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Occupational Health and Safety Governance in Internal Outsourcing: A Systematic Review and an Integrative Sociotechnical Framework

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Abstract

Internal outsourcing has intensified organizational fragmentation and redistributed responsibilities for Occupational Health and Safety (OHS) across multiple employers, challenging conventional safety management approaches. This study aims to critically synthesize recent academic research on OHS governance in internal outsourcing arrangements and to develop an integrative explanatory framework grounded in safety science and production systems research. A systematic literature review was conducted following the SALSA protocol, covering peer-reviewed journal articles published between 2020 and 2025 in Scopus, Web of Science, and Google Scholar. After applying rigorous inclusion and exclusion criteria, 17 studies were retained and analyzed using thematic analysis. The synthesis indicates that legal compliance and formal OHS management systems alone are insufficient to explain variations in safety performance in internally outsourced environments. Instead, OHS outcomes emerge from interactions among governance arrangements, contractual mechanisms, human resource practices, procurement logics, and digital technologies. Building on these findings, the paper proposes an integrative sociotechnical framework that explains how safety performance is shaped by interorganizational coordination, power asymmetries, and decision-making structures in fragmented production systems. The study contributes to safety science by advancing a mechanism-based explanation of how OHS performance emerges in fragmented, multi-employer production systems and by articulating directional propositions for future empirical testing.

Keywords

Internal Outsourcing, Occupational Health and Safety, Safety Governance, Sociotechnical Systems, Multi-Employer Environments

1. Introduction

The expansion of in-company outsourcing has enabled organizations to restructure their production systems. In this study, in-company outsourcing is defined as an arrangement in which workers formally employed by service-provider organizations operate continuously within the physical premises of the contracting organization (client). This modality differs from external subcontracting (where services are delivered off-site) and from labor-only contracting (personnel leasing without integrated service management). This review encompasses variants of on-site specialized service outsourcing and industrial maintenance, excluding one-off supply contracts for materials or remote consultancy services. While international standards such as ISO 45001 have advanced the formalization of Occupational Health and Safety (OHS) management, their underlying assumptions remain largely anchored in organizational settings characterized by unitary authority, stable boundaries, and coherent lines of responsibility [1] [2]. In internally outsourced production systems, however, these assumptions are systematically violated. Decision-making authority, operational control, and exposure to occupational risks are distributed across multiple organizations with asymmetric power relations, fragmented accountability, and often conflicting economic incentives [3] [4].

From a safety science perspective, this misalignment raises critical epistemological limitations. Risk-based management frameworks tend to conceptualize hazards as objects that can be identified, assessed, and controlled within bounded organizational systems [5]. In fragmented production environments, by contrast, occupational risks are frequently displaced across contractual interfaces, procurement decisions, and interorganizational coordination failures, rather than eliminated at their source [6]. As a result, compliance with formal OHS management systems may coexist with persistent safety deficits, particularly among outsourced workers occupying structurally vulnerable positions within production hierarchies [3] [4].

Empirical research increasingly demonstrates that OHS performance in multi-employer settings is shaped less by the formal presence of management systems than by the quality of governance arrangements regulating how decisions about work organization, resource allocation, and risk control are made across organizational boundaries [7]. Yet, despite growing recognition of these dynamics, the literature remains analytically fragmented, offering limited integrative explanations of how governance mechanisms, contractual structures, human resource practices, and digital technologies interact to shape safety outcomes in internal outsourcing contexts [2] [8].

Against this backdrop, this study advances a critical synthesis of recent literature on OHS governance in internal outsourcing arrangements and proposes an integrative sociotechnical framework to explain how safety performance emerges within fragmented production systems. By conceptualizing safety as an emergent property of interdependent organizational and technical subsystems, the study aligns with contemporary safety science approaches that move beyond linear,

compliance-oriented models toward systemic and explanatory understandings of occupational risk [9].

