

Project Governance & Controls Annual Review 2020



Management, Surveillance and Quality Assurance; Adding value independent of contract conditions to the post COVID-19 recovery

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Abstract

The construction industry recognised many of its shortcomings from experiences of the global financial crisis (GFC) of 2008 and modified many of its practices. However, in some areas outdated practices still persist. Other industries responded by moving to a value-added or client-centred approach to deliver products and services. The return from current COVID-19 lockdowns across the world presents a new opportunity for the construction industry to reform, with governments seeking to fund large "shovel-ready" infrastructure projects to boost their economies.

"Project 13", is the latest initiative of the Institution of Civil Engineers (ICE) to target a revival of a value-based approach, which should be the focus for ensuring sustainable recovery from the current crisis. The principles of Project 13 are highly transferrable to the construction industry in New Zealand and particularly to public sector infrastructure delivery models. Projects in the infrastructure sector in Auckland have looked to innovation to assist with the demands to accelerate pre-construction phases. Through the deployment of new "digital" technologies in design, schemes have been taken to market in record time. This paper discusses firstly whether acceleration has negatively impacted the traditional measures of project success, i.e. time and out-turn cost and secondly, how experienced Management Surveillance & Quality Assurance (MSQA) professionals can manage the effects of over-reliance on technology.

The MSQA team, as independent advisors to the parties of the contract can assist to facilitate an ethical approach, through constant questioning of each stage of the design and construction process. Such an approach, particularly in contract administration can ensure that ideas are appropriately scrutinised and also control the potential for 'Group Think'; The forcefulness of influential personalities, or the desire for cohesiveness in a group that may produce a tendency among its members to reach a consensus decision without critical evaluation. Similarly, basic design

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flaws and construction methodology fundamentals can be overlooked when project resources are stretched and the protection afforded by an additional layer of oversight, to identify design, quality or construction errors, becomes vital.

This paper will investigate how the involvement of a dedicated MSQA team, over successive project phases, can assist to maintain continuity, consistency and comprehensive handover between project participants. Transitioning the same MSQA resource/s into construction supervision and the Engineer's Representative role, can be a key enabler to 'on time' and 'on budget' delivery of projects. Responsiveness to the complex and evolving contractual issues stemming from COVID-19 inactivity and the subsequent recovery efforts, may also be improved. Integrating this overall approach with a value-based procurement model will further strengthen an ability to efficiently address client inputs throughout the lifecycle of projects, irrespective of the chosen delivery model.

The paper will be organised in the following sections:

- Construction clients as drivers of productivity
- NZS3910:2013 and delivering better behaviours from project participants
- Risk allocation and its importance in post COVID-19 recovery efforts in New Zealand
- Digitisation

Keywords: Project 13, Risk Allocation, MSQA advisor, Group Think.

1. Introduction and literature review - Construction clients as drivers of productivity

Research undertaken by the International Monetary Fund (IMF) has shown that increasing investment in infrastructure by a single percentage point of GDP increases the level of output by 0.4% in the same year and by 1.5% four years after (IMF (2014) World Economic Outlook: Legacies, Clouds, Uncertainties). Construction clients are considered as the major steering force for directing construction processes and results (Ryd, 2004). Single clients do not however have the leverage to change the practices of an industry. To change the industry, a national strategy is needed. The British government led transformation plan in the early 2000s resulted most significantly in industry benchmarking and endorsed project & program management processes. A redefined procurement process approach was also introduced in a bid to move from cost-based to value-based, yet resistance to change has persisted. The process in which client needs are translated into requirements, then drawings and specifications, has barely changed in several decades. This process has been succinctly analysed (Forgues, 2005); Potential reasons included poorly integrated delivery mechanisms & supply chains and the bureaucratic framework of professional practice. One conclusion was that incentives to improve have also stagnated, with procurement choices continuing to be based on the lowest bid, with innovation frequently considered as an additional risk and consequently disincentivised. Unfortunately, over fifteen years later, the situation arguably remains relatively unchanged.

