



Effective Communication as a Strategic Element for Dispute Avoidance in Gulf Cooperation Council Construction Projects

Ali Al-Khalifa*

Email: Ali.Nasser.Alkhalifa@gmail.com

Abstract

Effective communication is the first line of defence against Gulf Cooperation Council (GCC) construction disputes, where escalating compressed programmes and multicultural teams risk misunderstandings. The current study elaborates on four communication-centric artefacts—dispute avoidance/claim avoidance committee (DACA), countdown clock, aligning project managers' key result indicators (KRIs), and escalation mechanism—to improve communication in this field. This GCC construction field study is based on the five-stage design science research cycle comprising exploration, development, implementation, evaluation, and conclusion. The executive-level DACA meets routinely or ad hoc when a formally escalated issue demands chief executive officer-level attention. A project-wide countdown clock mirrored to cloud dashboards and daily briefings keeps on-site and remote actors aware of milestone pressures. Alignment of project managers' KRIs redirects attention from historical cost–time metrics to forward-looking communication health, whereas a tiered escalation mechanism provides a transparent, time-bound pathway for matters exceeding the DACA's remit. Qualitative evidence shows that integrated use of these artefacts shortens issue-resolution lead times and curtails the escalation of incipient claims. These tools can convert latent dispute triggers into managed risks by feeding their outputs directly into the project risk register. This study fills GCC-specific evidence gaps on proactive, communication-driven dispute avoidance tools.

Keywords: communication management; countdown clock artefact; design science research; dispute avoidance/claim avoidance committee; dispute avoidance; early-warning systems; escalation mechanism; Gulf Cooperation Council construction projects; key result indicators; proactive communication; proactive contracting; structured communication.

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* Corresponding author.

1. Introduction

Construction projects in the Gulf Cooperation Council (GCC) region are renowned for their ambitious scale, compressed programmes, and multicultural stakeholder mix. Whilst these attributes drive innovation and rapid development, they increase the likelihood of misunderstandings, scope creep, and formal disputes. Industry studies report that schedule overruns, inflated contingency spending, and deteriorating working relationships erode project value [1]. Although construction management practices have evolved over the past two decades, the persistent recurrence of disputes suggests that prevailing approaches underemphasise one decisive factor: communication [2]. When information flows are fragmented or delayed, even well-written contracts and sophisticated project-control systems do not prevent issues' escalation.

The GCC construction industry historically depended on reactive mechanisms—chiefly arbitration or litigation—to resolve conflicts [3]. Whilst occasionally unavoidable, these avenues are costly, time-consuming, and adversarial, often leaving residual ill will and jeopardising future collaborations. Critically, they address the conflicts' *symptoms* rather than root causes, leading to repetitive dispute cycles. The resulting financial drag and reputational damage have sparked academic and practitioner-focused calls for a decisive shift towards proactive dispute avoidance.

A systematic review of dispute-causation literature underscores that *poor, untimely, or ambiguous communication* is the dominant precursor to conflict in the GCC's fast-track environment. However, few empirical studies have examined the proactive, communication-driven mechanisms implemented in GCC megaprojects despite their consistently higher number of disputes compared to global averages [4,5]. This presents a twofold research opportunity to (1) design artefacts that translate communication theory into field-ready tools and (2) demonstrate—through live-project evidence—how such tools pre-empt disputes rather than merely documenting them.

In response to this opportunity, a **recent field investigation developed a dispute-avoidance roadmap** integrating contract clarity, process discipline, risk reframing, and managerial alignment into a single coherent ecosystem. The present study focused on four artefacts that constitute the roadmap's 'communication spine'.

1. **Dispute avoidance/claim avoidance committee (DACA):** An executive-level body co-chaired by the clients' and contractors' chief executive officers (CEOs) who meet on a scheduled monthly cycle—or ad hoc when a formally escalated issue warrants CEO attention—to review high-impact items recorded in the shared tracker and issue binding, jointly signed resolutions
2. **Countdown clock:** A real-time, cloud-mirrored timer linked to critical milestones, ensuring that on-site teams and remote decision-makers remain acutely aware of schedule pressure
3. **Alignment of project-manager key result indicators (KRIs):** Forward-looking metrics that translate communication health into measurable, mutually understood targets
4. **Escalation mechanism:** A tiered, time-bound pathway that channels unresolved matters to progressively higher decision levels whilst preserving transparency and auditability

Collectively, these tools convert latent dispute triggers into managed risks, foster a collaborative information culture, and reduce decision latency across the project supply chain.

Drawing on Middle East early-avoidance work [6], we employed a five-stage design science research (DSR) cycle comprising exploration, development, implementation, evaluation, and conclusion to develop and evaluate the artefacts. The initial qualitative coding of incidents isolated thematic elements that directly affected communication breakdowns. These insights guided the four artefacts' iterative designs piloted on live mixed-industrial development. We also summarised the data-to-artefact flow and located specific artefacts within the roadmap.

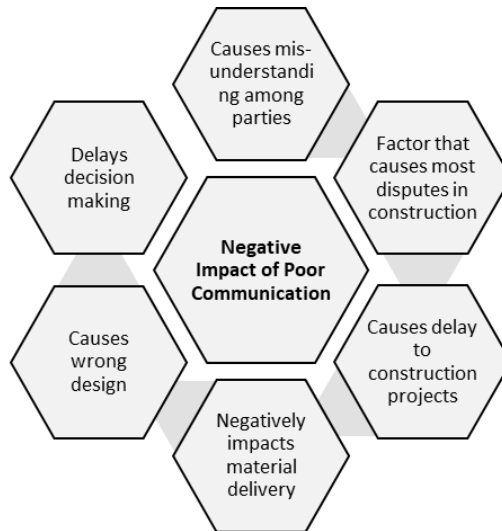
2. Theoretical background

Effective communication is a fundamental determinant of construction projects' global success. Extensive research has consistently identified communication failure as the leading cause of disputes, with catastrophic impacts on project timelines, budgets, and stakeholder relationships [7,8]. Communication inadequacies—such as unclear contractual terms, insufficient information exchange, inadequate stakeholder engagement, and ambiguous decision-making processes—significantly contribute to construction disputes [9,10]. Furthermore, studies in prominent construction management journals have emphasised that timely, accurate, and transparent communication is essential for dispute prevention and effective project management [11,12].