Existing occupational health and safety (OHS) governance models predominantly assume organizational boundedness, hierarchical coherence, and centralized authority over risk controls. Such assumptions become analytically fragile in internally outsourced environments, where operational authority, economic incentives, and accountability mechanisms are structurally distributed across contractual interfaces. While prior research has documented safety challenges in subcontracting contexts, it has not sufficiently theorized how governance fragmentation reshapes risk production mechanisms. This study addresses that theoretical gap by conceptualizing OHS governance in internal outsourcing as a distributed sociotechnical system in which safety performance emerges from the configuration of contractual power asymmetries, coordination architectures, and cross-boundary control mechanisms.

2. Theoretical Background

The complexity of in-company outsourcing arrangements requires an analytical perspective capable of capturing the interaction between organizational structures, decision-making processes, and socio-technical conditions affecting safety performance. Prior research highlights that the implementation and effectiveness of OHS management systems are highly contextual and dependent on organizational, contractual, and institutional factors [2].

ISO 45001 adopts a dynamic view of OHS management, emphasizing the influence of internal and external contextual factors on organizational action [1]. However, in outsourced environments, the diffusion of responsibility and the coexistence of multiple management systems complicate oversight and coordination, often undermining the intended effects of standardization [4].

Empirical studies show that certification does not necessarily translate into improved safety practices unless embedded within strong governance arrangements and supported by consistent managerial commitment [7]. Differences in organizational cultures and management practices between client firms and contractors frequently result in fragmented decision-making, role ambiguity, and decoupling between formal safety systems and everyday work practices [4].

From a safety science perspective, these dynamics are closely linked to power relations and economic pressures inherent in outsourcing. Cost-driven procurement strategies and productivity targets tend to prioritize operational efficiency over safety, reinforcing asymmetries between contracting organizations and service providers [6]. Such conditions have been associated with persistent differences in accident rates between direct and outsourced workers, highlighting limitations in data integration and performance monitoring systems [4].

Recent research emphasizes the role of governance mechanisms capable of integrating OHS considerations across organizational boundaries. Integrated governance arrangements, supported by top management commitment, are identi-

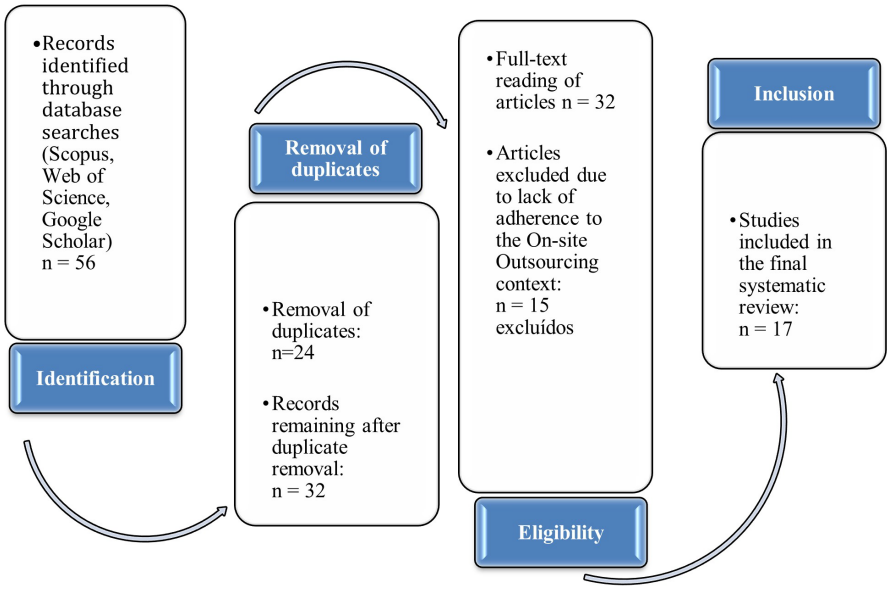
fied as critical for aligning safety objectives within fragmented production systems. Moreover, the integration of OHS management with human resource practices—such as training, participation, and safety climate initiatives—has been shown to improve engagement and safety outcomes, particularly in high-risk and high-turnover environments [3] [10].