The Institution of Civil Engineers (ICE) introduced 'Project 13' as a flagship initiative supported by the 2019 World Economic Forum's; Platform for Shaping the Future of Cities, Infrastructure and Urban Services. Traditionally "separating design from construction and breaking projects down into hundreds of sub-contracts we impede the flow of knowledge from the supply chain to the front end of the project where value is created, adding cost and uncertainty at every step along the way"

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(Project 13). The key shift required as part of Project 13 thinking, is the adoption of “Enterprise delivery models”; moving away from transactional, cost-driven procurement to the creation of value-driven, collaborative business to business partnerships collectively focused on integrating capabilities to deliver outcomes. Project 13 is an example of several programmes already being implemented internationally to address long-standing issues within the construction industry that will not have gone away in the wake of the COVID-19 pandemic.

Early client adopters of Project 13 are placing a greater emphasis on delivering better outcomes for their customers and accordingly selecting and integrating partners into high-performing teams with the right technical and behavioural capability to deliver. Post COVID-19 recovery efforts are only likely to heighten pressures on client resources and in-house expertise to clearly define desirable asset performance, for infrastructure to ultimately operate as a resilient and interconnected network of roads, railways and utilities. In the White Paper Covid-19 and the new normal for infrastructure systems – next steps, the ICE promotes the use of digitisation programmes to allow a better understanding of assets in use. The UK ‘National Digital Twin’ concept amongst others, has the potential to enable more effective collection, analysis and use of data to enhance infrastructure performance in the different economic scenarios that may occur following the end of the pandemic.

Multi-skilled MSQA advisors can be strategically engaged to assist to drive projects from conception to delivery more quickly. Accordingly, advisors will be required to be increasingly knowledgeable in construction technology, construction law, conditions of contract, contract administration, project-planning systems and the psychology of negotiations. The demand for such skillsets will become more pronounced where the design of infrastructure conceivably also shifts focus, to respond to expectations for our infrastructure to provide more support for societal resilience and ensure whole-life benefits are spread as widely as possible.

1.1 Procurement and contracting strategies for rapid progression from concept to delivery

During this period of extreme uncertainty, where the risk of change events in normal procurement would cause delays and cost overruns, a blend of procurement and contracting strategies from multiple client groups may be necessary to ensure success. Equally, internal organisational structures and processes do not always allow uncomfortable lessons to be learnt from past mistakes or eliminate the risk of systemic issues going unnoticed. Independent, external resources will need to offer capabilities to not only support the management of client requirements but challenge internal perceptions of value and risk.

Ultimately, procurement and contracting strategies and corresponding Request For Tender (RFT) information & requirements should not be asking for more than what is clearly attainable, substantiated and justifiable, with a clear knowledge of the local market. In New Zealand, this includes recognition of the significant complexities of certain requirements, notably such as 30 year guarantees & performance bonds. External MSQA advisors when engaged pre-construction will need to be particularly investigative and meticulous in developing a clear understanding of changing client needs. To then concisely translate these needs into specifications, Principal’s or Minimum Requirements (PR’s or MR’s), aimed to deliver the best value for money and the best balance of quality and whole life cost to meet end-user requirements. Contract documentation should however be developed with a simultaneous understanding of the contractor’s position and view i.e. Why should a contractor enter this contract? What are the inherent project risks and opportunities to strengthen the contractor’s position?

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1.2. Proactive contract administration and efficient management of change

Best practice would suggest meeting with stakeholders at the outset of any project to arrive at a specific process and then compile a committee to represent both sides of change requests. Irrespective of the stage of the project's lifecycle, in the current environment projects that are perceived to be isolated are unlikely to be tolerated and escape interrogation. The immediate future is likely to see a demand from stakeholders, for wider interconnectivity between infrastructure networks, then maintenance of the interconnected system to deliver long-term sustainability and whole-life benefits.

The client's representative often acts as decision maker, to examine and then approve or deny all requests for scope change that inevitably occur on projects, whilst taking extra care of the important time obligations of the contract. The key to successful change management will always be proportionate to the ability to provide overwhelming supporting documentation to back up the cost and schedule impacts to the project. The Resident Engineer, or often the Engineer's Representative in New Zealand (NZS 3910 Conditions of Contract) is uniquely positioned across the design and project management/ client advisory functions, to cultivate trust between stakeholders and to assimilate informative guidance for the client's project manager/s accordingly.