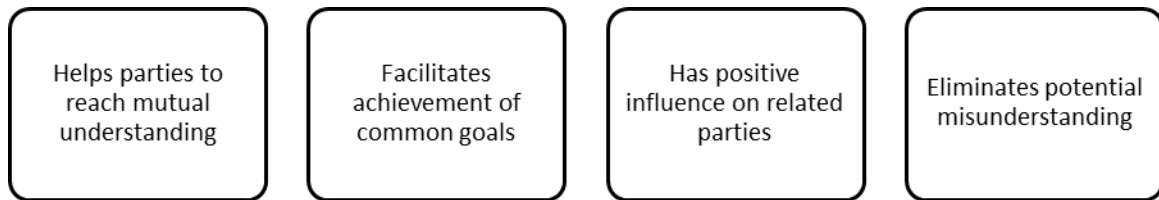
To address this, our artefacts embed [13] three information components—accuracy, timeliness, and completeness—in daily routines. As effective messaging must also be audience-specific [14] and perception-aware [15], principles appear in DACA's CEO briefs and the site-level countdown clock.

Figure 1a charts the cascade of negative impacts of communication breakdowns, whilst Figure 1b shows the upside: clear, timely, and transparent messages reduce costs and shorten schedules.

Building on the contractual, interpersonal, and technical categories outlined above, dispute development research traces a predictable continuum through which an ordinary project issue can mature into a formal claim. Synthesising earlier work, Cheung and Suen and Love and his colleagues [16,17] described four sequential stages—problem identification, disagreement, conflict, and dispute requiring third-party determination—which anchor the multi-artefact roadmap in this study. Figure 2 visualises the continuum and highlights where proactive, communication-rich interventions (green band) can resolve matters internally, long before reactive, litigation-centred measures (blue band) dominate [2]. This preventive logic begins with well-defined contracts and scopes because precision in obligations, deliverables, and risk allocation shrinks the grey zone where misunderstandings arise [3]. All four artefacts we assessed are deliberately designed to operate inside this green zone, converting emerging disagreements into closed actions rather than crystallised claims.



(a)



(b)

Figure 1: impacts of (a) poor and (b) good communication on construction projects

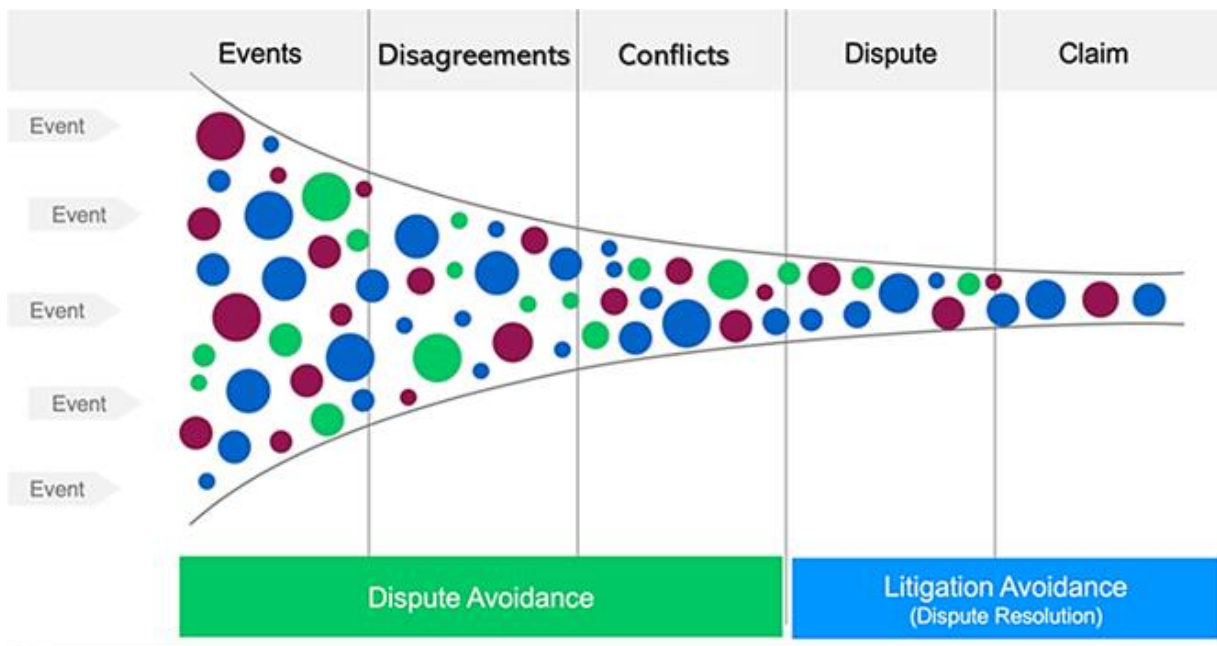


Figure 2: dispute avoidance–litigation avoidance funnel

Thus, the volume and velocity of ‘events’ entering the left side of Figure 2 are even higher in the Gulf, making early intervention critical. In the GCC, distinctive socioeconomic, cultural, and organisational factors magnify communication challenges. Rapid diversification agendas, multi-billion-dollar megaprojects, and heavy reliance on international consortia generate heterogeneous teams whose members bring divergent commercial norms, languages, and expectations [18,4]. Construction communication operates on three planes—downward (management→site crews), upward (frontline feedback→management), and lateral (peer-to-peer coordination)—all of which must remain open to prevent escalation [19]. When these channels perform well, projects meet ≈80% of their original goals and finish 71% of components on time, whilst 76% of projects remain within budget [20]. Hierarchical decision chains, still prevalent in many Gulf client bodies, further restrict horizontal information flow, slow approval, and allow misunderstandings to ferment [21]. These context-specific pressures reinforce the need for *formal* communication vehicles such as DACA reviews, countdown clock prompts, and the five-level decision ladder, all of which keep issues within the green dispute-avoidance zone.

Further complexity arises from the GCC’s distinctive socioeconomic context. The regional emphasis on rapid infrastructure development to diversify economies often pressures projects with aggressive timelines and high expectations. Consequently, the environment is ripe for disputes caused by unrealistic timeframes and insufficient pre-construction planning, frequently compounded by inadequate communication amongst stakeholders [22,21].

