mechanisms, market relationships, information practices, environmental consequences, and institutional arrangements through which platforms exercise economic and social influence. Research on corporate digital responsibility has consequently emphasized that responsibility in digitally intensive organizations extends across interconnected organizational and technological domains, including data governance, privacy, artificial intelligence, transparency, cybersecurity, digital inclusion, and the broader societal effects of digital services (Trittin-Ulbrich et al., 2025; Wirtz et al., 2023).

The transformation from conventional corporate environments to digitally mediated ecosystems also complicates traditional assumptions concerning who bears responsibility for organizational outcomes. Platform firms frequently function as intermediaries, rule setters, market organizers, information gatekeepers, and algorithmic decision makers at the same time. Such organizations influence access to economic opportunities, visibility of information, consumer choices, reputational outcomes, and patterns of participation, even when they do not directly create the content, product, or service involved. From the perspective of political corporate social responsibility, the gatekeeping position of digital platforms generates responsibilities that extend beyond conventional compliance and profit-oriented obligations, particularly when platforms influence rights, public discourse, participation, and access to socially significant resources (Gilbert et al., 2024). These concerns are especially important because algorithmic systems can structure information flows and security-related responses at scales that exceed traditional firm–customer relationships. The international responsibility of social platforms in contexts involving algorithmic management and security crises further illustrates that platform responsibility can involve legal, ethical, and societal questions simultaneously (Mohammadi & Sotoudeh, 2023). Thus, platform social responsibility is inherently multidimensional and cannot be reduced to a single variable such as legal compliance, environmental performance, stakeholder satisfaction, or information disclosure.

The multidimensionality of platform responsibility is also evident in the diversity of social and organizational functions performed through digital platforms. Platform environments may facilitate commercial exchange, professional collaboration, learning, community participation, health communication, and the creation of new forms of social value. Earlier work has shown that platform-based structures can provide environments for developing collaborative and interprofessional competence, illustrating that digitally or organizationally mediated platforms may operate as more than transactional mechanisms and may support broader social capacities (Coiro et al., 2016). Similarly, nonprofit and socially oriented platform business models demonstrate that platform architecture can be intentionally reoriented toward social benefit rather than being designed exclusively around commercial extraction or network expansion (Mancha et al., 2021). These developments reinforce the argument that responsibility in platform businesses should be conceptualized in terms of the configuration of the entire ecosystem. The business model, technological architecture, rules governing participation, access conditions, data practices, stakeholder relationships, and outcomes produced for society are interdependent parts of a broader responsibility structure.

Transparency constitutes one of the most recurrent issues in this emerging field. Because platforms collect, process, rank, and redistribute extensive amounts of information, their responsibility is partly determined by the extent to which stakeholders can understand relevant organizational decisions and assess their social consequences. Research on corporate social responsibility reporting platforms has demonstrated the importance of digital reporting

infrastructures for enabling transparency and strengthening accountability, suggesting that technological platforms can shape not merely the dissemination of CSR information but also the relationship between disclosure and stakeholder oversight (Watts, 2015). More recent evidence shows that information interactions on social media platforms can influence the quality of corporate social responsibility disclosure, emphasizing that digital communication environments affect the production, circulation, and perceived credibility of CSR-related information (Niu et al., 2025). Transparency therefore operates at several levels in platform responsibility: firms disclose their own policies and impacts, platforms govern the visibility of information produced by others, and algorithmic systems determine which information is prioritized, suppressed, recommended, or monetized. These overlapping roles make transparency simultaneously an ethical obligation, a governance mechanism, and a structural feature of the platform ecosystem.

The relationship between transparency and stakeholder behavior is particularly important in contexts where platform-mediated information affects consumption and sustainability decisions. Evidence from digital markets indicates that transparency regarding corporate social responsibility can influence consumer behavior toward environmentally oriented products. For example, research on green agricultural products has shown that CSR information transparency on digital platforms can affect consumption decisions, demonstrating the behavioral consequences of disclosure within platform-mediated markets (Fu et al., 2023). This finding has broader implications for platform social responsibility because it shows that responsible behavior is not confined to the platform operator itself. Instead, the architecture of information provision can influence how users evaluate sellers, products, institutions, and sustainability claims. Platforms can therefore amplify or weaken responsible practices by determining the accessibility, credibility, and prominence of CSR-related information.

Environmental considerations further expand the scope of platform responsibility. Digital platforms are frequently perceived as relatively immaterial because much of their visible activity occurs through software, interfaces, and data. Nevertheless, platform ecosystems depend on energy-consuming infrastructures, logistics systems, data centers, devices, transportation networks, and digitally coordinated consumption patterns. Research examining digital platforms and corporate social responsibility has identified important connections between platform development, environmental responsibility, and public health outcomes, suggesting that the social consequences of digitalization extend well beyond purely technical performance (Wang et al., 2024). The environmental dimension of platform social responsibility may consequently include energy consumption, pollution reduction, waste management, green products, environmental protection initiatives, and the capacity of digital systems to influence environmentally consequential behaviors across the wider ecosystem. These factors interact with economic, technological, and regulatory dimensions rather than operating independently.

The legal and ethical responsibilities of platforms are similarly complex. Platforms operate across jurisdictions and may simultaneously confront regulations concerning consumer protection, employment, taxation, privacy, content governance, competition, cybersecurity, and fundamental rights. The legal development of socially responsible social media platforms demonstrates the growing recognition that responsibility must be embedded in institutional and regulatory structures rather than left exclusively to voluntary organizational commitments (Bashir, 2024). Legal compliance, however, represents only one component of the broader responsibility architecture. Ethical responsibilities may require platforms to address corruption, discrimination, exclusion, unfair treatment, manipulative design, algorithmic opacity, or practices that technically comply with existing rules but nevertheless create substantial social harms. As digital platforms increasingly mediate socially consequential interactions, the distinction between legal responsibility and ethical legitimacy becomes particularly important. A platform may comply with minimum legal requirements while still facing questions regarding fairness, transparency, access, human rights, or the societal effects of its governance choices (Gilbert et al., 2024; Trittin-Ulbrich et al., 2025).

The COVID-19 pandemic further demonstrated the strategic and societal importance of platform responsibility by increasing reliance on e-commerce and other digital infrastructures. Research on Chinese e-commerce platforms during the early stage of the pandemic identified multiple approaches through which platforms implemented corporate social responsibility in response to a large-scale societal crisis (Zhang et al., 2023). This evidence illustrates that platform responsibility becomes especially visible when organizations must respond rapidly to disruptions affecting consumers, workers, suppliers, communities, and public institutions. In such situations, platform capabilities such as

technological adaptability, network coordination, information distribution, access, logistics, and business-model flexibility can become mechanisms through which social responsibility is enacted. Crisis conditions therefore highlight the interdependence between operational characteristics and responsibility-related outcomes. Social responsibility cannot be separated from the technical and economic structures through which platform firms function.

