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INTEGRITY ASSURANCE ARCHITECTURES FOR LEAN CONSTRUCTION – THE CASE OF SERIØSITET IN NORWAY

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ABSTRACT

Lean Construction (LC) targets flow, learning, and reliable production. Still, crime and unethical behaviour can surface in LC-oriented delivery. This paper examines whether the Norwegian concept of "*seriøsitet*" (seriousness), and the practices grounded in it, can function as an integrity assurance architecture (IAA) enabling LC. Following an analysis of IGLC research on ethics, corruption, and crime, it explores Norwegian strategies, audits, and guidance on *seriøsitet* and work-life crime from 2006 to 2025. The analysis maps measures and their intended mechanisms across procurement, contracts, and follow-up. The findings indicate that *seriøsitet* is currently operationalised as an IAA, consisting of qualification requirements, standard contract clauses, verification routines, tier limits, and sanction ladders. The key mechanisms involve traceability of labour and money, supply chain supervision, and stronger client follow-up. However, outcomes depend on how these measures are enacted in practice, since weak monitoring can undermine deterrence and organisational learning. The paper suggests integrating *seriøsitet* checks into production planning and control rather than treating them as parallel compliance work. It also cautions against paper-driven compliance that adds administrative burden without improving integrity.

KEYWORDS

Corruption, social dumping, work-life crime, traceability, dark side.

INTRODUCTION

The construction industry is central to economic and social development, yet it continues to struggle with persistently low productivity growth, and recurring unethical and criminal behaviour. This includes corruption, collusion, bribery, bid rigging, fraud, and related misconduct, which erodes value for money, quality, and public trust (Lehtinen et al., 2022; Nkoba & Amoah, 2025; Owusu et al., 2019; Zarghami, 2024).

Unethical and criminal behaviour is increasingly treated as a multi-level Integrity Assurance Architecture (IAA) challenge rather than a purely individual problem. Research emphasises combining regulatory controls, compliance systems, supervision, audit quality, and credible enforcement, particularly in procurement and project oversight, while adapting measures to local institutional and sector conditions (Utami & Barokah, 2024; Yap et al., 2022; Yu, 2025).

In parallel, Lean Construction (LC) is foregrounded as a socio-technical system aimed at reducing waste, stabilising workflows, improving reliability, and enabling continuous

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improvement (McDermott et al., 2023; Seadon & Tookey, 2019). LC is operationalised through planning and control practices, learning routines, and structured collaboration, and it is often strengthened through integration with BIM and off-site or manufacturing-oriented delivery models (Tang et al., 2019).

A key emerging insight is that these agendas are interdependent. IAA can create the predictable and transparent operating conditions that LC needs, while LC and digital complements can reduce grey zones through traceability, standardised information flows, and timelier oversight (Chen et al., 2025; Musharavati, 2023). Here, IAA denotes procurement, contracting, and follow-up arrangements used to prevent, detect, and respond to misconduct.

Yet the literature rarely explains how such integrity measures can be assembled as auditable packages within LC-oriented delivery or how their effects may travel across contexts (Abuelaish & Toğan, 2024; Asmone et al., 2025; Owusu et al., 2019). This paper contributes by synthesising IGLC "dark side" research through an IAA lens, conceptualising Norwegian seriøsitet as a mechanism bundle, and distinguishing between Norway-specific institutional features and more transferable design principles. Norway is analytically useful because seriøsitet has been formalised across procurement guidance, audits, and inter-agency strategies, making otherwise diffuse integrity work observable in a coherent documentary trail.

1. How is unethical and criminal behaviour in construction conceptualised and evidenced in the IGLC literature?
2. How does the IGLC literature explain the ways this behaviour threatens LC enabling conditions?
3. To what extent can seriøsitet function as an IAA that addresses these underlying conditions?

THEORETICAL FRAMEWORK

Here, unethical and criminal behaviour in construction is considered as a system outcome created by information asymmetry, misaligned incentives, monitoring limits, and fragmented accountability in multi-tier value chains. To analyse how such opportunity structures can be reduced, we use an IAA lens: the bundle of arrangements that prevent, detect, and respond through procurement and contract requirements, verification routines, follow-up capacity, and escalation/sanctions, with traceability and value-chain simplification as core design levers. IAA shapes enabling conditions, such as transparency, role clarity, reliable commitments, and learning, yet can also generate waste when controls become paper-driven compliance rather than actionable verification.