Cultural factors also significantly influence GCC construction projects’ communication dynamics. High-context cultures prevalent within the region, characterised by implicit communication and indirect expressions, hinder clear and explicit information exchange vital for construction project success [23,24]. Moreover, cultural norms emphasising relationship building and harmony can delay or discourage timely issue escalation, further intensifying potential disputes [18] and contradicting Larson’s [25] call for good-faith dialogue. For example, in GCC projects, stakeholders may avoid openly discussing project risks or potential delays owing to cultural tendencies towards maintaining harmony, ultimately leading to greater complications [26].

Communication theories, such as the transactional model and information richness theories, further clarify how communication breakdowns occur and escalate disputes. The transactional model highlights that effective communication requires active participation and continuous feedback loops, which hierarchical organisational structures can hinder. Information richness theory emphasises the need to choose appropriate communication channels based on the complexity of shared information. Accordingly, Daft and Lengel [27] emphasise ‘selecting a channel appropriate to message complexity’, minimising distortion and underscoring frequent communication method mismatch, where important project decisions are inadequately communicated through emails or memos rather than direct, interactive discussions. The need for instantaneous feedback loops aligns with Barnlund’s [28] transactional communication model.

Recent systematic reviews highlight scant field data on early-warning communication tools, especially in high-context cultures such as the GCC [29,30]. However, comprehensive practical frameworks tailored to GCC construction projects remain scarce in scholarly and industrial literature, presenting a significant gap. Consistent with the position that potential disputes should be recorded in the project risk register, this study treated each communication artefact as a risk-mitigation control within the project’s formal risk-management framework.

This study employed the DSR methodology to investigate structured communication interventions. The four chosen artefacts provide robust mechanisms to mitigate communication-related disputes in GCC construction. These artefacts can significantly reduce disputes through proactive engagement, transparency, and structured conflict management by explicitly addressing critical communication weaknesses identified by global and regional literature.

This literature review underlines the imperative to develop, validate, and implement structured communication frameworks for GCC construction projects, addressing the identified socioeconomic, cultural, and organisational challenges. We provide a detailed analysis and practical insights into how these structured communication tools can improve dispute prevention outcomes.

3. Methodological approach: Design science research

DSR is particularly well-suited for addressing complex practical issues prevalent in construction management. In this study, DSR follows five iterative stages—exploration, development, implementation, evaluation, and conclusion—with a deliberate feedback loop allowing results from any stage to inform earlier stages. Empirical data for this design cycle are derived from **16 semi-structured interviews**—nine with client representatives, four with contractor personnel, and three with consultants—and **two focus-group workshops**, generating transcripts for thematic coding and validation. Exploration combined problem identification with objective definition; development and implementation covered artefact design and building; evaluation generated empirical evidence; and the conclusion disseminated findings. Accordingly, this study reported on the development to the conclusion stages.

Figure 3 traces the complete data analysis flow, generating the examined artefacts to make this lineage explicit. Initial qualitative coding of 150+ conflict incidents collapsed them into 43 categories, nine themes, and three overarching dimensions (contract, project manager, and process); these abstractions yielded artefacts, four of which formed the communication spine assessed here. This aligns with Zulch's [31] view that precise information flow is the primary way to reduce project uncertainty. DSR ensured that the developed artefacts were theoretically robust and practically impactful, bridging the gap between academic research and practical construction management needs.

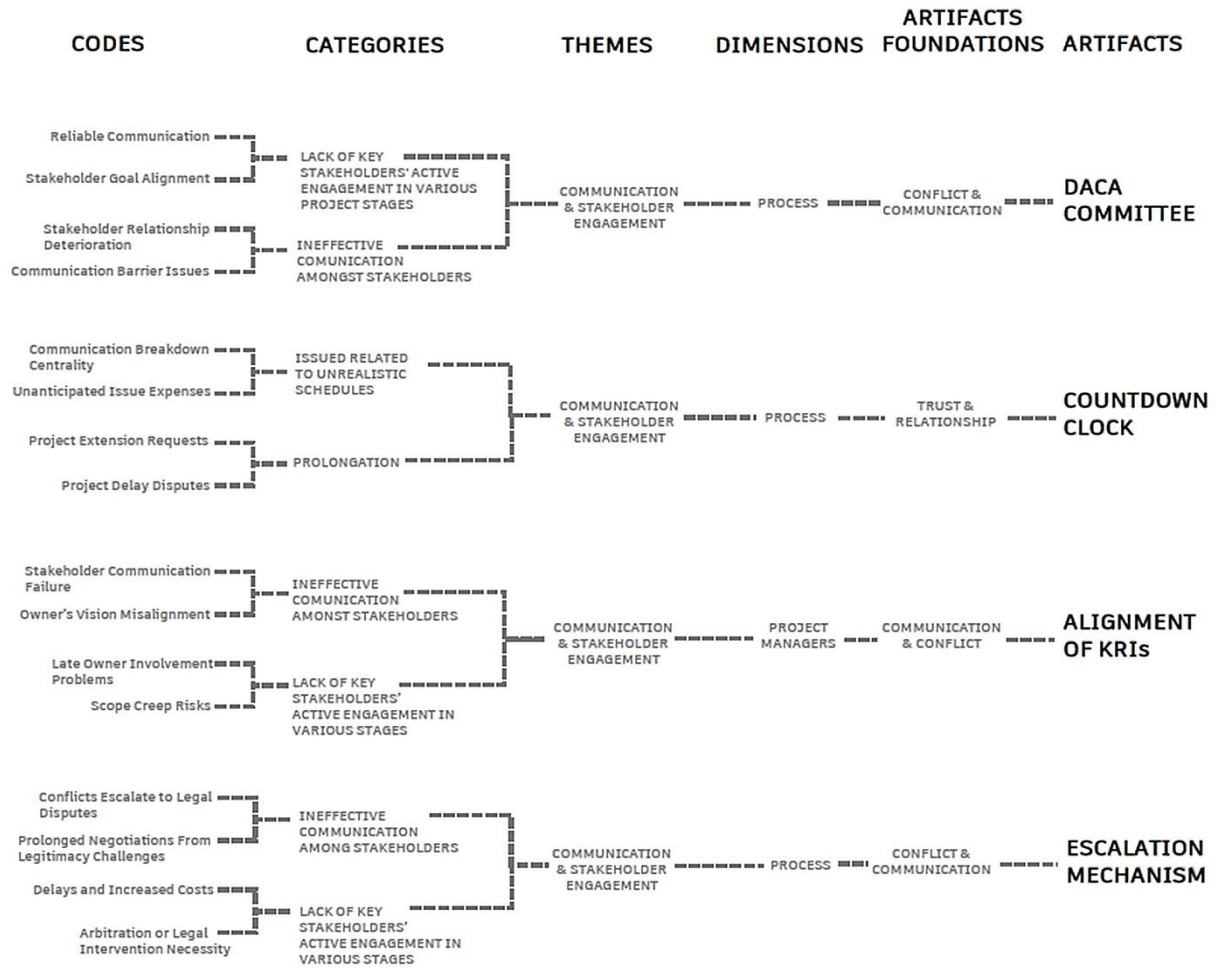


Figure 3: artefacts' evolution. DACA=dispute avoidance/claim avoidance committee; KRI=key result indicator