This interdependence is central to contemporary approaches to corporate digital responsibility. Recent scholarship has argued for stronger bridges between organization theory and information systems in order to understand digital responsibility as an organizational phenomenon rather than as a collection of isolated ethical issues (Trittin-Ulbrich et al., 2025). From this perspective, responsible digital behavior emerges through relationships among organizational structures, technological systems, institutional environments, stakeholder demands, and managerial choices. Similarly, corporate digital responsibility in service firms has been conceptualized at the ecosystem level, recognizing that responsibility extends beyond a single organization and involves relationships with customers, partners, employees, regulators, technological providers, and other actors (Wirtz et al., 2023). These perspectives imply that studies examining platform social responsibility should move beyond identifying lists of relevant variables and instead investigate how those variables are structurally related.

Existing research has made considerable progress in identifying the antecedents, dimensions, practices, and consequences associated with corporate social responsibility in platform-based businesses. A recent meta-analytic examination of antecedents and outcomes of CSR in platform businesses highlights the diversity of drivers and consequences involved and reinforces the need to understand platform CSR as a system of interconnected factors rather than as a single managerial practice (Tavana et al., 2025). However, identifying significant antecedents and consequences does not, by itself, reveal their structural ordering. Two variables may both be important while occupying very different positions in the system: one may constitute a foundational driver, another may function as an intermediate transmission mechanism, and a third may primarily represent a dependent outcome. Without determining this hierarchy, it remains difficult to distinguish structural causes from manifestations, to identify leverage points for managerial intervention, or to understand how changes in one part of the platform responsibility system propagate through other components.

This limitation is particularly important when the number of relevant variables is large. Economic factors such as profitability, cost efficiency, innovation, employment creation, and shareholder responsibility may interact with environmental factors such as energy use, waste management, pollution reduction, and environmental protection. At the same time, legal–ethical factors such as transparency, human rights, regulatory compliance, anti-corruption, and workplace justice intersect with platform-specific responsibilities including access and inclusion, privacy, algorithmic transparency, social participation, and content protection. These variables are further embedded within operational features such as scalability, technological innovation, network interactions, service quality, and the underlying business model. Finally, contextual forces including technological change, cultural transformation, social pressure, and political–legal conditions may influence several layers of the system simultaneously. A purely linear framework is therefore unlikely to adequately represent platform social responsibility.

A structural approach is also justified by the fact that platform responsibility involves chains of influence rather than only direct relationships. A change in political–legal conditions may alter platform governance; governance may affect algorithmic transparency; algorithmic transparency may influence trust, participation, or content management; and these outcomes may subsequently affect brand reputation, employee performance, or financial results. In other words, an apparently distal factor can produce important consequences through indirect pathways. The distinction between direct and indirect influence is essential for understanding the architecture of responsibility because variables with modest immediate effects may acquire substantial strategic importance when their downstream pathways are considered. Conversely, variables that appear prominent in visible outcomes may depend strongly on deeper contextual and organizational drivers.

The logic of interconnected systems also raises the issue of structural stability. In graph-based analysis, relationships among elements can produce tightly interconnected structures in which multiple pathways connect the same components. Concepts derived from graph theory, including the analysis of strongly connected components and depth-first structures, illustrate how complex systems may contain clusters of mutually reachable elements rather than simple one-directional chains (Tarjan & Zwick, 2022). Although

platform social responsibility is not reducible to a graph-theoretical problem, this systems perspective is useful because it highlights the importance of examining whether a proposed hierarchy is robust to indirect relationships and whether apparently distinct variables form structurally interdependent clusters. A responsibility model that changes substantially when indirect effects are introduced would provide a weaker basis for interpretation than a hierarchy whose principal levels and influential variables remain comparatively stable.

Reproducibility is therefore a significant methodological and substantive concern. In the context of platform social responsibility modeling, reproducibility refers not simply to repeating a statistical calculation, but to the extent to which the same or substantively similar hierarchy can be reconstructed from a consistent set of expert judgments and structural rules. Stability refers to the persistence of variable positions and influence patterns after indirect pathways, transitive relationships, and dependence structures are incorporated. These issues are important because expert-based structural modeling necessarily involves interpretive judgments. A credible model should therefore demonstrate that its most important hierarchical relationships are not arbitrary products of a single comparison but reflect coherent and persistent structural patterns.

Interpretive Structural Modeling offers an appropriate framework for addressing this problem because it converts a complex set of pairwise contextual relationships into a hierarchical structure. By distinguishing foundational drivers, intermediate variables, and highly dependent outcomes, ISM allows researchers to move beyond descriptive classifications toward an explanation of systemic ordering. Complementary driving–dependence analysis further makes it possible to determine which variables possess strong driving power, which are predominantly dependent, which operate as linkage variables, and which remain relatively autonomous. This is particularly valuable in platform settings, where business models, technological infrastructures, legal requirements, social expectations, and stakeholder outcomes are mutually connected. The use of direct and indirect influence structures additionally allows researchers to evaluate whether the apparent prominence of a variable persists when the entire network of relationships is considered.

Such a structural perspective also contributes to managerial decision making. Platform organizations frequently face numerous responsibility-related demands simultaneously, but resources for responding to these demands are finite. Treating all CSR variables as equally important can lead to fragmented initiatives and inefficient prioritization. A hierarchical model can instead identify variables that function as upstream leverage points. Interventions directed toward such variables may affect several downstream elements simultaneously, whereas interventions aimed exclusively at dependent outcomes may produce limited systemic change. For instance, platform business-model design, technological innovation, legal–ethical governance, access mechanisms, or broader contextual pressures may influence multiple social, environmental, reputational, and economic outcomes. Understanding these pathways can therefore assist managers and policymakers in distinguishing strategic drivers from visible consequences.

At the theoretical level, a stable hierarchy can also help integrate fragmented streams of platform responsibility research. Existing studies have separately examined disclosure quality (Niu et al., 2025), environmental and public-health implications (Wang et al., 2024), platform legitimacy and gatekeeping (Gilbert et al., 2024), legal responsibility (Bashir, 2024), transparency and sustainable consumption (Fu et al., 2023), nonprofit platform models (Mancha et al., 2021), algorithmic responsibility (Mohammadi & Sotoudeh, 2023), crisis-related CSR practices (Zhang et al., 2023), accountability through reporting infrastructures (Watts, 2015), service ecosystem responsibility (Wirtz et al., 2023), and organizational approaches to digital responsibility (Trittin-Ulbrich et al., 2025). Taken together, these studies demonstrate the breadth of the field, but they also reveal the challenge of integrating economic, social, ethical, environmental, technological, and institutional dimensions into a coherent structural framework. A hierarchical approach provides a means of organizing these diverse concerns according to their systemic roles rather than merely grouping them thematically.

Accordingly, the present study addresses platform social responsibility as a complex system of interdependent variables whose importance derives not only from their individual meaning but also from their position within a broader structure of influence and dependence. By focusing on hierarchical ordering, direct and indirect effects, driving and dependence power, and the reproducibility and stability of level assignments, the analysis seeks to clarify which elements constitute foundational forces, which serve as transmission mechanisms, and which primarily emerge as downstream consequences. Such an approach is particularly

appropriate for platform businesses because their social responsibilities are produced through interconnected technological, economic, legal, ethical, environmental, and stakeholder processes rather than through isolated corporate actions.