Procurement practices represent another critical locus of decision-making affecting OHS performance. Studies indicate that contractor prequalification and selection processes often emphasize financial and technical criteria, with limited consideration of safety capabilities [11]. In response, the literature increasingly advocates for sustainable procurement models that embed OHS requirements throughout the contract lifecycle, from design and selection to monitoring and evaluation [12].

Digital technologies further influence OHS governance by enabling enhanced data integration, predictive risk analysis, and real-time monitoring across organizational boundaries. While such technologies offer significant potential to support proactive safety management, their adoption remains uneven and constrained by organizational, technical, and cultural barriers [13] [14]. From a critical political economy perspective, internal outsourcing institutionalizes patterns of risk displacement rather than risk elimination, as economic incentives and power asymmetries systematically externalize hazardous conditions toward structurally weaker actors within production networks.

3. Methodology

Figure 1 presents the flowchart of the identification, screening, eligibility, and inclusion process of the studies analyzed in the systematic literature review, following consolidated methodological guidelines.



Source: Developed by the author, based on the literature review.

Figure 1. Flowchart of the identification, screening, eligibility, and inclusion process.

This study adopts a qualitative systematic literature review (SLR) with an exploratory and analytical–synthetic orientation, consistent with safety science research aimed at explaining underlying mechanisms rather than quantifying effect sizes.

This study employed the SALSA framework (Grant *et al.*, 2009) [15] as a structured epistemological scaffold for conducting a theory-informed literature review. The selection of SALSA was methodologically deliberate, given its suitability for explanatory and mechanism-oriented syntheses in domains characterized by conceptual plurality, terminological dispersion, and heterogeneous empirical designs—conditions frequently observed within contemporary safety science research.

Rather than adopting a purely aggregative review protocol focused on effect-size consolidation, this study pursued an explanatory objective: to identify underlying generative mechanisms, theoretical tensions, and structural research gaps. In this context, SALSA offers a robust yet analytically flexible architecture, enabling systematic transparency while preserving interpretative depth and conceptual abstraction.

The review process followed four interdependent analytical stages:

- Search - A structured and replicable search strategy was operationalized through predefined Boolean expressions applied across selected high-impact academic databases. Search strings were iteratively refined through pilot testing to optimize sensitivity and specificity. Explicit delimitation parameters were established, including temporal boundaries, document typology, subject domains, and language criteria. This stage ensured procedural transparency and minimized selection bias.
- Appraisal - The screening phase adopted a multi-criteria evaluation protocol. Studies were assessed according to: methodological rigor, theoretical consistency, empirical robustness, and alignment with the explanatory scope of the research question.
- Quality appraisal did not rely solely on journal ranking metrics but incorporated substantive methodological assessment, thereby avoiding proxy-based bias. The inclusion/exclusion process was explicitly documented to ensure auditability and reproducibility.

Synthesis - Extracted data were systematically coded and organized into higher-order analytical categories through iterative comparative procedures. The synthesis phase moved beyond descriptive aggregation, employing thematic abstraction to identify convergent constructs, recurrent causal logics, and structural patterns across studies. Conceptual clustering enabled cross-study integration while preserving contextual nuance.

Analysis - The analytical stage involved abductive reasoning to interpret synthesized findings and uncover generative explanatory mechanisms. This phase emphasized: theoretical convergence and divergence mapping; identification of latent constructs; detection of epistemic blind spots; articulation of directional re-

search propositions.

The analytical objective was not limited to summarizing prior findings but to advance a refined conceptual architecture grounded in the cumulative evidence.

Literature searches were conducted in Scopus, Web of Science, and Google Scholar using combinations of keywords related to internal outsourcing, OHS management, contractor management, procurement, and digital technologies.

The review focused on peer-reviewed journal articles published between 2020 and 2025, a period marked by intensified outsourcing, digitalization, and renewed regulatory attention to psychosocial and organizational risks. Inclusion criteria comprised empirical and theoretical-empirical studies explicitly addressing OHS in outsourced or multi-employer production contexts. Normative guidelines, descriptive reports, and studies lacking an organizational or governance perspective were excluded.