4. Structured communication in action: Analysis of strategic artefacts

4.1. Artefact 1: Dispute avoidance/claim avoidance committee

4.1.1. Description

DACA is an executive-level forum embedded in a contract's escalation schedule. Membership is limited to the client's and contractor's **general managers (CEO equivalent)**. Therefore, every decision carries the highest corporate authority. The committee meets **regularly each month and ad hoc whenever complexity, cost, or programme risk demands faster action**. Agenda items emerge from the five-level escalation mechanism if lower tiers cannot resolve them within the one-week window allocated to each stage. A secretary prepares minutes within two working days, logs every action in a **shared tracker**, and secures both CEOs' signatures to confirm the resolution. These jointly signed minutes form permanently auditable records.

4.1.2. Communication dimension

DACA replaces fragmented, chain-of-command messaging with **direct, face-to-face dialogue between the ultimate decision-makers**. The predictable cadence ensures that issues surface quickly, whereas the ad-hoc trigger prevents critical risks from waiting for the next calendar slot. Signed minutes and the tracker create a **single source** of truth, eliminating ambiguity and ‘re-litigation’ of closed items.

Table I compares routine progress meetings and a DACA meeting, illustrating why the latter operates as an apex dispute-avoidance forum rather than a mere progress review.

Table I: DACA versus progress review meetings

Criterion	Progress Meeting	DACA Meeting
Purpose	Monitor day-to-day progress; resolve tactical issues	Resolve high-impact issues that project teams cannot settle; prevent disputes
Frequency	Weekly/bi-weekly	Scheduled monthly + ad hoc on escalation
Attendees	PM, site engineers, QS, and planners	Client and contractor CEOs (+ specialists as invited)
Agenda	Schedule review, safety, quality, and look ahead	Escalated item(s); strategic decisions
Decision level	Within the delegated project-team authority	Executive authority binding on both parties
Documentation	MoM, action list, and updated progress report	Formal, jointly signed record of the decision

Note: DACA=dispute avoidance/claim avoidance committee; PM=project manager; QS=quality surveyor; CEO=chief executive officer; MoM=minutes of the meeting.

4.1.3. Real-world application

This study escalated four high-impact issues—two scope-interpretation questions, one payment-schedule dispute, and one subcontractor-delay claim—to the DACA between May 2021 and February 2022. All four were closed within 10 calendar days of entry into the tracker, in line with the one-week target per escalation level. For example, an early disagreement over the foundation-phase scope was resolved when each party tabled design intent and cost evidence. The CEOs agreed with a minor schedule extension and avoided a formal claim, keeping critical-path activities on track. The signed minutes were uploaded to the tracker the same week, and no further action was required.

4.1.4. Stakeholder perspectives

A post-intervention survey revealed a marked shift in engagement. Contractor GM remarked, ‘This is the first time I have interacted so much with the Client’s CEO on operational matters’, crediting the DACA for fast, high-trust decisions. Client executives highlighted the signed minutes’ transparency and binding nature, noting that

unresolved risks no longer accumulated unseen between progress meetings.

4.1.5. Communication theory application

Stakeholder theory explains the DACA's effectiveness: The forum keeps principal actors continuously aligned with objectives and constraints. *Information richness theory* indicates that face-to-face CEO sessions convey nuanced intent and reduce misinterpretation—a crucial advantage over written exchanges in high-stakes issues.

4.1.6. Implications for dispute avoidance

By intervening only when lower tiers stall—especially in a documented, binding setting—the DACA prevents nascent conflicts from maturing into formal disputes or claims. Executive presence accelerates resolution, safeguards relationships, and maintains programme momentum, directly supporting on-time, on-budget deliveries. The field results demonstrate that the mechanism saved at least a one-week potential delay for each escalated issue and eliminated external legal costs during the observation period.

4.2. Artefact 2: Countdown clock

4.2.1. Description

The countdown clock is a structured, visual project management tool explicitly developed to enhance stakeholders' awareness of critical milestones and deliverables in construction projects. Findings indicate that the countdown clock visually represents key deadlines and critical phases, prominently positioned at the project's main entrance—an area with high visibility accessible to all stakeholders and project visitors. This symbolises a public commitment to project timelines, significantly enhancing accountability and reinforcing stakeholders' responsibility towards milestone adherence.

Operationally, the countdown clock is updated regularly to reflect real-time project status, milestone achievements, and timeline adjustments due to unforeseen challenges or project developments. This ensures that accurate, current information is consistently communicated, maintaining stakeholder alignment and mitigating misunderstandings regarding progress and responsibilities. It also guarantees that *all* project participants, including subcontractors, are continuously aware of the agreed timelines and receive timely notices of schedule changes.

4.2.2. Communication dimension

The countdown clock improves project communication by providing a highly visual, interactive, and transparent channel to convey project-critical timing information. Its strategic placement reinforces a public declaration of commitment, creating an additional layer of communication that conveys the project's dedication to timeline adherence. This amplifies accountability, motivating stakeholders to consistently align activities with publicly committed timelines.

The countdown clock's immediacy and visibility enable stakeholders to readily perceive critical deadlines, fostering a shared understanding of project priorities and time constraints, significantly reducing ambiguity and improving collective decision-making.

4.2.3. Real-world application

The research insights illustrate how the countdown clock implementation significantly impacts GCC construction. Notably, during the project's structural completion, wherein adherence to specific deadlines was critical to avoid contractual penalties, stakeholders frequently consulted the clock, leading to increased proactive discussions regarding resource allocation, scheduling concerns, and risk-management strategies. Upon identifying a potential delay owing to resource constraints, stakeholders quickly addressed it collaboratively, reallocated resources effectively, and adjusted interim timelines, thereby preventing delays and related disputes.