CRIME, ETHICS, CORRUPTION, AND INTEGRITY IN THE IGLC LITERATURE

IGLC scholarship has evolved from early normative critique of LC's ideological implications toward applied work on integrity systems, corruption mechanisms, and supply-chain vulnerabilities. More recently, it has also addressed digitalisation and predictive approaches to "dark side" phenomena (Lohne et al., 2023). This aligns with broader corruption and project-governance literature, which likewise treats unethical outcomes as products of system design rather than individual morality alone (Lehtinen et al., 2022; Owusu et al., 2019; Zarghami, 2024). Across these contributions, recurring drivers are incentive structures, transparency and verification routines, monitoring capacity, and fragmented responsibility across complex value chains (Thameem et al., 2017; Lohne et al., 2021).

Early IGLC debate framed LC as ethically ambivalent, underlining how its compelling rhetoric can coexist with exploitation, surveillance, or narrowed definitions of "improvement" (Green, 1999). Howell and Ballard (1999) repositioned this critique as a challenge of interpretation and application, implicitly pointing toward the importance of governance and

integrity arrangements in determining whether LC principles support ethical outcomes. Later work shifted from macro-critique to the ethical tensions embedded in ordinary project work. Ethical issues emerge through hidden agendas, loyalty shifts, and decision-making processes (Svalestuen et al., 2015), while value delivery can generate dilemmas when stakeholder values are misaligned, producing distributive and procedural conflicts (Drevland et al., 2017).

A parallel stream frames integrity and anti-corruption as operational properties that can be designed into project systems. Thameem et al. (2017) connect unethical behaviour to delivery methods and social network structures, implying that relationship configurations influence both the emergence and containment of misconduct. Stifi et al. (2014) explicitly align integrity with LC planning and commitment practices (e.g., Last Planner), emphasizing accountability and "honouring one's word" as practical anchors. Building on this, Stifi et al. (2017) propose anti-corruption measures that combine transparency with answerability. At the same time, the literature also implies a limit: LC tools do not guarantee ethical outcomes on their own if monitoring, enforcement, and leadership commitment remain weak.

ARENAS OF VULNERABILITY AND OPPORTUNITY STRUCTURES

IGLC contributions locate "dark side" risks in recurring arenas where verification is weak, discretion is high, and accountability is fragmented. The table below condenses the main arenas and the vulnerabilities emphasized in the literature.

Table 1: Vulnerability and opportunity structures in literature

Arena	Typical vulnerability/opportunity structure	Illustrative IGLC contributions
Design & decision processes	Hidden agendas, loyalty shifts, manoeuvring; "room of manoeuvre" between legal and ethical	Svalestuen et al. (2015); Drevland et al. (2017)
Supply chains: products & materials	Counterfeit/substandard inputs entering projects when trust substitutes for verification and traceability	Engebø et al. (2016); Kjesbu et al. (2017)
Administrative interfaces (e.g., permits)	Discretion + normalization of questionable practice; blurred ethical–illegal continuum	Rizk et al. (2018); Wold et al. (2019)
Process and service design in official systems	Low transparency/reliability enabling rent-seeking; weak audit trails	Daramsis et al. (2018)
Value-chain structure and contracting	Opacity and monitoring limits amplified by many tiers; diluted responsibility	Aure et al. (2020); Lohne et al. (2021)

More recent work strengthens the "structural drivers" explanation. Aure et al. (2020) position limitations on vertical contract tiers as a structural integrity intervention that can improve oversight and reduce exposure to criminal actors. Lohne et al. (2021) synthesize these dynamics through principal–agent theory: information asymmetry, misaligned incentives, and monitoring challenges create predictable conditions for wrongdoing. Alongside this, digitalization introduces both new integrity opportunities and new ethical dilemmas. Arroyo et al. (2021) highlight accountability and societal issues when decisions are delegated to algorithms, while Lohne et al. (2023) propose forecasting approaches that account for temporality, value-chain position, and typologies of misconduct, shifting integrity efforts from purely reactive toward partly anticipatory strategies.

KNOWLEDGE GAP

IGLC's "dark side" literature increasingly explains misconduct through structural opportunity conditions, but offers limited synthesis of institutionalised integrity strategies that organisations can embed across procurement, contracts, and day-to-day production control. While tool proposals exist (Stifi et al., 2014, 2017) and redesign of administrative interfaces has been suggested (Daramsis et al., 2018), the translation of integrity concepts into coherent, auditable packages remains underdeveloped. There is also limited discussion of how far LC can shape ethics by itself, how such packages relate to wider anti-corruption literature, and which elements are transferable beyond the institutional setting in which they were developed.