The search strategy was structured to ensure transparency and reproducibility. Searches were conducted in the Scopus and Web of Science databases on December 16, 2025, using the following Boolean string: ("in-company outsourcing" OR "on-site outsourcing" OR "multi-employer" OR "subcontracting") AND ("occupational health and safety" OR "OHS" OR "safety governance" OR "contractor safety") AND ("procurement" OR "human resource management" OR "digital technologies" OR "governance mechanisms"). Equivalent syntaxes were adapted according to the specific requirements of each database.

Google Scholar was used as a complementary source to capture potentially relevant interdisciplinary studies. Screening was limited to the first 56 results ranked by relevance, after duplicate removal, ensuring systematic yet operationally feasible coverage. Records were initially assessed based on title and abstract prior to full-text review.

A structured critical appraisal stage was incorporated to examine the methodological robustness of the included studies. Each article was assessed based on four qualitative criteria: clarity of the research design; transparency of data sources and analytical procedures; empirical grounding of the conclusions; and analytical coherence between evidence and arguments.

Studies were not excluded solely on the basis of quality scores; however, the analytical weight assigned during the thematic synthesis considered the degree of methodological transparency and evidential depth. This approach aligns with explanatory qualitative reviews that prioritize the identification of mechanisms without compromising analytical rigor.

To enhance analytical rigor, the coding process followed an iterative comparative logic, in which emerging categories were continuously contrasted against prior studies. Inclusion decisions were based on explicit criteria of conceptual relevance, empirical robustness, and governance-level analytical depth. The abductive reasoning process enabled movement between empirical findings and theoretical abstraction, strengthening internal validity and theoretical coherence.

Seventeen studies met the final inclusion criteria and were incorporated into

the analytical synthesis. Although numerically limited, the corpus reflects a highly delimited structural phenomenon: on-site internal outsourcing arrangements involving shared operational environments. The objective was theoretical saturation rather than quantitative representativeness. Saturation was considered achieved when additional studies no longer introduced novel governance mechanisms, structural variables, or explanatory patterns. This approach is consistent with theory-building reviews in safety science, where conceptual depth and explanatory refinement are prioritized over numerical aggregation.

To enhance analytical rigor and internal validity, the review followed an iterative comparative coding process. Emerging categories were continuously contrasted across studies to identify convergent and divergent governance mechanisms. Inclusion decisions were guided by explicit criteria of conceptual relevance, empirical robustness, and governance-level analytical contribution. The abductive analytical strategy enabled recursive movement between empirical observations and theoretical abstraction, strengthening explanatory coherence and minimizing interpretive bias.

4. Results and Discussion

Based on the thematic analysis of the selected studies, the results were organized into five central axes, as presented in Table 1. This table synthesizes the key findings, representative authors, and implications for Occupational Health and Safety management within in-company outsourcing contracts.

Table 1. Thematic axes, central findings, and literature contributions (2020-2025).