The research findings highlight that the countdown clock's public visibility significantly influences stakeholders' behaviour. For example, during external parties' site visits, the clock's prominent position communicated project timeline commitment. This increased stakeholders' motivation, intensified internal communication, and encouraged swift resolution of potential scheduling conflicts to prevent public scrutiny or reputational risks associated with missed deadlines.

This study also highlights the clock's role in preventing financial and contractual misunderstandings. The continuously updated project timelines directly influenced stakeholders' interactions, encouraging proactive dialogue and pre-emptive identification of potential issues such as delayed payments linked to milestone achievements. As deadlines approached, stakeholders communicated more frequently and transparently to confirm their understanding and commitment, thereby preventing disputes over payment schedules and contractual obligations.

4.2.4. Stakeholder perspectives

The findings indicate that project stakeholders appreciated the countdown clock. Contractors emphasised the displayed deadlines' motivational impact, which improved productivity and resource management. They observed a marked increase in proactive scheduling and communication activities, directly influenced by the visibility and urgency the clock imparted.

Similarly, clients highlighted the clock's effectiveness in ensuring transparency, accountability, and clarity regarding project timelines and deliverables. They reported increased confidence in project progress management and appreciated the proactive risk management facilitated by the clock's visibility. The clients' senior management noted reduced stress and enhanced trust resulting from consistent and transparent communication of project status and timelines.

4.2.5. Communication theory application

Theoretically, the countdown clock operationalises concepts from information richness and communication

accommodation theories. The former theory emphasises the importance of selecting communication channels suited to the conveyed information's complexity and urgency. The countdown clock's visual immediacy effectively communicates high-complexity information (critical timelines, deadlines, and responsibilities) clearly and rapidly to diverse stakeholder groups.

Additionally, communication accommodation theory highlights the importance of adapting communication styles to meet diverse stakeholder needs. The countdown clock addresses diverse stakeholder communication preferences and cultural backgrounds prevalent in GCC projects by providing universally comprehensible visual cues accommodating varying levels of literacy, language proficiency, and technical understanding.

4.2.6. Implications for dispute avoidance

The countdown clock's explicit communication approach contributes significantly to proactive dispute avoidance by minimising ambiguity around critical project milestones and responsibilities. Clear and visible timelines prevent misunderstandings and ensure consistent stakeholder alignment and accountability, substantially reducing disputes stemming from misaligned expectations, missed deadlines, or unclear responsibilities. Moreover, the enhanced transparency and urgency fostered by the clock encourage proactive stakeholder engagement and collaboration, ensuring smoother project execution and stronger stakeholder relationships.

4.3. Artefact 3: Alignment of project managers' key result indicators

4.3.1. Description

Alignment of project managers' key result indicators (KRIs) is a strategic tool synchronising and unifying performance expectations and forward-looking communication-health evaluations across client and contractor project management teams in construction projects. This study highlights its importance in addressing power imbalances and potential conflicts stemming from differing stakeholder motivations. The core objective of KRI alignment is to establish clearly defined, outcome-oriented performance metrics agreed upon by clients and contractors and to foster unified goals and collaboration throughout the project lifecycle. This involves creating outcome-focused KRIs and shifting from traditional key performance indicators, emphasising process-oriented measurements such as schedule adherence and cost management, to broader strategic objectives, including stakeholder satisfaction and dispute avoidance. This shift aligns client and contractor interests, ensuring their collaborative efforts focus on shared, beneficial outcomes rather than individual, organisational goals. Operationally, KRIs are established early in the project at DACA meetings and regularly reviewed to ensure continuous alignment. This artefact involves mutual performance evaluation: The client reviews the contractor's project manager and vice versa. Such mutual evaluation introduces unprecedented transparency, accountability, and cooperative spirit within project teams, significantly enhancing communication effectiveness.

4.3.2. Communication dimension

This artefact's explicit communication dimension lies in its structured, transparent evaluation and feedback processes. Regular, structured communication around KRIs involves documented performance reviews, open

discussions on progress and challenges, and timely and actionable feedback loops. This ensures that both parties understand each other's expectations and promptly address potential misunderstandings, enhancing transparency and accountability.

Moreover, the reciprocal evaluation mechanism supports two-way communication, promotes openness, and fosters mutual respect. This helps break down traditional hierarchical barriers and power imbalances between clients and contractors, enabling candid discussions and proactive problem-solving.

4.3.3. Real-world application

KRI alignment demonstrated substantial practical effectiveness in GCC construction. Introduced during early DACA meetings, the KRIs were carefully crafted, agreed upon, and mutually communicated to project managers. One significant implementation aspect was the explicit expectation of timely and unbiased responses to project queries such as requests for information, payment applications, and notifications of change. Project managers' consistent mutual evaluation reinforced their commitment to these responsibilities, significantly reducing communication-related delays and ambiguities.

Notably, regarding swift resolution of potential disputes from delayed responses to payment applications, regular KRI-based evaluations identified response delays early, prompting direct discussions between client and contractor project managers. This swiftly resolved misunderstandings about payment approvals, ultimately avoiding escalation to formal financial disputes.

4.3.4. Stakeholder perspectives

Stakeholder feedback confirmed strong support for the KRI alignment process. The client's project manager noted that accepting reviews from an external organisation (contractor) initially posed significant cultural and organisational challenges. However, this external perspective quickly became valued for providing unbiased feedback, significantly enhancing their understanding of contractor expectations and improving the parties' working relationship.

Similarly, the contractor's project manager recognised KRI alignment as initially challenging yet transformative. The contractor appreciated the clear communication and feedback mechanisms, acknowledging that mutual reviews improved transparency, trust, and accountability considerably. This mutual understanding significantly helped reduce conflicts and enhance stakeholders' satisfaction throughout the project lifecycle.

4.3.5. Communication theory application

KRI alignment's communication effectiveness aligns with the principles of transactional communication and stakeholder theories. The former theory emphasises continuous feedback loops and active participation amongst communicating parties. The inherent structured, regular mutual reviews fulfil this requirement, facilitating active engagement and immediate feedback, thereby reducing misunderstandings.