METHODS

We use a qualitative, mechanism-oriented design combining conceptual synthesis with document analysis. This approach was chosen because the object of study is a formalised integrity architecture as expressed in strategies, guidance, audits, and evaluation documents, rather than project participants' perceptions or measured project outcomes. Seriøsitet is treated as an emergent IAA, that is, as a bundle of arrangements intended to prevent, detect, and respond to misconduct. "Mechanisms" refer to the implied ways these arrangements reduce opportunity structures (e.g., by increasing traceability, lowering information asymmetry, or strengthening escalation credibility). We therefore aim for analytical, not statistical, generalisation.

DATA MATERIAL AND SCOPE

Two streams form the analytical basis. First, the IGLC "dark side" stream comprises 16 IGLC conference papers (1999–2023) that explicitly address unethical, illegal, corrupt, or integrity-compromising phenomena in LC-oriented settings. Papers were identified through a two-step screening process in the IGLC.net Conference Papers database (accessed September 2025): keyword based title/abstract/keyword screening followed by backward citation chaining and targeted follow-up searches. Search strings included ethic* OR integrity OR corrupt* OR fraud* OR crime* OR accountab* OR "anti-corruption", with a second pass using illegal*, unethical*, "dark side", counterfeit*, and "questionable practice". The first screening yielded 11 eligible papers; backward citation chaining and targeted follow-up searches added 5 (final n = 16).

Second, the Norwegian corpus comprises 30 public and industry documents (2006–2025), assembled purposively and expanded through snowballing from core strategies, procurement guidance, audits, and evaluations. Searches were conducted in Oria and Google Scholar using Norwegian terms including seriøsitet, seriøsitetsbestemmelser/seriøse krav, arbeidslivskriminalitet/A-krim, sosial dumping, påseplikt, HMS-kort, skatteattest, and leverandør-/kontraktsoppfølging. Documents were included if they defined seriøsitet and its scope, specified auditable measures, or assessed implementation.

DOCUMENT SELECTION AND INCLUSION LOGIC

Norwegian documents were prioritised where seriøsitet was operationalised through auditable practices, such as supplier requirements, documentation and verification routines, contract clauses and audit rights, follow-up practices, tier controls, and sanction capacity. Duplicative texts and documents that were purely political statements without operational detail were excluded. Because the study relies on public material, internal client routines, contractor records, and case-specific audit files that were not publicly accessible could not be examined. IGLC papers were included where they conceptualised unethical or criminal behaviour, evidenced its presence in delivery, or discussed mechanisms by which it undermines LC enabling conditions.

DATA ANALYSIS

Analysis extracted and compared "what is done" and "how it is expected to work". For the Norwegian corpus, documents were first read chronologically to map shifts in problem framing and were then coded by delivery-system entry point (qualification/selection; contract conditions/audit rights; systematic follow-up; response/escalation). First-cycle codes included, for example, tier limits, ID/HMS-card controls, wage and working-condition verification, audit rights, withholding, and close-out learning; these were then grouped through the IAA lens (prevent/detect/respond/learn) and linked to mechanisms, LC enabling conditions, and failure modes. For the IGLC stream, papers were coded for conceptualisations and evidence of misconduct and for described impacts on LC enabling conditions, producing the synthesis themes and vulnerability arenas used in Table 1. To strengthen transparency, patterns were iteratively cross-checked across policy texts, audits, and evaluations to distinguish formal intent from reported implementation challenges. The study cannot estimate effects, and policy-oriented documents may overstate intended coherence while underreporting informal workarounds or weak enforcement.

RESULTS

SERIØSITET IN NORWAY: CONCEPTUAL CORE AND DELIMITATION

In the Norwegian corpus, *seriøsitet* functions as a practical expression for legitimate, controllable, and accountable market participation in labour-intensive, chain-structured delivery systems. The concept is operationally expressed through auditability: lawful wage and working conditions, compliant tax/fee reporting, identifiable labour on site (e.g., ID/HMS-card regimes), and documentation practices that enable verification across subcontracting tiers. In effect, *seriøsitet* is framed as the positive counter-concept to the market conditions that enable work-life crime (A-krim). A stable delimitation in strategies and situational assessments is the distinction between a broader "seriøsitetsfelt" (a "field of *seriøsitet*", where social dumping, weak compliance, and unfair competition may overlap with illegality) and A-krim as the illegal core (systematic, profit-driven breaches of labour, tax/fee, and welfare rules). Empirically, the corpus stresses gliding transitions: underpayment and exploitative work arrangements may co-occur with tax evasion, fictitious invoicing, welfare abuse, and straw-person structures. This makes the boundary between "grey-zone" practice and A-krim fluid.