The aim of this study was to model the hierarchical structure of platform social responsibility using Interpretive Structural Modeling and to evaluate the reproducibility and stability of the identified levels through analysis of the direct, indirect, driving, and dependence relationships among the model variables.

2. Methods and Materials

This study employed a quantitative expert-based design using Interpretive Structural Modeling (ISM) to develop and examine the hierarchical structure of the dimensions and components of social responsibility in platform-based businesses. ISM is a systematic modeling technique designed to transform complex and insufficiently structured relationships among a set of interrelated elements into an organized multilevel structural model. Rather than examining isolated associations among variables, ISM determines how individual elements influence one another and identifies the hierarchical position of each element within the overall system. Accordingly, the methodological focus of the present study was exclusively on establishing the structural relationships among the predetermined components of platform social responsibility, determining their respective levels within the resulting hierarchy, and evaluating the reproducibility and structural stability of this level assignment. The units of analysis were therefore the components included in the ISM model and the directional relationships among them, while expert judgments constituted the empirical basis for determining these relationships. The study population consisted of academic experts, business professionals, and managers and specialists with relevant knowledge or practical experience in platform businesses, digital entrepreneurship, management, corporate or platform social responsibility, strategic management, technology management, and related areas. Because ISM depends on informed judgment rather than population-level statistical estimation, participants were selected through purposive judgmental sampling. Eligibility required at least five years of relevant academic, managerial, consulting, or professional experience and sufficient familiarity with the organizational and social implications of platform-based businesses. Particular attention was given to selecting participants capable of evaluating not merely whether two components were associated, but whether one component could reasonably be interpreted as facilitating, influencing, reinforcing, or structurally preceding another. Twenty experts were included in the modeling process. The group incorporated both academic and practitioner perspectives in order to reduce the likelihood that the resulting hierarchy would reflect only a theoretical or exclusively managerial interpretation of platform social responsibility. Diversity in professional background, educational specialization, and organizational experience was also considered during expert selection so that the pairwise judgments would reflect different dimensions of platform governance and social responsibility. The selected experts included university instructors and researchers as well as private-sector managers and professionals, predominantly with postgraduate qualifications in fields such as business administration, strategic management, technology management, entrepreneurship, marketing, human resource management, public administration, executive management, finance, and project management. Participation continued until an adequate panel of knowledgeable experts was established for the structural modeling procedure. The final hierarchical model was subsequently subjected to expert reconsideration and structural consistency assessment to determine whether the allocation of components to different levels was sufficiently stable and reproducible rather than being dependent on isolated or idiosyncratic judgments.

Data were collected using an ISM pairwise relationship instrument centered on the Structural Self-Interaction Matrix (SSIM). The instrument contained the complete set of platform social responsibility components to be incorporated into the structural model and presented them to the expert panel in pairwise form. For every pair of components, experts were required to determine the direction of the contextual relationship between them. The central question underlying each judgment was whether one component contributed to, influenced, enabled, strengthened, or structurally preceded the other component within the system of platform social responsibility. The instrument was designed to capture directional rather than merely correlational relationships because the purpose of ISM is to identify the underlying structural hierarchy of a system. Expert responses were subsequently represented through the conventional ISM relational symbols. A directional relationship from component i to component j was distinguished from a directional relationship from j to i, a

reciprocal relationship between the two components, and the absence of a meaningful direct relationship. These judgments constituted the entries of the Structural Self-Interaction Matrix. Before completing the matrix, participants received standardized instructions concerning the meaning of each relational category and the criterion to be used in deciding whether one component influenced another. This procedure was intended to minimize variation caused by inconsistent interpretation of the relationship question. Where judgments were uncertain or differed among experts, the relationships were reviewed using expert consensus rather than being determined by a simple mechanical interpretation of individual responses. The emphasis was placed on establishing a logically defensible collective representation of the system. The resulting SSIM therefore represented the aggregated expert judgment concerning the direction of relationships among all components included in the model. To strengthen content and structural validity, the wording of the pairwise relationship criterion and the preliminary matrix structure were reviewed for clarity and consistency with the conceptual domain of platform social responsibility. Following the construction of the hierarchical model, the resulting levels and directional paths were returned to expert reviewers to assess whether the model accurately represented the perceived structure of relationships among the components. The stability assessment also relied on reconsideration of critical relationships and level assignments, allowing the study to distinguish robust hierarchical placements from those potentially sensitive to variation in expert judgment. This procedure was particularly relevant to the objective of examining the reproducibility and stability of the level structure, because a component was regarded as structurally robust when its hierarchical position remained substantively unchanged after the relational judgments and resulting model were reassessed.

The data were analyzed using the standard sequential procedure of Interpretive Structural Modeling. Initially, the pairwise expert judgments were organized in the Structural Self-Interaction Matrix. The SSIM was then transformed into an Initial Reachability Matrix by converting the directional relational symbols into binary values. For each pair of components *i* and *j*, the appropriate cells of the matrix were coded as 1 or 0 according to the direction of the relationship established by the experts. A value of 1 indicated the existence of a structural relationship in the specified direction, whereas a value of 0 indicated that the corresponding directional relationship was not established. The Initial Reachability Matrix was subsequently examined according to the principle of transitivity, which is a fundamental assumption of ISM. Under this principle, when component A influences component B and component B influences component C, component A is considered to have an indirect structural relationship with component C unless substantive considerations provide a reason to reject that inference. Incorporation of these transitive relationships produced the Final Reachability Matrix, which represented both direct and logically inferred pathways among the components. The Final Reachability Matrix was then used for level partitioning. For each component, a reachability set and an antecedent set were constructed. The reachability set contained the component itself and all other components that it could reach, whereas the antecedent set contained the component itself and all components capable of reaching it. The intersection of these two sets was calculated for every component. A component for which the reachability set was identical to its intersection set was assigned to the highest available level in that iteration. After assigning the corresponding component or components to a level, they were removed from subsequent iterations and the procedure was repeated until every component had been allocated to a hierarchical level. This iterative partitioning process generated the multilevel architecture of platform social responsibility and distinguished the more foundational or driving components from the more dependent or outcome-proximal components. The final ISM digraph was constructed from the Final Reachability Matrix and the identified hierarchical levels. Components were represented as nodes and significant directional relationships as connecting paths, while redundant transitive links were removed where appropriate to improve interpretability without altering the structural logic of the model.

The driving and dependence properties of the components were additionally examined through MICMAC analysis using the Final Reachability Matrix. For each component, driving power was calculated from the total number of components, including itself, that it could influence, whereas dependence power was determined from the number of components capable of influencing it. The resulting driving–dependence pattern was used to classify the components into autonomous, dependent, linkage, and independent or driving categories. Autonomous components were characterized by relatively weak driving and dependence power, dependent components by weak driving but strong dependence, linkage components by simultaneously strong driving and

dependence, and independent components by strong driving power combined with relatively limited dependence. MICMAC analysis was used as a complementary structural diagnostic rather than as a separate methodological phase, because its purpose was to clarify the systemic role of the same components modeled through ISM and to assess whether their hierarchical position was compatible with their driving and dependence characteristics.