Stakeholder theory supports this artefact's significance, highlighting that aligning stakeholder goals and interests through transparent communication significantly enhances collaborative efforts and overall project success. Clearly defined KRIs ensure that clients and contractors share a unified understanding of project objectives, facilitating collaborative stakeholder interactions and proactively minimising conflicts.

4.3.6. Implications for dispute avoidance

Alignment of project managers' KRIs minimises disputes by ensuring transparent communication of expectations, responsibilities, and performance metrics. Precise, outcome-focused evaluations and feedback help pre-emptively identify and address potential misunderstandings or performance issues before they escalate to formal conflict.

The mutual evaluation mechanism uniquely helps dispute avoidance by fostering accountability and reinforcing stakeholder trust. Regular, structured dialogue and clear documentation through KRI reviews establish proactive conflict-management practices, significantly reducing disputes arising from misaligned expectations or performance-related misunderstandings. This structured communication framework minimises disputes and promotes a more collaborative and productive project environment.

4.4. Artefact 4: Escalation mechanism

4.4.1. Description

The escalation mechanism is a structured framework that systematically identifies, addresses, and resolves construction project conflicts by delineating a hierarchy of responsibility and authority. Study insights demonstrate that this typically encompasses a multilevel hierarchy, each level specifically tailored to handle conflicts of escalating complexity or significance. The mechanism explicitly identifies which types of unresolved issues qualify for escalation, defines clear timelines for resolution at each stage, and outlines detailed protocols for escalating unresolved issues through progressively higher managerial or decision-making levels.

The developed mechanism comprises a five-level hierarchical structure. Level 1 deals with day-to-day operational disputes related to the contract performance criteria addressed by project managers. Unresolved issues advance to Level 2, where technical or specialist consultants provide insights. Level 3 escalates the issue to contract managers, who interpret and resolve matters within the contractual agreement framework. At Level 4, the DACA intervenes with senior decision-makers from stakeholder organisations to negotiate resolutions. Finally, Level 5 involves formal mediation or arbitration, as stipulated in contractual agreements, serving as the ultimate resolution stage before legal intervention. The five-level ladder mirrors the disagreement-to-dispute stages; each escalation entry is simultaneously logged into the project risk register, reinforcing the artefact's preventive function.

4.4.2. Communication dimension

This artefact's communication dimension is explicitly structured to ensure transparent, timely, and effective information exchange across stakeholder levels. Clearly defined escalation pathways establish predictable communication channels that stakeholders use to raise concerns, report unresolved issues, and receive timely

feedback. Each escalation level's structured documentation process ensures clear records of communications, decisions, and resolutions, promoting transparency, fairness, and accountability.

Regular updates and clearly defined timeframes for each stage foster proactive and focused discussions amongst stakeholders. This prevents unresolved issues, significantly reducing potential misunderstandings, communication breakdowns, and disputes arising from ambiguity or delayed responses.

4.4.3. Real-world application

The escalation mechanism demonstrated effectiveness in this study. Its structured introduction at a DACA meeting in September 2021 gave stakeholders a systematic method for addressing conflicts beyond risk register entries. Notably, subcontractor performance issues were swiftly resolved at Level 1 through clearly structured discussions facilitated by project managers. Issues initially unresolved at this level were quickly and systematically escalated to specialised consultants at Level 2, ensuring timely and technically accurate resolutions.

Moreover, Level 3 and 4 escalations effectively resolved complex disputes concerning contract interpretations and payments. Regularly documented discussions ensured all stakeholders clearly understood the escalation progress, fostering confidence and reducing project disruptions. The structured timeline—allocating a one-week timeframe per escalation level—was pivotal in maintaining project momentum and swiftly addressing emergent issues.

4.4.4. Stakeholder perspectives

Stakeholders widely acknowledged the escalation mechanism's benefits. Project managers particularly valued the clarity and authority provided by structured escalation levels, enabling rapid resolution and improved coordination. Clients praised the mechanism for significantly improving transparency and fairness, ensuring that decisions were perceived as legitimate and unbiased.

Contractor stakeholders also emphasised the importance of the predictability of the mechanism introduced, noting that clearly defined escalation processes greatly improved their ability to proactively manage potential disputes and allocate resources effectively. Stakeholders unanimously agreed that structured escalation dramatically reduced communication uncertainty and enhanced trust and collaboration across project teams.

4.4.5. Communication theory application

The escalation mechanism aligns with several core communication theories, notably, information richness and transactional communication theories. The former emphasises that the mechanism's structured hierarchy facilitates clear, detailed, and contextually rich communication—critical for effectively addressing complex conflicts within construction projects.

Transactional communication theory validates the mechanism's effectiveness by highlighting the importance of clear feedback loops and active stakeholder participation in communication. Structured escalation levels facilitate

continuous two-way dialogue, ensuring stakeholders actively resolve issues and thus significantly reducing miscommunication.

4.4.6. Implications for dispute avoidance

The escalation mechanism contributes to proactive dispute avoidance by systematically addressing potential conflicts early, clearly, and transparently. Swiftly escalating issues to the appropriate authority prevents minor disagreements from developing into significant disputes.

Moreover, structured and documented escalation pathways reinforce procedural fairness, building trust amongst stakeholders and maintaining a collaborative project environment. Such clear, structured, and timely communication significantly mitigates project disruptions, financial penalties, and reputational risks associated with unresolved disputes, underscoring its critical role in comprehensive dispute management and avoidance strategies.

5. Integrative analysis: Synergistic impact of structured communication artefacts

This integrative analysis examines the collective impact and interrelatedness of the four structured communication artefacts (see Figure 4). Collectively, these four tools intercept issues at different points, transforming isolated events into managed resolutions long before they mature into disputes or claims. Integrated into a single risk-register loop, every DACA action item, KRI variance, and Level-1 escalation is logged so that managers share one dashboard view of emerging issues.