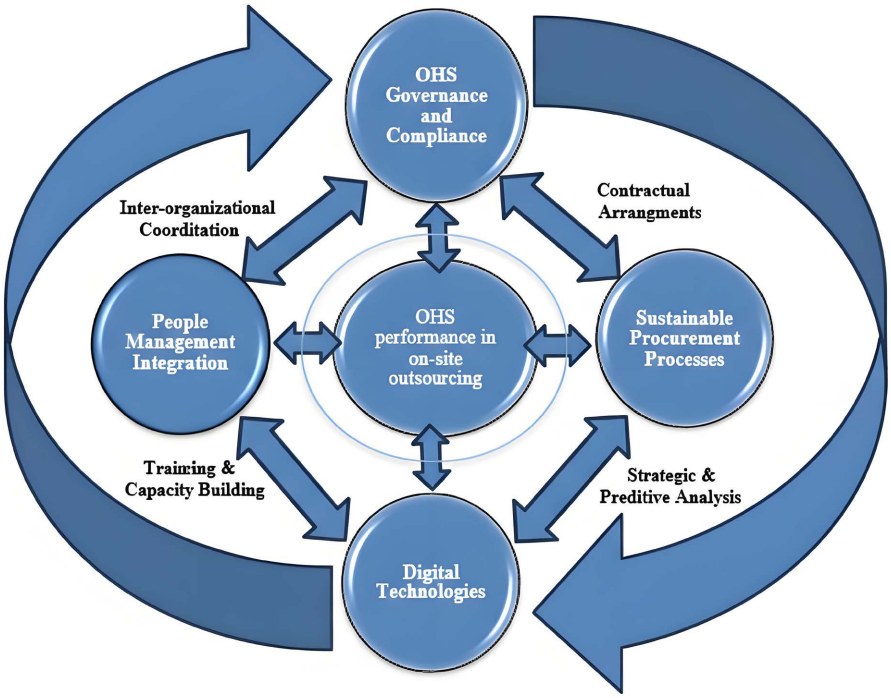
THEMATIC ANALYSIS	ON-SITE OUTSOURCING	AUTHORS	IMPLICATIONS
OHS Governance and Regulatory Compliance	Compliance improves formalization but does not guarantee maturity.	[1] [2] [4]	Need for shared governance and integrated systems.
Contractual Relations and Production Arrangements	Work fragmentation dilutes responsibilities and favors cost.	[4] [6] [11]	Reconfiguration of buyer-supplier relationships.
Integration between OHS and People Management	Better results when aligned with strategic Human Resources.	[3] [7] [10]	OHS as an organizational and cultural value.
Sustainable Procurement as a Lever for OHS	Advocacy for OHS integration from planning to execution.	[8] [12] [16] [17]	OHS as a strategic selection criterion.
Digital Technologies Applied to OHS Management	Digital tools enable predictive monitoring and risk analysis.	[14] [18]	Strengthening contract supervision and data-driven decisions.

Source: Developed by the author, based on the literature review.

Unlike conventional compliance-oriented OHS models, which conceptualize safety performance as an outcome of internal managerial controls, the proposed framework advances a structural governance perspective. It shifts the analytical unit from the single organization to the contractual network, emphasizing distributed authority, inter-organizational dependency, and asymmetrical bargaining power as core explanatory variables. This repositioning extends sociotechnical safety theory by integrating procurement governance, digital accountability infra-

structures, and contractual risk allocation into a unified explanatory architecture.

The results are discussed in light of the Integrated Operational Model presented in Figure 2, showing that Occupational Health and Safety (OHS) management in on-site outsourcing contracts must be understood as an integrated socio-technical system. In this system, performance emerges from the interaction between governance mechanisms, contractual arrangements, people management practices, procurement processes, and digital technologies. Unlike prior frameworks that focus on isolated organizational practices, this model conceptualizes OHS performance as an emergent outcome of interdependent governance mechanisms operating across organizational boundaries.



Source: Developed by the author, based on the reviewed literature.

Figure 2. Integrated operational model for ohs management in on-site outsourcing.

To enhance theoretical precision and empirical testability, the proposed sociotechnical framework is organized around the following core constructs: governance integration; contractual distribution of authority; human resource management (HRM) practices that span organizational boundaries; safety prioritization within procurement processes; and digital coordination infrastructure.

Based on the synthesis, four directional conceptual propositions are derived:

Proposition 1 - Increased contractual fragmentation intensifies risk displacement mechanisms, thereby reducing systemic safety coherence.

Proposition 2 - Cost-dominant procurement logics amplify decoupling between formal OHS systems and operational practice.

Proposition 3 - Cross-boundary HR integration mitigates governance fragmentation by functioning as a structural coupling mechanism.

Proposition 4 - The safety effects of digital accountability systems are contingent upon the degree of centralized governance authority.

The thematic synthesis indicates that OHS performance in internally outsourced environments cannot be attributed to discrete management practices or technical controls. Rather, safety outcomes emerge from interacting mechanisms operating across governance, contractual, organizational, and technological domains [2] [7].