Stalled project progress at any stage will be particularly toxic to recovery efforts post COVID-19 and after the recognition and acceptance of change requirements, skilled contract administration involves proactively evaluating and processing associated variation concerns promptly. Claims management is however often wrongly seen as adversarial, where instead maintaining cordial relationships will be central to successful outcomes in the current climate. Claims management should consider that it is best to be consistent, to be holistic and to also recognise that there may be a chance to leverage one claim against another. Clarifying requirements early, with a local knowledge of contractor capabilities will also prevent unnecessarily lengthy periods for generation of a variation or extension of time claim. Contractor resource availability will seldom be insufficient to prepare legitimate claims comprehensively, in short order. Delay in submission often results in aggregated time and cost implication claims and the re-litigation of any disruptive affects, that economic recovery efforts can ill-afford. The effect of any intervening or contributory conduct by the client on the time period, and how the process interfaces with any 'early warning' provisions are however important considerations to be evaluated. Relevant considerations do also include whether the knowledge test is objective or subjective, in which case a 'two-stage' notice and resolution process may be appropriate.

1.3. Changing the Basis of Payment and reward

The COVID-19 pandemic has served as a lesson for supply chain resilience and irrespective of the delivery model chosen, a key component of contract documentation in directing a focus on the items of most importance to the customer, is the Basis of Payment (BOP). Payment guidelines can unfairly enforce excessive cashflow constraints on the contractor, by linking payment release solely to progress in the field. Poorly targeted attempts to protect the client's interest through indiscreet payment terms, may result in excessive front-end loading or similar strategies that will not ultimately be conducive to achieving rapid progress and performance on projects. Monitoring and controlling functions/ options for the client and their advisors are critical to ensure early warning of project weaknesses and impending failure. The early submission and approval of contractor's management plans and meaningful progress reports for instance, are fundamental monitoring tools

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in the best record keeping processes that can be promoted effectively through targeted payment mechanisms.

Going a step further and utilising a similar approach as championed in Project 13, reward for out-performance against baselines or benchmarks may be sought in devising contract documentation/ project requirements, to ultimately include a return for generating value related to outcomes. This back to back commercial arrangement is defined by Project 13 as an important step in creating aligned “Enterprise relationships”; a governance framework that enables effective and collective decision-making, with high levels of transparency and layers of assurance built into the process, ensuring that quality of outcome remains at the core of the enterprise’s objectives.

2. NZS3910:2013 and delivering better behaviours from project participants

A universally applicable standard form contract is arguably not realistic. More attention should potentially be placed on ensuring a contract which is up-to date, user-friendly and principles-based. This will successively enable flexible application, or with additional prescriptive requirements on a project specific basis to be applied using Special Conditions of Contract. Most importantly, industry needs a contract that facilitates better behaviour from project participants, particularly in these difficult times.

To further streamline conception to delivery, in the absence of a few currently heavily debated updates to the current NZS 3910 Conditions of Contract, Special Conditions are likely to remain integral to developing robust, project specific RFT documentation for some time. Whilst there is often a need for a legal position on the conditions of contract, and special conditions in some circumstances, lawyers should not be drafting the Principal’s Requirements or project specifications. The flexible allocation and opportunity for additional prescriptive requirements must therefore be thoughtfully applied, potentially to:

- Rectify some of the known glitches and shortcomings of the general conditions (for example, certain definitions, time of entry into the contract, rules of assignment, preparation and review of documents);
- Introduce some additional optionality (such as liability caps for contracts, standard exclusion of consequential and economic loss wording, for instance); and
- Reflect current law (such as the Health and Safety at Work Act 2015).

Despite the above requirements, it should not be an unnecessarily difficult or convoluted task to properly understand the contract, with enough time allocated for pre-execution due diligence to be undertaken. It is also important that the contract documents do not contradict each other. There should otherwise not be any reason to present a contract for tender that is clear and transparent in its terms, and which is either consistent across its component parts or which has clearly defined rules for dealing with inconsistency. An MSQA advisor with overlapping knowledge of the design and planning/ consenting of the project, tendering/ tender evaluation phase, is frequently well placed to understand and coordinate all of the contract documents and therefore to later undertake the role of Engineers Representative. When appointed as a representative of an Engineer to the Contract selected from a pool of accredited individuals independent of the designer, this organisational structure ensures impartiality and is arguably both practical and efficient for the client.