EVOLUTION OF THE NORWEGIAN FRAMING

The corpus shows a clear temporal shift from mid-2000s "social dumping" framings toward a mid-2010s crime-and-control framing. Early materials emphasize erosion of wages/working conditions and unfair competition, motivating action-plan logics. From 2014 onward, the field is increasingly framed as A-krim, supported by inter-agency assessments and construction-specific analyses emphasizing multi-crime business models. This reframing is consolidated in strategies and plans and is followed by more coordinated tool development and standardisation.

Later evaluations and annual reporting describe both strengthened responses (inter-agency control capacity, standardised contract tools, risk-based targeting) and adaptive criminal strategies, implying that *seriøsitet* must be designed against circumvention and updated over time. Steering analyses also highlight recurring challenges in effect measurement, information flows, and alignment between administrative and penal enforcement.

OPERATIONALISING *SERIØSITET* AS AN AUDITABLE PACKAGE

Across Norwegian audits, evaluations, and guidance, public procurement is consistently presented as both a risk arena and a primary lever for shaping market behaviour. The central mechanism is economic: very low bids can reflect illegal cost advantages, which undermines

fair competition and is repeatedly linked to delivery risk and quality erosion. The corpus therefore documents a shift toward procurement approaches that reward documented seriøsitet through qualification requirements, contract clauses, verification plans, and sanction capacity, as summarised in Table 2.

Table 2: Seriøsitet as IAA: Instrument, Mechanisms (M), LC linkages, and Failure mode. P = Prevent, D = Detect, R = Respond, L = Learn; CI = continuous improvement

Instrument	M	LC Link	Failure mode	Norwegian source
Pre-qualification (procurement)	P	Reliability	Checklist-only. Treat as award constraint; re-check at mobilisation	DFØ, NHO, Fellesforbundet & KS (2025); Oslo kommune (2023); Implement Consulting Group (2016); SMSØ (2021); NTAES (2020)
Standard clauses + audit rights (contract)	P/D	Transparency	Clauses unused. Assign owner; set minimum follow-up cadence	DFØ, NHO, Fellesforbundet & KS (2025); Oslo kommune (2023); Riksrevisjonen (2016); Riksrevisjonen (2022); Arbeids- og sosialdepartementet (2017)
Wage/ conditions compliance (contract/ site)	D/R	Stability	High paperwork, low signal. Risk-based sampling; check early	Arbeids- og sosialdepartementet (2015); LO (2018); Samfunnsøkonomisk analyse (2016); Eldring et al. (2011); St.meld. nr. 2 (2005–2006) (2006); Arbeids- og inkluderingsdepartementet (2009)
ID/HMS-card + identity controls	D	Visibility	Turnstile ritual. Link to approved subcontractors + scope ownership	A-krimsenteret i Oslo (2021); Arbeidstilsynet et al. (2014); Kripos (2014); Arbeidstilsynet, NAV, Politiet & Skatteetaten (2021); Økokrim (2023)
Tier limits + pre-approval	P	Role clarity	Slow approvals and fast SLA; unauthorised tiers = hard stop	Oslo kommune (2023); Implement Consulting Group (2016); NTAES (2022); Neby et al. (2016)
Verification routines	D	Learning	Random checks. Simple PDCA with trigger-based audits	Deloitte (2022); KPMG (2022); DFØ (2018); Riksrevisjonen (2016); NTAES (2020); Byggkvalitetsutvalget (2020)
Sanction ladder + escalation	R	Reliability	Inconsistent escalation. Predefined rules	DFØ, NHO, Fellesforbundet & KS (2025); Oslo kommune (2023); Arbeids- og sosialdepartementet (2017)
Close-out learning (portfolio)	L	CI	No feedback; short integrity review; update risk criteria	DFØ (2018); Arbeidstilsynet, NAV, Politiet & Skatteetaten (2023); Riksrevisjonen (2022)

The Norwegian material converges on a relatively standardised operational package, commonly expressed through shared "seriøsitetsbestemmelser" (seriousness regulations) and municipal models. This package combines documentation and verification requirements (e.g., ID/HMS

cards; wage and working-condition compliance), competence requirements (e.g., skilled workers/apprentices), chain regulation (tier limits and pre-approval of subcontractors), and sanction ladders (withholding, price reductions, termination/exclusion).

Table 2 maps these instruments to their intended mechanisms, LC linkages, and main implementation risks.

A repeated design principle is coherence from qualification and selection, via contract conditions and audit rights, to systematic follow-up and close-out learning. The corpus also emphasises that effects depend on client capability: competence, resourcing, and willingness to react when breaches are detected.