Governance arrangements constitute the primary mediating mechanism linking fragmented production structures to safety performance. In multi-employer environments, governance determines how authority, accountability, and coordination are distributed across organizational boundaries [3]. Where governance mechanisms are weak or symbolic, formal OHS requirements tend to be decoupled from operational decision-making, allowing risk control responsibilities to be displaced toward actors with limited power to influence work organization [4]. Conversely, integrated governance arrangements—characterized by shared decision-making structures and explicit coordination mechanisms—can partially counterbalance fragmentation by re-centralizing accountability for occupational risk [7].

Contractual relations and production arrangements operate as structural mechanisms that shape incentives and redistribute risk. The literature consistently shows that outsourcing contracts prioritize cost efficiency and flexibility, implicitly encouraging risk transfer rather than risk elimination [6] [11]. In such contexts, OHS obligations are formalized contractually but operationally constrained by limited resources, tight production schedules, and restricted decision-making autonomy [4]. These contractual dynamics amplify power asymmetries between client firms and contractors, reinforcing patterns of risk displacement rather than systemic prevention [3].

Human resource practices function as mediating mechanisms at the operational level, influencing how structural conditions translate into everyday safety-related behaviors. When outsourced workers are excluded from training systems, participation mechanisms, and safety communication channels, organizational fragmentation is reproduced at the level of practice, weakening safety culture and increasing exposure to occupational hazards [3] [10]. Conversely, integrative HR practices that transcend organizational boundaries can mitigate fragmentation by fostering shared safety norms, participation, and collective learning [7].

Procurement practices represent a critical upstream mechanism shaping downstream safety outcomes. Contractor selection and evaluation processes that privilege financial and technical criteria while treating OHS as a secondary requirement systematically constrain opportunities for preventive risk control [11] [12]. Sustainable procurement models, by embedding OHS considerations throughout the contract lifecycle, have been shown to function as leverage points for aligning economic and safety objectives within fragmented production systems [8] [16].

Digital technologies introduce both enabling and destabilizing mechanisms

within OHS governance. While digital tools enhance data integration and predictive monitoring [13] [14], their effects depend on how they are embedded within governance structures. In the absence of shared accountability and decision-making authority, digitalization may intensify surveillance and shift responsibility downward, reinforcing existing power asymmetries rather than supporting proactive risk management [18].

Examples drawn from the analyzed studies further reinforce these mechanisms. [6], for instance, demonstrate how contractual clauses that limited contractors' autonomy in operational scheduling decisions constrained the implementation of preventive maintenance, thereby increasing exposure to operational hazards. Similarly, [11] show that prequalification processes predominantly based on financial criteria reduced the selection of firms with higher levels of safety maturity. In contrast, [7] report that joint safety committees operating between client and contractor enhanced information sharing and hazard communication, illustrating how governance integration can partially recentralize responsibility for risk control.

5. Conclusions

This study advances safety science by reconceptualizing occupational health and safety governance in internally outsourced environments as a structurally distributed system shaped by contractual design, power asymmetries, and inter-organizational coordination mechanisms. The limitations observed in standardized OHS management systems are not merely implementation failures but manifestations of deeper structural misalignments between internally bounded governance models and fragmented production architectures. By reframing safety performance as an emergent property of contractual networks, the study contributes to a structurally grounded theory of distributed risk governance. The findings underscore the need for safety science research to further interrogate how contractual, procurement, and digital governance mechanisms shape occupational risk in fragmented production systems. Future research should empirically examine the proposed framework across sectors and institutional contexts, exploring how different governance configurations mediate the relationship between organizational fragmentation and safety performance.

The findings suggest that improving safety in internally outsourced environments requires structural realignment rather than incremental compliance enhancement. Governance mechanisms must operate across contractual interfaces, aligning incentives, authority, and accountability structures. By reframing safety performance as an emergent outcome of distributed governance architectures, this study advances a structurally grounded perspective capable of informing both policy design and organizational strategy.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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