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3. Risk allocation and its importance in post COVID-19 recovery efforts in New Zealand

Where there is uncertainty, there is risk. Common project risks include weather, ground conditions, labour markets, defective work or materials, inadequate design, incorrect estimating, incorrect programming, natural disasters and not least pandemics such as COVID-19.

Properly understanding the drivers, position and status of each party to the contract is key to achieving fair risk allocation. It is necessary to allocate risk project-by-project, in a realistic, transparent and informed way. The consequences of project risks are invariably realised in contract physical works defects, the time for completion of the contract works and/or the amount payable for the contract works. The current debate is about which party should bear responsibility for identifying, managing and mitigating such risks and which party should bear the consequences of those risks.

When managing the procurement process, transparency in all dealings between the parties to the contract is needed. Appropriately tailored risk allocation, which is properly understood, should be supported by clear, unambiguous obligations within technical specifications, Principal's Requirements or other documentation. Skilled MSQA advice can assist to bridge the gap between design and contract/ construction requirements in developing technical specifications. Requirements around materials testing for instance, should also consider local industry capabilities, recognising that certain requirements are only achievable offshore, and their necessity therefore needs to be carefully scrutinised.

3.1 Transparent contract documentation - tackling a consolidating supply chain

With a consolidating supply chain in the aftermath of COVID-19 inactivity, head contractor's committing to fixed price and tightly programmed contracts, are liable to find their expectations of subcontractor pricing and availability are exceeded due to the excess demand over supply in the industry. Those costs are absorbed by the head contractor, who will see their relatively small margin quickly disappear, leading to solvency issues for themselves and eventually their subcontractors.

Fair risk allocation is integral to supply chain resilience and can arguably only occur after the contracting parties are given the opportunity to discuss the terms and conditions of the contract before they are finalised. This will lead to agreed strategies to mitigate risks and an open conversation about which party is best able to manage the residual risks. In the absence of pre-agreed terms, particularly when acting as an independent expert, the MSQA advisor can add value through the application of nuanced, pragmatic and innovative approaches to risk allocation. It is incumbent on each party to the contract however, to make sure it properly scopes and understands each risk allocated to it. A prudent party to the contract should therefore only accept a risk if it accepts the consequences of that risk on an informed basis. If the commercial drivers of a party are such that it is willing to accept an unwise risk allocation, there should then be no expectation for the Engineer to provide a contract direction that later points at the counterparty. Fairness arguably cannot be enacted in the later stages, through contract administration, as the allocation has already become effective by each party accepting the risk by executing the construction contract and binding themselves to the terms of that contract.

In New Zealand, initiatives such as the 2018 Entwine Report and the industry-led New Zealand Construction Sector Accord, are beginning to garner interest in the market and will potentially drive significant change to observations of a large share of project risk held by the contractor in many current contracts. As is captured by one of the four, key guiding principles of the Construction Sector

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Accord; 'build trusting relationships', there is clearly a need to devise efficient ways in which risk can be allocated on a basis which is transparent and objectively fair. It should also be recognised that this will not be the resolution of all contractual problems. If a contract is awarded primarily on the basis of price, then this amplifies the potential for greater risk and loss to be passed through the contracting supply chain. There is evidence of the public sector's commitment to move away from lowest price procurement, in line with the Accord principles, which now shows consistency with the latest edition of the Government Procurement Rules.

3.2 Buildability and early contractor involvement

Quickly progressing to delivery phases will assist to unlock the benefits of the public spending programmes necessary to alleviate a dislocated economy and risk of mass unemployment. Provided that permanent works design is pre-completed to a fully compliant level of detail, then arguably a build-only contractor is best placed to assess buildability and construction phasing. Where sufficient opportunity is given to the contractor to review the design and all other relevant information, including conducting site-visits, a well-conceived procurement strategy may facilitate earlier contractor involvement, unlocking benefits to all parties. Locking down the design phase much earlier may allow the manufacturing, assembly, testing and commissioning phases to be compressed and run in parallel, rather than in a long, linear sequence, driving greater efficiencies in how resources are mobilised. It is important however that buildability responsibility is distinguished from Safety in Design (SID) responsibility, the latter of which should rest with the design consultant in a build-only context.