Given the specific emphasis of the study on reproducibility and stability, the hierarchical solution was not interpreted solely on the basis of a single matrix construction. Structural stability was assessed by examining whether the principal level assignments and directional relationships remained unchanged when the expert judgments were reconsidered and the reachability and level-partitioning procedures were reapplied. Particular attention was paid to components whose level membership could potentially shift as a consequence of marginal changes in pairwise judgments. The reproducibility of the model was evaluated in terms of the consistency with which the same or substantively equivalent hierarchical organization could be reconstructed from the validated expert relationship matrix. Components retaining their position across the repeated structural evaluation were interpreted as having stable level membership, whereas any component displaying sensitivity to alterations in the relational matrix was treated as structurally less stable and interpreted with greater caution. Logical consistency between hierarchical level, driving power, dependence power, and the direction of the major structural pathways was also examined as an additional check on the coherence of the model. The finalized ISM structure therefore represented not merely a graphical ordering of platform social responsibility components, but a systematically derived hierarchy whose relational logic, level allocation, driving–dependence properties, and stability under reassessment were explicitly evaluated. MICMAC software was used to support the analysis of driving and dependence relationships and the structural classification of the components, while the ISM matrices and iterative level-partitioning procedure provided the basis for constructing and validating the final hierarchical model.

3. Findings and Results

The Interpretive Structural Modeling analysis was conducted to determine the hierarchical configuration, driving–dependence pattern, and direct and indirect interrelationships among the components of social responsibility in platform-based businesses. The modeling framework incorporated six broad domains represented by 30 variables. Pairwise relationships were assessed on a scale ranging from 0, indicating no influence, to 4, indicating a very strong influence, and the resulting structural relationships were analyzed using ISM and MICMAC procedures. The initial set of variables is presented in Table 1.

Table 1

Variables Included in the Interpretive Structural Modeling of Platform Social Responsibility

Code	Variable	Dimension
V1	Production and Employment Creation	Economic
V2	Profitability and Financial Sustainability	Economic
V3	Innovation and Economic Development	Economic
V4	Responsibility toward Shareholders	Economic
V5	Cost Efficiency	Economic
V6	Energy Consumption	Environmental
V7	Pollution Reduction	Environmental
V8	Waste Management	Environmental
V9	Green Products	Environmental
V10	Environmental Protection Projects	Environmental
V11	Transparency and Honesty	Legal–Ethical
V12	Respect for Human Rights	Legal–Ethical
V13	Compliance with Laws and Regulations	Legal–Ethical
V14	Anti-Corruption and Anti-Bribery	Legal–Ethical
V15	Workplace Justice	Legal–Ethical
V16	Access and Inclusion	Platform Social Responsibility

V17	Social Participation	Platform Social Responsibility
V18	Privacy Protection	Platform Social Responsibility
V19	Algorithmic Transparency	Platform Social Responsibility
V20	Content Protection	Platform Social Responsibility
V21	Scalability	Platform Services
V22	Business Model	Platform Services
V23	Interactions and Networks	Platform Services
V24	Technology and Innovation	Platform Services
V25	Service Quality	Platform Services
V26	Technological Change	Contextual Influences
V27	Cultural Transformation	Contextual Influences
V28	Social Pressures	Contextual Influences
V29	Political–Legal Conditions	Contextual Influences
V30	Socioeconomic Consequences	Contextual Influences

As shown in Table 1, the ISM framework consisted of 30 variables distributed across six major domains. The economic dimension comprised production and employment creation, profitability and financial sustainability, innovation and economic development, shareholder responsibility, and cost efficiency. The environmental dimension covered energy consumption, pollution reduction, waste management, green products, and environmental protection projects. The legal–ethical dimension incorporated transparency and honesty, human rights, legal compliance, anti-corruption, and workplace justice. Variables specifically associated with platform social responsibility included access and inclusion, social participation, privacy protection, algorithmic transparency, and content protection, while the platform-services dimension encompassed scalability, the business model, interactions and networks, technology and innovation, and service quality. Finally, technological change, cultural transformation, social pressures, political–legal conditions, and socioeconomic consequences represented the contextual domain. This comprehensive set of variables enabled the ISM procedure to capture both internally controllable characteristics of platform businesses and broader contextual forces capable of shaping their social responsibility architecture.

Table 2

Level Partitioning of Platform Social Responsibility Variables in the ISM Model

ISM Level	Variables
Level 1 – Most Dependent	V25 Service Quality; V20 Content Protection; V10 Environmental Protection Projects
Level 2	V18 Privacy Protection; V15 Workplace Justice; V9 Green Products; V24 Technology and Innovation
Level 3	V23 Interactions and Networks; V17 Social Participation; V7 Pollution Reduction; V5 Cost Efficiency
Level 4	V14 Anti-Corruption and Anti-Bribery; V12 Respect for Human Rights; V4 Responsibility toward Shareholders; V3 Innovation and Economic Development
Level 5	V13 Compliance with Laws and Regulations; V22 Business Model; V2 Profitability and Financial Sustainability; V6 Energy Consumption
Level 6	V11 Transparency and Honesty; V21 Scalability; V19 Algorithmic Transparency; V8 Waste Management
Level 7	V1 Production and Employment Creation; V26 Technological Change; V27 Cultural Transformation
Level 8 – Most Foundational	V28 Social Pressures; V29 Political–Legal Conditions; V30 Socioeconomic Consequences; V16 Access and Inclusion

The level-partitioning results revealed an eight-level hierarchical structure. At the most foundational level, social pressures, political–legal conditions, socioeconomic consequences, and access and inclusion formed the structural base of the model, indicating that these variables exerted comparatively strong upstream influence on other elements. Technological change, cultural transformation, and production and employment creation occupied Level 7 and therefore represented another set of relatively deep driving forces. Transparency and honesty, scalability, algorithmic transparency, and waste management were located at Level 6, while legal compliance, the business

model, financial sustainability, and energy consumption occupied Level 5. Intermediate levels contained anti-corruption, human rights, shareholder responsibility, innovation and economic development, interactions and networks, social participation, pollution reduction, and cost efficiency. At the upper levels, privacy protection, workplace justice, green products, and technology and innovation appeared as relatively dependent variables, whereas service quality, content protection, and environmental protection projects occupied Level 1 and were therefore the most dependent elements of the overall structure. The hierarchy indicates that visible performance-related outcomes of social responsibility tend to emerge from deeper institutional, contextual, economic, and governance-related conditions.

For the final ISM–MICMAC model, 22 variables representing the principal dimensions and consequences of platform social responsibility were examined simultaneously. These included 12 consequences of social responsibility implementation and 10 variables representing the principal economic, environmental, legal–ethical, platform-responsibility, and platform-service dimensions. Table 3 presents the direct influence, direct dependence, indirect influence, and indirect dependence values for all 22 variables.