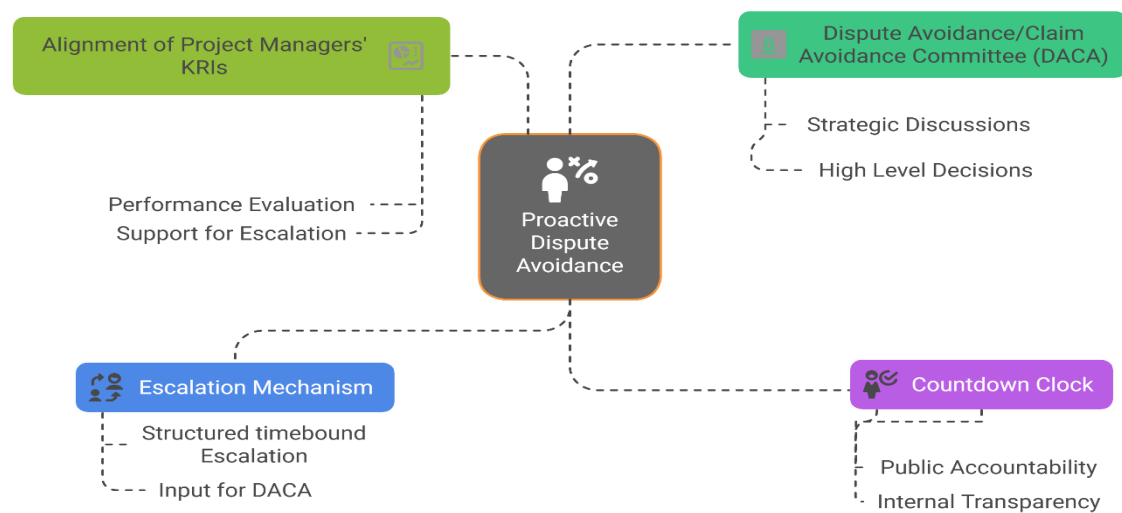


Figure 4: interrelationship of the four communication-centric artefacts driving proactive dispute avoidance

5.1. Complementary, modular functions, and collective coverage

Each artefact is uniquely designed to address distinct yet interrelated communication challenges **and can be deployed on its own, in various combinations, or as part of the full four-artefact suite**, covering the entire

spectrum of project communication. The more often artefacts are deployed together, the more resilient and complete the project's structured communication shield becomes.

Alignment of project managers' KRIs bridges strategic and operational layers by clearly defining and synchronising performance expectations between client and contractor teams, thus fostering mutual accountability. The escalation mechanism provides structured hierarchical pathways for systematic conflict resolution, ensuring that unresolved operational issues are transparently escalated and effectively addressed at appropriate decision-making levels.

The findings illustrate how these artefacts enhanced communication and proactive dispute avoidance. For example, in a project-milestone adherence scenario, the countdown clock's public visibility prompted stakeholders to proactively address delays identified during DACA meetings. Concurrently, aligned KRIs ensured project managers promptly prioritised resolution strategies, utilising structured escalation processes to rapidly resolve issues without disruption.

When these artefacts operate concurrently, they establish comprehensive communication coverage, from routine operational interactions to high-level strategic dialogues, significantly reducing communication lapses, misunderstandings, and subsequent disputes.

5.2. Shared stakeholder engagement and reinforcement

A critical aspect identified is the reinforcement of stakeholder commitment and engagement achieved by collectively implementing these artefacts. Regular participation in DACA meetings reinforces stakeholders' awareness and responsibility at senior decision-making levels. Concurrently, the countdown clock's visual immediacy and public nature strengthen stakeholders' motivation and accountability at the operational level, further reinforcing a culture of proactive communication. Stakeholders explicitly highlighted the positive impact of artefact integration. A senior project manager emphasised that collective implementation dramatically improved transparency and stakeholder accountability, significantly reducing routine misunderstandings. As clock alerts, KRI scorecards, and DACA minutes hyperlink to the same risk-log entry, stakeholders saw a closed feedback loop instead of parallel, siloed reports. Similarly, stakeholders noted enhanced trust and cooperation resulting directly from mutual KRI evaluations and structured dialogues provided by the DACA and escalation mechanism. Moreover, project managers' mutual evaluation, facilitated by aligned KRIs, enhanced stakeholders' trust and cooperation. This created consistent expectations, transparent assessments, and regular structured dialogues, significantly reducing conflicts stemming from unclear roles or performance misalignment. Finally, the escalation mechanism seamlessly combined with these processes, delineating resolution responsibilities and reinforcing accountability across all stakeholder groups.

5.3. Structured communication pathways and feedback loops

The structured and interrelated communication pathways these artefacts provide significantly enhance feedback loops and conflict-resolution efficacy. DACA meetings document discussions, outline responsibilities, and track follow-up actions, ensuring accountability and clarity at strategic levels. Similarly, the countdown clock provides

real-time visual updates, enhancing stakeholders' awareness and fostering prompt communication regarding scheduling or resource concerns.

Mutual evaluations through aligned KRIs establish clear communication expectations and regular feedback, quickly addressing performance-related misunderstandings before escalation. The escalation mechanism defines precise timelines and structured protocols for raising and resolving issues, ensuring stakeholders receive timely and contextually rich feedback, thereby reducing delays and fostering proactive communication.

This study underscores that these communication pathways' structured integration resulted in measurable improvements, such as reduced formal disputes and more efficient issue-resolution timelines. The clearly defined escalation paths and structured regular interactions through DACA and countdown-clock visibility significantly enhanced stakeholders' proactive engagement and potential disputes' resolution.

5.4. Mutual reinforcement of accountability and trust

These artefacts' combined implementation reinforces stakeholder accountability and trust [32]. The countdown clock fosters public accountability and directly supports the transparency and proactive accountability emphasised in mutual KRI reviews and DACA dialogue. Furthermore, explicit transparency and structured documentation integral to the escalation mechanism significantly enhance procedural fairness and stakeholders' confidence in dispute-resolution processes.

Findings indicated that historical challenges within GCC construction typically involved fragmented communication, delayed resolutions, and mistrust between stakeholders. The integrated artefact approach effectively addressed these issues by promoting transparency, accountability, and proactive stakeholder engagement. Stakeholders in this study explicitly recognised these historical improvements, noting enhanced trust, reduced tensions, and increased satisfaction compared to projects without structured communication mechanisms.

This study emphasised that structured accountability across all artefacts significantly enhanced stakeholders' trust, fostering a collaborative rather than adversarial project environment. The consistency and transparency of this integrated communication framework significantly reduced relationship strain and misunderstandings, leading to greater overall project efficiency and stakeholder satisfaction [2].