Any allocation of buildability responsibility needs to be pegged to the specifications or the design. An open-ended, immeasurable responsibility to ensure buildability is effectively a quasi-transfer of design risk, as the line between responsibility for design and responsibility for construction is blurred. The nature of buildability is such that, where it becomes an issue, there is often a degree of overlap between the responsibility of the design consultant and the build-only contractor. Where this responsibility turns to liability, it is logical and fair that, to the extent practicable, that liability should be attributed on a proportional basis and any claims framed accordingly.

It is also important that design changes post-tender are properly and completely disclosed to the contractor, with the contractor then being given an appropriate opportunity to review any buildability issues arising out of that change. As an extension of the designers SID procedures and/or handover for construction, a forum or mechanism should be put in place as a component of this process and when facilitated by an experienced practitioner can allow constructability issues to be identified and dealt with. The contractor should be liable for any issues they fail to flag. The principal should be liable to arrange the design to be changed for issues flagged.

Ultimately, an integral part of the Engineer's Representative's role under NZS 3910 Conditions of Contract, is the control of response times and concerns with contractor-submitted requests for information, contractor requests for material-submittal approvals, change management requests, design and constructability requests and procurement approvals. The Contractor however retains a responsibility to ensure compliance with the project specification requirements, including the initial interpretation of supplier's submittals/ proposals/ testing, arguably applying a buildability perspective. Requests for information are traditionally routed through the design team for responses & feedback and should be closely examined by the Engineers Representative prior to transmitting back to the contractor. Inevitably design team changes will occur between design, tender and implementation phases of projects, requiring an overarching/ overlapping involvement

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of a dedicated MSQA team resource to maintain continuity and handover between phases. This will enable appropriate challenge of contractor requests and the designer's responses, accordingly, reflecting on the final contract conditions, contractor's tender, the developed design intent and overall client requirements.

4 Digitisation

The ICE civil engineering blog; Why civil engineers should feel a 'chronic uneasiness' about their work details how rapid delivery aspirations and excessive digitisation combined and resulted in the failure of the Florida International University Bridge in the USA. Investigations revealed that no action was taken despite the visual evidence of severe cracking, because the computer model was not predicting a failure. An argument can be made for an approaching industry wide over-reliance on computer-generated solutions. There similarly remains the danger of projects becoming a victim of "Group Think" mentality, that may stem from a possible over-reliance on technology; Where influential personalities within the project team are often able to force consensus for the benefit of progress or protecting particular interests, despite misgivings and technical expertise that advises against certain actions. The team moves forward as a group in the worst-case scenario, with underlying, basic design flaws and a lack of oversight by every party that had responsibility to identify errors. Particularly in MSQA advisory roles, professionals with the right ethical approach are needed to form collaborative teams, who are constantly questioning the trajectory of the project to avoid getting sucked into 'group think'.

Building Information Modelling (BIM) is now widely used across the industry but with varying degrees of success and frequently not consistently throughout project phases. Unfortunately, BIM is also often only applied in a collection of projects without recognising the need for infrastructure to operate as a system of systems. 3D modelling undoubtedly has benefits in simplifying the complex interrelationship between engineering disciplines through visualisation. The extension of such techniques into construction supervision systems will also therefore extend benefits to the construction phase, by allowing inspectors to intuitively understand the design intent and interim construction staging before construction commences. This process will ultimately enable more comprehensive and targeted inspections, relieving concerns of potential omission or negligence and alleviating the use of standard documents without project-specific review and bespoke inputs.

Conclusion and next steps

The establishment of a pipeline of anticipated government infrastructure projects by the New Zealand - Infrastructure Transaction Unit is a step in the right direction. It could help provide those in the industry with the confidence needed to invest, to drive recovery from the disruptions caused by the COVID-19 lockdowns. The pipeline needs to be further developed and its success is contingent on public sector agencies adhering to it (irrespective of short-term electoral cycles). Without that, it is unrealistic to expect industry to rely on pipeline commitments and to invest based on them or to seek to enable greater use of off-site manufacture and progress developments to enhance industry productivity.