MECHANISMS AND THE DOMINANT IMPLEMENTATION

Taken together, the Norwegian corpus supports the interpretation of *seriøsitet* as an IAA expressed through bundles of mechanisms rather than single measures. The most robust mechanisms highlighted are traceability of labour and money flows (to reduce concealment space), value-chain simplification and responsibility clarity (to reduce information loss and improve oversight feasibility), credible monitoring (audit quality and risk targeting), and credible enforcement (predictable escalation and meaningful sanctions).

The most consistent cross-cutting result is an implementation gap: the challenge is less "what to require" than whether requirements are followed up in practice. Where monitoring is weak and escalation inconsistent, deterrence and learning are undermined, and *seriøsitet* risks becoming symbolic. Conversely, where the package is implemented coherently (from qualification, via contract, verification, escalation/sanctions, to learning), the corpus implies both reduced exposure to unlawful actors and strengthened operating conditions for LC.

DISCUSSION

Three discussion points follow from these findings. First, the IGLC "dark side" stream largely treats unethical and criminal behaviour as a system-level outcome shaped by project and supply-chain design rather than individual deviance. The most consistent explanatory elements are opportunity structures created by information asymmetry, misaligned incentives, weak or symbolic monitoring, and fragmented accountability in multi-tier value chains. This reading is broadly consistent with non-IGLC corruption scholarship, but the LC literature adds a more explicit concern with how such conditions undermine flow, commitment reliability, and learning.

Second, LC and IAA tend to reinforce each other, but only when integrity controls are embedded in day-to-day production management. IAA reduces uncertainty through clearer requirements, credible monitoring, and enforceable follow-up, while LC prevents integrity from becoming parallel bureaucracy by placing key checks inside lookahead planning, Last Planner commitment management, handoff control, and deviation handling. Digital tools, such as common data environments, access-control logs, and traceable supplier documentation, can strengthen this interaction by making interfaces more auditable. The interaction can also turn negative: documentation-heavy controls may generate administrative rework and performative compliance, while LC applied under intense time and cost pressure without transparency and accountability can incentivise corner-cutting. Across both literatures, four mechanisms stand out: actionable traceability, credible risk-targeted monitoring, predictable escalation, and value-chain simplification.

Third, context shapes what can travel. In Norway, seriøsitet benefits from relatively strong public procurement capacity, inter-agency enforcement, and shared contractual models; these features are context-dependent. More transferable are the underlying design principles: front-end gatekeeping, contractualised audit rights, systematic follow-up, and credible response capacity. The main implementation risk is not simply non-compliance, but symbolic

compliance: checklist behaviour, responsibility shifting, and paperwork that burdens legitimate firms without improving detection. This also suggests a possible unintended consequence for other settings: if controls are poorly targeted, they may exclude smaller firms with weak administrative capacity while leaving sophisticated offenders able to adapt.

The strongest alignment between seriøsitet and LC therefore clusters around visibility, standardisation, and accountability. Traceability supports making work visible and auditable; simplified chains reduce handoffs and ambiguity; and learning loops support continuous improvement. The main tension sits between enforcement and psychological safety. The most LC-compatible integrity approach is therefore not weaker enforcement, but clearer escalation rules and a practical distinction between unintentional deviations (coach, correct, learn) and deliberate misconduct (investigate, sanction).

Taken together, this positions seriøsitet not as "extra control," but as a production-system IAA. Its broader relevance lies less in the Norwegian label itself than in the mechanism bundle it makes visible.

CONCLUSION

This paper synthesised IGLC "dark side" research to clarify how unethical and criminal behaviour is conceptualised as a system outcome shaped by information asymmetry, incentive misalignment, monitoring limits, and fragmented accountability, and how these conditions degrade LC enabling conditions such as workflow stability, reliable commitments, transparency at interfaces, and learning routines. Against this background, it examined Norwegian seriøsitet as an emergent IAA and found that it is operationalised as an auditable package combining qualification requirements, standard contract clauses, verification routines, tier limits, and sanction ladders. The paper's main theoretical contribution is to connect LC "dark side" research with an IAA lens and to show how seriøsitet can be understood as a mechanism bundle rather than a single control.

The main practical implication is that seriøsitet controls should be integrated into production planning and control so that integrity work supports, rather than competes with, LC production logic. Methodologically, the paper shows the value of mechanism-oriented document analysis for identifying auditable integrity architectures, while also acknowledging its limits: the study cannot validate project-level effects and is shaped by the availability and bias of public and policy-driven documents. Future studies should therefore test these mechanisms through project cases, interviews, and cross-country comparison to distinguish Norway-specific institutional features from more transferable design principles.

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