5.5. Cross-regional lessons

The GCC dispute profile mirrors conditions that triggered the UK's 1990s industrial reform. Faced with chronic overruns and adversarial contracts, the Latham [33] and Egan [34] reports championed partnering [35], early stakeholder integration, and statutory adjudication. Egan forecast that collaborative work would reduce overall costs by 30% and project duration by 80%—a prediction borne out by Tesco's national retail rollout, which reduced capital costs by 40% during 1991–1998. Central to these gains was a shift from reactive dispute resolution to proactive dispute avoidance, enforced through clear contract language and a fast-track adjudication lane that preserved cash flows across the supply chain [36]. The four GCC artefacts in this study echo the UK's trajectory by institutionalising face-to-face communication, transparent performance metrics, and short decision windows.

Whilst legal cultures differ, the UK experience demonstrates that codifying early intervention pathways and equitable risk allocation can reduce dispute frequency and improve delivery predictability—outcomes equally pressing for the GCC megaproject pipeline.

6. Practical recommendations, managerial implications, and academic contributions

6.1. Generalised application

Collectively, the four communication-centric artefacts offer a scalable playbook for project executives. Used together, they (1) surface latent issues within one reporting cycle, (2) assign clear ownership and deadlines, and (3) escalate only unresolved items to a CEO-level DACA forum where binding decisions are logged in the shared risk register. This pathway can be attached as a schedule to engineering, procurement, and construction or design-build contracts, helping organisations pre-empt costly disputes whilst preserving strategic relationships.

6.2. Embedding structured communication artefacts in practice

Stakeholders must explicitly embed structured communication artefacts in contractual agreements and project governance frameworks. For example, the DACA should clearly define roles and responsibilities in the project's formal documentation. Scheduling of DACA meetings on a **monthly** cycle (or ad hoc) should be codified as a contractual obligation, with all actions tracked in a shared log and progress reviewed in the next session.

The countdown clock should be mandated in contractual documentation as a central operational monitoring tool explicitly positioned to ensure public accountability and transparency. Project contracts must specify the exact placement, update intervals, and responsibilities for maintaining the clock, reinforcing precise accountability mechanisms.

Alignment of project managers' KRIs requires explicit specifications within contracts and governance documents. Contracts should include clearly defined evaluation criteria, review schedules, and mutual feedback mechanisms. This ensures accountability, transparency, and regular proactive interactions between clients' and contractors' project managers.

The escalation mechanism should be documented explicitly within governance policies, outlining escalation paths, timelines, and resolution responsibilities. Contractual clauses must stipulate structured communication requirements at each escalation level, ensuring effective and timely conflict resolution.

Outputs from every artefact should flow into a single, project-wide risk register so that senior managers have one dashboard view of emerging issues.

6.3. Training and skill development

Effective deployment of the four artefacts hinges on role-specific capability building. A concise orientation should link each tool to its five-stage DSR rationale so that teams understand the iterative-improvement logic:

- Senior executives: strategic conflict management via DACA.
- Project managers: countdown-clock governance and KRI alignment.
- Operational teams: daily transparency and escalation triggers.

Workshops must reinforce structured communication protocols, documentation standards, and dispute-resolution pathways. We adopt Gamage's [37] three-step routine—Plan (map stakeholders and channels), Optimise (tailor tone, timing, medium), and Manage (check-ins, receipt verification, conflict capture)—to embed these skills.

6.4. Cultural and organisational adaptations

Effective utilisation of structured communication artefacts within the GCC context necessitates cultural and organisational adaptations. Stakeholders must understand cultural norms influencing communication dynamics, such as indirect communication tendencies and hierarchical decision-making practices in the GCC.

Management strategies must explicitly accommodate these cultural nuances. For instance, artefact implementation guidelines should incorporate mechanisms respecting local hierarchical structures whilst promoting transparency and accountability. Additionally, management practices should encourage culturally sensitive yet transparent feedback channels, specifically addressing potential barriers to open communication within GCC organisational structures.

6.5. Policy adaptations

Explicit policy adaptations are required to successfully implement structured communication artefacts. Policies should define structured documentation standards, escalation procedures, and responsibilities within project governance frameworks [2,38]. Policy language must specify the DACA cadence, real-time countdown clock's mirroring to digital dashboards, and risk-register integration points. Explicit policy statements mandating regular reviews and updates of communication structures ensure continuous adaptation and alignment within evolving project contexts.

Articulated policies outlining periodic artefact evaluations and effectiveness reviews are essential in ensuring artefacts continuously align with project realities and stakeholders' expectations. Structured policy frameworks explicitly supporting proactive communication practices reinforce artefact effectiveness across multiple project phases.

6.6. Implications for academicians

6.6.1. Theoretical contributions and innovations

This study contributes to construction management theory, particularly the structured communication and proactive dispute avoidance literature. The integrated artefact framework significantly enhances existing theoretical models by demonstrating practical applicability and effectiveness within the GCC construction

context. This represents a clear theoretical innovation, moving beyond traditional reactive dispute-resolution methodologies towards proactive structured communication mechanisms.

6.6.2. Augmenting research

The study explicitly fills critical research gaps, particularly regarding proactive contract design, structured communication clarity, and stakeholder collaboration strategies within GCC-specific contexts. Demonstrating integrated structured communication artefacts' effectiveness advances theoretical understanding and provides empirical evidence supporting proactive dispute avoidance strategies.

6.7. Future research directions

Academics should pursue empirical validation of these structured communication artefacts across diverse project environments and geographical regions. Explicit research opportunities include comparative studies evaluating artefact effectiveness in different cultural and organisational contexts and exploring these communication frameworks' adaptability across varying project types and complexities.

Furthermore, theoretical research should explore these structured communication mechanisms' integration into broader project management methodologies, thereby enriching academic discourse and practical management guidelines. Scholars can investigate the scalability, long-term adaptability, and continuous refinement of structured communication frameworks, contributing to robust theoretical development within construction management.

7. Conclusion

This study's integrative use of structured communication artefacts demonstrated transformative potential in proactively addressing the root causes of construction disputes. Although each artefact provides independent tangible benefits, their integrated use magnifies these benefits, ensuring comprehensive, structured communication coverage across all project levels. These artefacts shift stakeholder interactions from reactive conflict management towards proactive dispute avoidance, significantly improving overall communication effectiveness, stakeholder alignment, and project outcomes whilst providing a transparent audit trail and converting latent dispute triggers into formally managed risks. Therefore, these artefacts' synergistic effect underscores their critical value as integrated communication strategies in construction management.

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