Table 3

Direct and Indirect Influence and Dependence of the Dimensions and Consequences of Platform Social Responsibility

Rank	Variable	Direct Influence	Direct Dependence	Indirect Influence	Indirect Dependence
1	Var21 – Business Model	584	584	576	576
2	Var22 – Technology and Innovation	584	573	575	567
3	Var17 – Anti-Corruption and Anti-Bribery	529	573	526	567
4	Var12 – Improved Environmental Conditions	507	386	499	393
5	Var11 – Improved Employee Performance	485	507	489	511
6	Var05 – Improved Public and Media Relations	474	485	480	486
7	Var07 – Increased Reputational Risks	474	408	474	408
8	Var10 – Improved Marketing	474	474	481	481
9	Var18 – Compliance with Laws and Regulations	474	474	478	479
10	Var03 – Increased Investment Attraction	452	463	454	469
11	Var02 – Increased Customer Loyalty	441	419	447	423
12	Var08 – Creation of Higher Expectations	441	452	444	453
13	Var13 – Production and Employment Creation	441	463	439	463
14	Var14 – Cost Efficiency	441	463	437	449
15	Var20 – Access and Inclusion	441	441	439	439
16	Var04 – Increased Employee Satisfaction	430	441	437	450
17	Var09 – Improved Financial Performance	430	463	428	464
18	Var15 – Energy Consumption	419	386	409	380
19	Var01 – Improved Brand Image	386	430	394	425
20	Var19 – Content Protection	386	386	391	391
21	Var06 – Additional Costs	375	342	372	344
22	Var16 – Waste Management	320	375	320	371

Table 3 demonstrates that the business model (Var21) and technology and innovation (Var22) occupied the strongest positions in terms of direct influence. Both recorded a direct influence score of 584, while their indirect influence values remained similarly high at 576 and 575, respectively. The limited decline between their direct and indirect values suggests that their structural importance was not confined to immediate connections with other factors; rather, their influence was preserved throughout the wider network of relationships. This finding places the configuration of the platform business model and its technological capability near the center of the structural architecture of platform social responsibility. In practical structural terms, changes in these two variables can propagate through multiple pathways and consequently affect numerous responsibility-related consequences.

Anti-corruption and anti-bribery (Var17) also displayed a prominent structural position, with a direct influence value

of 529 and an indirect influence value of 526. Its direct and indirect dependence scores were even higher, at 573 and 567, respectively. This combination indicates that anti-corruption was simultaneously influential and strongly interconnected with other variables. Rather than representing a purely independent driver, it functioned as a highly interactive or linkage-type factor whose status was shaped by other elements while also transmitting substantial influence throughout the model. Compliance with laws and regulations (Var18) exhibited a similarly balanced pattern, with direct influence and dependence values of 474 and indirect values of 478 and 479. These results emphasize the systemic character of the legal–ethical dimension: legal and ethical mechanisms were embedded within reciprocal relationships rather than operating as isolated antecedents.

Among the consequence-related variables, improved environmental conditions (Var12) showed particularly strong influence, with direct and indirect influence values of 507 and 499, respectively, compared with direct and indirect dependence values of 386 and 393. This asymmetry suggests that environmental improvement, once established within the responsibility architecture, may itself reinforce other favorable organizational and social outcomes. Improved employee performance (Var11) also occupied an important position, recording direct and indirect influence values of 485 and 489 and dependence values of 507 and 511. Improved public and media relations (Var05) and improved marketing (Var10) demonstrated similarly substantial values across both influence and dependence dimensions. These patterns indicate that several consequences of platform social responsibility should not be interpreted as terminal outcomes only; instead, they may become reinforcing mechanisms that further affect other components of the responsibility system.

A group of variables occupied intermediate positions with comparatively balanced influence and dependence. Increased investment attraction (Var03), customer loyalty (Var02), higher stakeholder expectations (Var08), production and employment creation (Var13), cost efficiency (Var14), and access and inclusion (Var20) all fell within this structural range. For example, access and inclusion recorded identical direct influence and dependence scores of 441 and identical indirect scores of 439, indicating a strongly reciprocal structural position. Production and employment creation showed a direct influence score of 441 relative to a dependence score of 463, while the corresponding indirect values were 439 and 463. Cost efficiency displayed a comparable pattern. Such results suggest that these factors operate principally as intermediate transmission mechanisms: they are affected by foundational forces but simultaneously contribute to subsequent consequences and organizational responses.

The lowest influence scores were observed for waste management (Var16), additional costs (Var06), content protection (Var19), and improved brand image (Var01). Waste management had the lowest direct and indirect influence values, both equal to 320, while its direct and indirect dependence values were 375 and 371. Additional costs recorded direct and indirect influence scores of 375 and 372, respectively. These comparatively low influence values do not imply substantive unimportance; instead, within the logic of ISM they indicate that such variables function more as downstream or structurally dependent manifestations of the broader responsibility system. Similarly, improved brand image displayed lower influence than many strategic and governance factors, consistent with its interpretation as a consequence that emerges from multiple preceding responsibility-related practices rather than serving as a primary structural driver.

Taken together, the direct and indirect results reveal a system characterized by considerable structural interdependence. The relatively small differences between direct and indirect scores for many variables indicate that the influence patterns remained broadly stable after indirect pathways were incorporated into the analysis. This stability provides support for the reproducibility of the hierarchical structure because the principal influential variables retained their relative importance after the network was expanded beyond immediate relationships. In particular, the persistent prominence of the business model, technology and innovation, anti-corruption, legal compliance, and selected performance-related outcomes demonstrates that the final hierarchy was not produced merely by isolated pairwise relationships. Instead, it reflected a broader network structure in which foundational platform characteristics, governance mechanisms, and organizational consequences interacted through both direct and indirect pathways.

Figure 1

Driving and Dependence Classification of the Variables Representing the Dimensions and Consequences of Corporate Social Responsibility