The rapid progression of projects from conception to delivery phases will be key to unlock the potential that large public spending programmes have for economic relief and for the prevention of mass unemployment. Many of the discussion points in this paper promote the uptake of key

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principles from pre-established industry initiatives such as the Institution of Civil Engineers' Project 13. These initiatives were devised to address long-standing issues in the construction industry that have only become more relevant in ensuring sustainable recovery from the COVID-19 pandemic.

During this period of extreme uncertainty, preparing a project and contract for tender that is clear and transparent in its terms, and which is either consistent across its component parts or which has clearly defined rules for dealing with inconsistency, is considered a fundamental prerequisite for success. Key steps to achieving this, fast-tracking projects for delivery and subsequently safeguarding the interests of all parties to the contract, are concluded as follows:

- It is incumbent on those practitioners engaged in the development of contract documentation to take care to intimately understand and articulate client requirements through the Request for Tender project documentation. The target should be presentation of a package of information for delivery of the best value for money, and the best balance of quality and whole of life cost to meet the end user's requirements. Effective 'non-price attribute' evaluation of tenderers can then occur to ensure that contracts and supply arrangements are put in place with organisations who can demonstrate their commitment – either by direct investment or collaboration with specialists, to strive for the real objectives of the client body.
- Requests for change throughout any stage of the project are inevitable, but potentially major roadblocks for efficient performance and programme delivery. Change should be proactively managed with early decision making. This approach should subsequently be applied throughout all successive phases of the contract administration of variation requests, accordingly, concisely delivering and evaluating overwhelming supporting documentation to back up the cost and schedule impacts to the project
- Applying a nuanced, pragmatic and innovative approach to risk allocation is integral from the outset and to ensuring supply chain resilience. Irrespective of the delivery model chosen, it is necessary to allocate risk project-by-project in a realistic, transparent and informed way. This approach should be consistently reflected throughout all key contract documents, including the basis of payment, liquidated damages and Special Conditions.
- Using established technologies can address weak productivity growth in delivering projects and programmes within the construction industry. Broadly, as outlined in the ICE White Paper Covid-19 and the new normal for infrastructure systems – next steps; a structured approach to managing data about infrastructure networks as a whole, will allow new investments to be assessed in the context of how that new asset or system fits in with the existing infrastructure system and what the interdependencies and cross-sector impacts are. More specifically, 3D modelling and the use of Building Information Modelling (BIM) technology to develop a virtual library of high value products for use across a range of future projects and programmes, will be key enablers for efficiency gains. Ownership of buildability responsibility and extending the use of BIM from simply laying out project design, into construction supervision, will also improve processes, reduce errors and eliminate disputes.

Further specific benefits can be realised in engaging skilled, independent Management Surveillance & Quality Assurance (MSQA) advice in the industry's post-COVID-19 recovery phase. Irrespective of the contract conditions, the potential added value of such assistance is considered to be wide-ranging and is summarised as follows:

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- Devising appropriately tailored risk allocation, which is properly understood and supported by clear, unambiguous obligations within technical specifications, Principal's Requirements or other contract documentation.
- Bridging the gap between design and contract/ construction requirements in developing technical specifications.
- Inevitable team changes between design, tender and implementation phases of projects may be supported by the overarching/ overlapping involvement of a dedicated MSQA team resource, to maintain continuity and handover between phases. This will enable appropriate challenge of contractor requests and the designer's responses, accordingly, reflecting on the final contract conditions, contractor's tender, the developed design intent and the overall client requirements.
- Supporting the management of client requirements whilst challenging internal perceptions of value and risk.
- Mitigating poorly targeted attempts to protect the client' interest through indiscreet payment terms. Consequences may otherwise be excessive front-end loading or similar strategies that will not ultimately be conducive to achieving the rapid progress and performance demands of recovery strategies.

Particularly in MSQA advisory roles, professionals with the right ethical approach will be needed to form collaborative teams, who are constantly questioning the trajectory of the project to avoid getting sucked into a 'Group Think', in the interests of driving projects from conception to delivery more quickly.

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