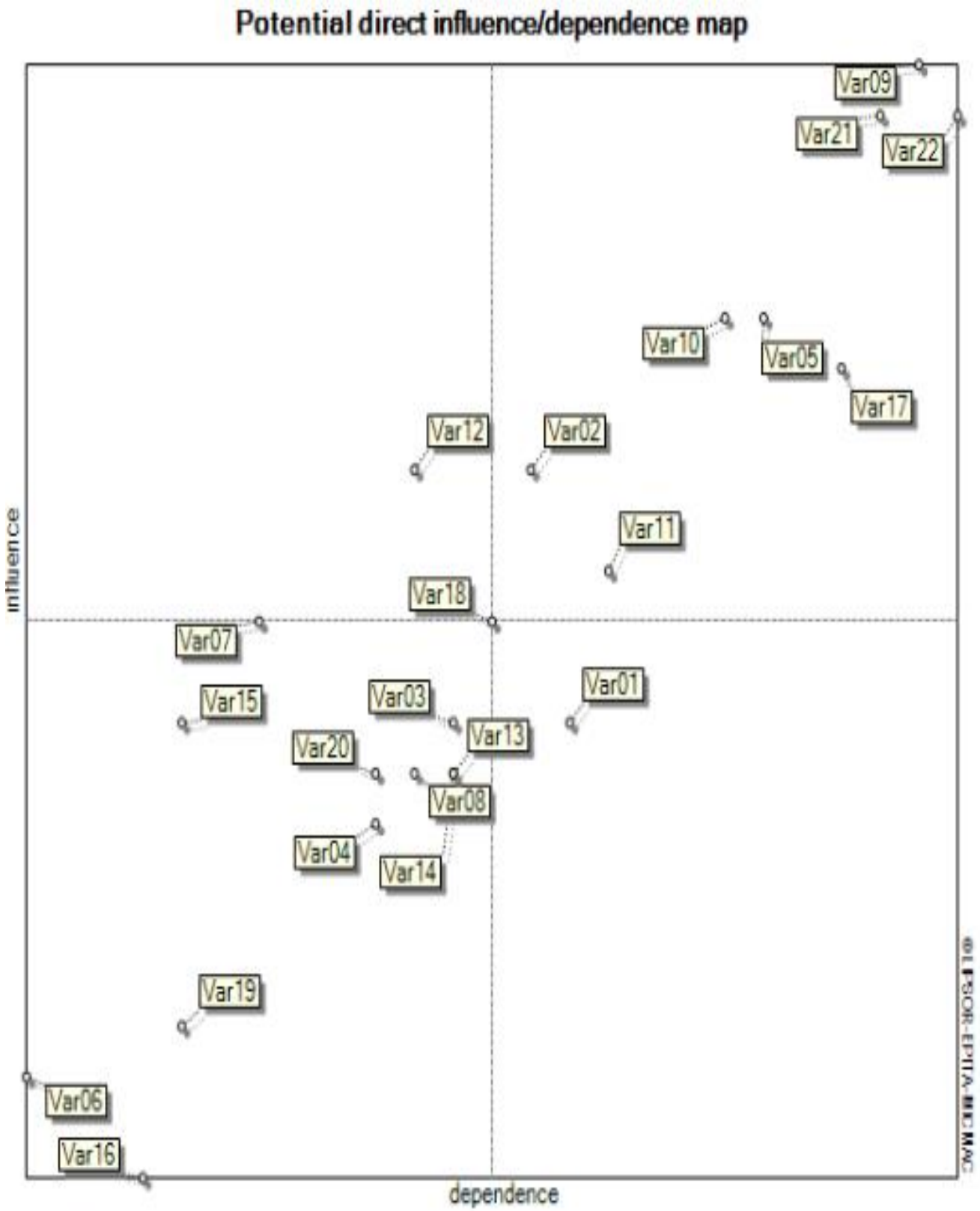
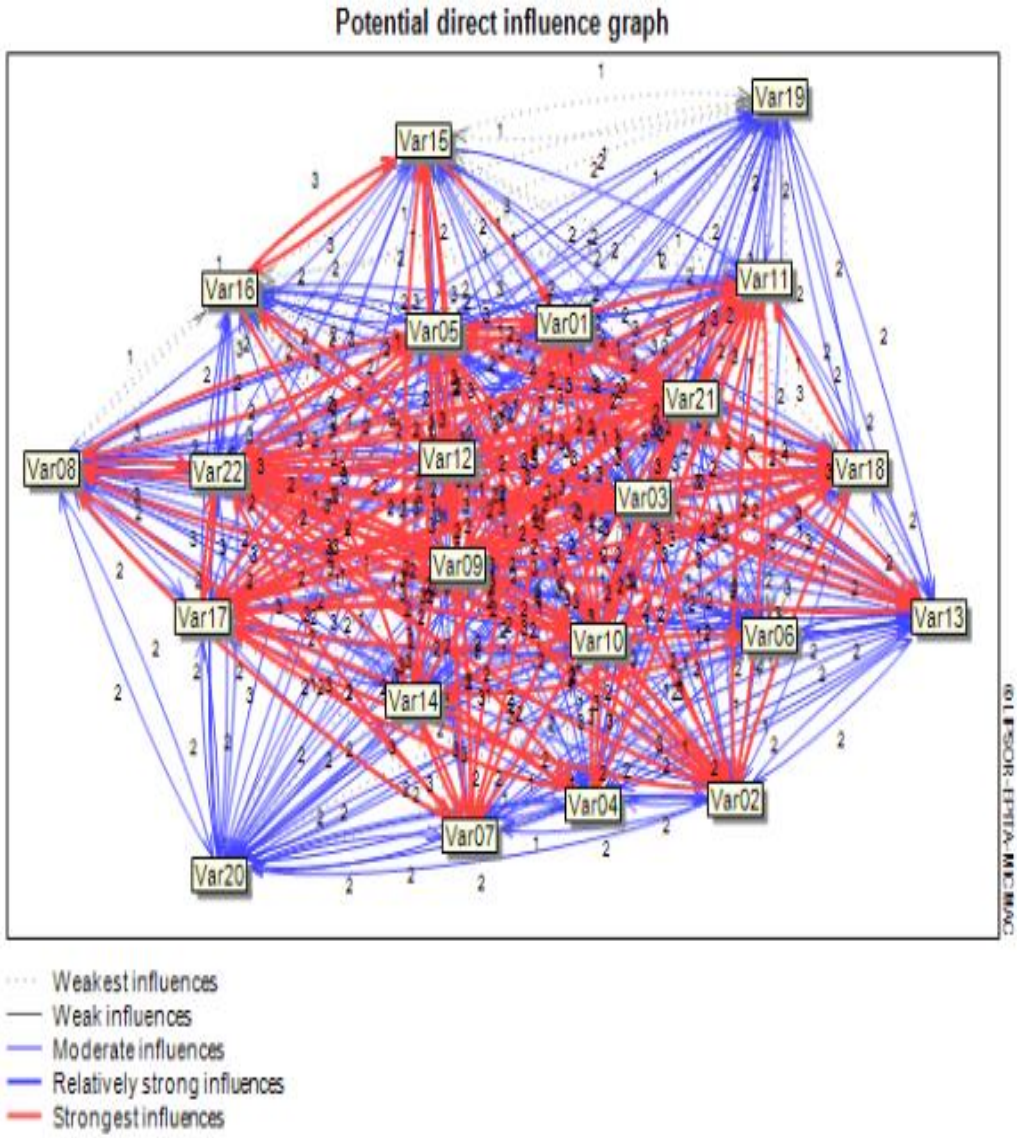


Figure 2

Influence Structure among the Variables Representing the Dimensions and Consequences of Corporate Social Responsibility



The MICMAC driving–dependence map illustrates the relative independence and dependence of the 22 variables and provides a complementary interpretation of their positions within the ISM structure.

The final influence map presents the structural relationships among the 22 factors and illustrates the direction and relative position of their influence within the overall hierarchical system of platform social responsibility.

4. Discussion and Conclusion

The present study used Interpretive Structural Modeling to clarify the hierarchical architecture of platform social responsibility and to determine the relative positions of its economic, environmental, legal–ethical, platform-specific, service-related, and contextual components. The findings revealed an eight-level structure in which social pressures, political–legal conditions, socioeconomic consequences, and access and inclusion occupied the most foundational level, whereas service quality, content protection, and environmental protection projects appeared at the most dependent level. The intermediate layers contained technological, economic, governance, and platform-service variables that linked these foundational forces to more visible social responsibility outcomes. The final MICMAC-based analysis further showed that the business model and technology and innovation possessed the strongest direct and indirect influence within the final 22-variable structure, while anti-corruption and anti-bribery also occupied a highly

interconnected position. At the same time, variables such as waste management, additional costs, content protection, and brand image exhibited comparatively lower driving power and were more characteristic of downstream or dependent outcomes. Taken together, these results indicate that platform social responsibility is not a flat collection of parallel practices but a layered system in which contextual conditions and organizational architecture shape governance mechanisms, operational practices, and ultimately observable social and economic consequences.

One of the most important findings was the foundational position of social pressures and political–legal conditions. This result suggests that platform responsibility is strongly conditioned by the external institutional environment and by expectations generated by users, communities, regulators, and wider society. Such a finding is consistent with the growing recognition that digital platforms cannot be understood as neutral technological intermediaries whose responsibilities are limited to contractual relationships. Rather, their gatekeeping capacities give them a significant role in governing access, visibility, participation, and information flows, thereby exposing them to broader expectations of legitimacy and accountability (Gilbert et al., 2024). The foundational role of political–legal conditions also corresponds with evidence that socially responsible platform behavior increasingly depends on formal legal frameworks concerning rights, content governance, consumer protection, and platform accountability (Bashir, 2024). In this sense, legal and political environments do not simply constrain individual platform practices; they provide the structural conditions within which the entire system of responsibility is developed. The finding that social pressure similarly occupied the deepest level reinforces the view that platform responsibility evolves partly in response to stakeholder scrutiny and public expectations, particularly because digital infrastructures enable rapid visibility of organizational actions and failures.

Access and inclusion also appeared at the foundational level, which is theoretically important because access is sometimes treated as a social outcome rather than a structural antecedent. The current findings suggest instead that inclusion can function as a basic design principle affecting numerous other responsibility dimensions. In a platform environment, access determines who can participate, who benefits from platform-mediated services, and whose interests are represented within the ecosystem. This interpretation is compatible with broader work on digital responsibility that emphasizes the need to integrate inclusion, stakeholder participation, technology governance, and organizational responsibility rather than treating them as independent concerns (Trittin-Ulbrich et al., 2025). It also corresponds with the ecosystem perspective proposed for corporate digital responsibility, according to which responsible service provision depends on the interactions among firms, users, technological partners, regulators, and other stakeholders (Wirtz et al., 2023). From this perspective, inclusion is not merely an ethical add-on but an architectural condition that shapes the operation of the ecosystem itself.

The placement of technological change and cultural transformation at the next foundational level further demonstrates that platform responsibility is highly sensitive to its external environment. Technological change can alter available business models, data-processing capacities, algorithmic practices, security mechanisms, and stakeholder expectations, while cultural transformation can reshape norms concerning privacy, transparency, fairness, sustainability, and participation. These variables therefore function as dynamic contextual forces that continuously redefine what responsible platform conduct means. The importance of technological change is reinforced by research showing that digital platforms may influence the implementation of corporate social responsibility through their technological capabilities and their capacity to affect environmental and public-health outcomes (Wang et al., 2024). Similarly, studies of platform-based CSR during crisis conditions have shown that technological adaptability can become an important mechanism for responding to rapidly changing societal needs (Zhang et al., 2023). The present findings therefore suggest that responsibility systems in platform businesses must be interpreted dynamically, because the hierarchy of responsibility itself may evolve as technologies and societal norms change.

The middle layers of the ISM hierarchy were dominated by variables related to governance, business configuration, economic viability, transparency, and operational capacity. Compliance with laws and regulations, the business model, profitability and financial sustainability, energy consumption, transparency and honesty, scalability, algorithmic transparency, and waste management all occupied intermediate structural positions. Their placement indicates that these variables transmit the effects of foundational contextual pressures into more specific social responsibility practices and outcomes. This finding is particularly meaningful for the business model because the final direct and indirect effects analysis identified it as one

of the two most influential variables in the overall structure. Research on nonprofit and socially oriented platform models has demonstrated that the platform business model itself can be designed in ways that prioritize social benefit rather than merely maximizing commercial exchange (Mancha et al., 2021). Thus, the current findings support the proposition that responsibility is partly embedded in the logic of value creation, value distribution, and stakeholder coordination established by the business model. If responsibility is addressed only through isolated CSR initiatives without altering the underlying architecture of the platform business, its systemic effects may remain limited.

Technology and innovation were similarly identified as dominant drivers, demonstrating the central role of technological design in shaping platform responsibility. In digital businesses, technological decisions influence privacy, access, algorithmic decision making, content visibility, environmental efficiency, service quality, and stakeholder interactions simultaneously. The strong direct and indirect influence of technology and innovation therefore reflects its cross-cutting role throughout the model. This finding is consistent with the broader corporate digital responsibility literature, which argues that organizational responsibility in digital environments is inseparable from information systems, data infrastructures, algorithmic technologies, and digital service design (Trittin-Ulbrich et al., 2025; Wirtz et al., 2023). The result also aligns with studies examining algorithmic responsibility and the management of security-related challenges, which highlight that platform technologies can create consequences that extend beyond conventional firm-level decision making (Mohammadi & Sotoudeh, 2023). In this respect, technological innovation should not be interpreted as inherently responsible or irresponsible; rather, its structural importance means that the governance principles embedded in technological systems can influence numerous downstream CSR outcomes.

The strong role of anti-corruption and anti-bribery was another notable finding. Although this variable did not occupy the deepest level of the initial hierarchy, it displayed high direct and indirect influence and high dependence in the final structural analysis, indicating the characteristics of a linkage variable. Such a position implies that anti-corruption practices are both affected by other institutional and organizational factors and capable of transmitting effects to other parts of the system. This interpretation is consistent with the broader legal and ethical responsibility of platforms, particularly as platform businesses often operate across multiple jurisdictions, coordinate large networks of third parties, and manage complex commercial and informational relationships. Legal frameworks for socially responsible platforms emphasize that formal compliance alone is insufficient when platform activities generate broader concerns regarding fairness, accountability, and stakeholder protection (Bashir, 2024). Similarly, the moral legitimacy of platforms depends partly on whether they exercise their gatekeeping authority in transparent and accountable ways (Gilbert et al., 2024). Anti-corruption therefore appears to operate as an important bridge between formal governance arrangements and stakeholder trust.

Transparency-related findings are also consistent with previous studies. Transparency and honesty appeared in an intermediate but relatively foundational level, while algorithmic transparency occupied the same structural layer. This result suggests that transparency acts as an enabling mechanism through which responsibility-related expectations are translated into observable governance practices. The importance of transparency has long been emphasized in research on CSR reporting systems, where digital reporting platforms have been shown to facilitate accountability by improving the accessibility and traceability of corporate responsibility information (Watts, 2015). More recent evidence indicates that social media interactions can also affect the quality of corporate social responsibility disclosure, suggesting that platform-based information exchange can influence how firms communicate and substantiate their responsibility practices (Niu et al., 2025). The present structural findings extend these observations by suggesting that transparency does not function merely as a reporting outcome; rather, it occupies an intermediate systemic position capable of connecting institutional demands with multiple organizational consequences.

The results concerning environmental variables revealed a differentiated pattern. Energy consumption and waste management appeared in relatively deeper levels of the hierarchy, whereas pollution reduction, green products, and environmental protection projects were positioned closer to the dependent end of the structure. This ordering suggests that resource-use practices and operational environmental management may serve as antecedent conditions for more visible environmental outcomes. Environmental protection projects, in particular, appeared at the most dependent level, indicating that such initiatives may depend on more fundamental economic, technological, regulatory, and governance capabilities. This finding is compatible with

research demonstrating that digital platforms can affect environmental sustainability and public health through the broader configuration of corporate responsibility practices (Wang et al., 2024). It also aligns with evidence that CSR information transparency can influence green consumption on digital platforms, showing that environmental responsibility is shaped through interactions among organizational behavior, information systems, and stakeholder decisions (Fu et al., 2023). The current findings therefore reinforce the need to distinguish between foundational environmental management capabilities and externally visible environmental programs.

The upper levels of the hierarchy contained service quality, content protection, privacy protection, workplace justice, green products, and technology-related outcomes, indicating that these variables are strongly affected by conditions established at deeper levels. The dependence of content protection and service quality is particularly important because both are frequently interpreted as core platform responsibilities. The ISM structure does not diminish their importance; rather, it indicates that successful performance in these areas may require prior development of legal, technological, organizational, and economic capacities. Content governance, for example, depends on platform technology, algorithmic transparency, regulatory expectations, business incentives, and the institutional legitimacy of the rules through which information is managed. The importance of platform gatekeeping responsibilities has been emphasized in prior scholarship, which argues that platforms must justify how they exercise authority over content, participation, and access (Gilbert et al., 2024). Similarly, legal analyses of socially responsible platforms underline the need for governance structures capable of balancing freedom of expression, accountability, and user protection (Bashir, 2024).

The final analysis of the 22 variables further indicated that several apparent consequences of CSR may themselves become influential components within the system. Improved environmental conditions, improved employee performance, improved public and media relations, and improved marketing all displayed substantial direct and indirect influence values. This finding suggests the existence of reinforcing feedback effects. Once social responsibility practices generate positive organizational outcomes, those outcomes may strengthen stakeholder engagement, resource availability, legitimacy, and managerial commitment, thereby affecting other parts of the system. The same logic can be applied to information-related feedback. Research has shown that greater CSR transparency can influence consumption behavior (Fu et al., 2023), while social media interactions may improve the quality of CSR disclosure (Niu et al., 2025). These reciprocal processes support the interpretation of platform social responsibility as a dynamic system rather than a simple sequence from antecedents to outcomes.

The relatively balanced direct and indirect influence values observed for many variables provide additional evidence of structural stability. The business model, technology and innovation, anti-corruption, legal compliance, and several consequence-related variables retained similar positions when indirect pathways were considered. This indicates that their importance was not dependent solely on immediate pairwise relationships. Such stability is particularly relevant to the central concern of the present study, namely the reproducibility and sustainability of hierarchical positioning. From a systems perspective, robust structures tend to retain their principal organizing features even when indirect connectivity is incorporated. Graph-theoretical approaches to strongly connected structures similarly show that complex networks may contain components whose importance derives from multiple interconnected pathways rather than a single direct link (Tarjan & Zwick, 2022). The consistency of the current results therefore supports the interpretation that the identified hierarchy captures enduring structural relationships rather than isolated expert judgments.

More broadly, the findings complement prior research examining the antecedents and consequences of corporate social responsibility in platform-based businesses. Meta-analytic evidence has shown that platform CSR is shaped by multiple antecedents and produces diverse economic, reputational, organizational, and social consequences (Tavana et al., 2025). The present study adds a structural layer to that evidence by showing that these factors are not positioned equivalently within the system. Some function as deep drivers, others as linkage variables, and others as dependent manifestations. This hierarchical distinction is theoretically valuable because it helps explain why similar CSR initiatives may generate different outcomes across platforms. A platform operating under strong institutional support, inclusive design, transparent governance, and technologically responsible business architecture may be better positioned to generate stable downstream outcomes than a platform that focuses primarily on visible CSR initiatives without developing these foundational conditions.

The findings should nevertheless be interpreted in light of several limitations. First, the ISM structure was derived from expert judgments, and although systematic procedures were used to establish pairwise relationships and evaluate structural stability, expert-based modeling inevitably contains an interpretive component. The number and professional composition of experts may also influence the resulting hierarchy. Second, ISM identifies structural direction and hierarchical position but does not estimate causal effect sizes in the same way as longitudinal or experimental methods. Third, the final model necessarily simplifies a highly dynamic platform ecosystem into a bounded set of variables, and some potentially relevant factors may not have been represented. Finally, the model captures the structural logic of the selected variables at a particular analytical stage and may require reconsideration as technologies, regulations, platform business models, and social expectations evolve.

Future research should examine the reproducibility of the present hierarchy across different platform sectors, national contexts, and regulatory environments. Comparative studies could determine whether the same foundational variables emerge in e-commerce, social media, mobility, financial technology, online labor, health, and educational platforms. Researchers could also combine ISM with longitudinal data, structural equation modeling, network analysis, fuzzy MICMAC, DEMATEL, or Bayesian methods to examine the strength, uncertainty, and temporal evolution of the identified relationships. Repeated expert panels could be used to test the sensitivity of level assignments, while larger cross-national samples could establish whether business model architecture, technological innovation, legal conditions, and social pressure maintain similar structural positions across institutional settings. Future studies should also investigate feedback loops among CSR outcomes, particularly whether improvements in reputation, employee performance, environmental outcomes, and stakeholder engagement subsequently reinforce responsible platform governance.

For practice, platform managers should prioritize foundational and high-driving variables rather than allocating resources exclusively to visible CSR outcomes. Particular attention should be directed toward responsible business-model design, technological governance, legal compliance, anti-corruption mechanisms, transparency, inclusion, and responsiveness to political and social expectations because improvements in these areas are likely to influence several downstream outcomes simultaneously. Managers should also treat service quality, privacy, content protection, workplace justice, and environmental performance as system-level consequences that require coordination across technological, legal, operational, and strategic functions. Regular reassessment of the driving–dependence structure can help organizations identify changes in the relative importance of responsibility variables and adjust governance priorities accordingly. For policymakers, the findings indicate that regulation of platform responsibility should address the architecture of platform systems and not only their final outcomes, while platform organizations should integrate responsibility criteria directly into business-model design, technology development, and strategic decision-making.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

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