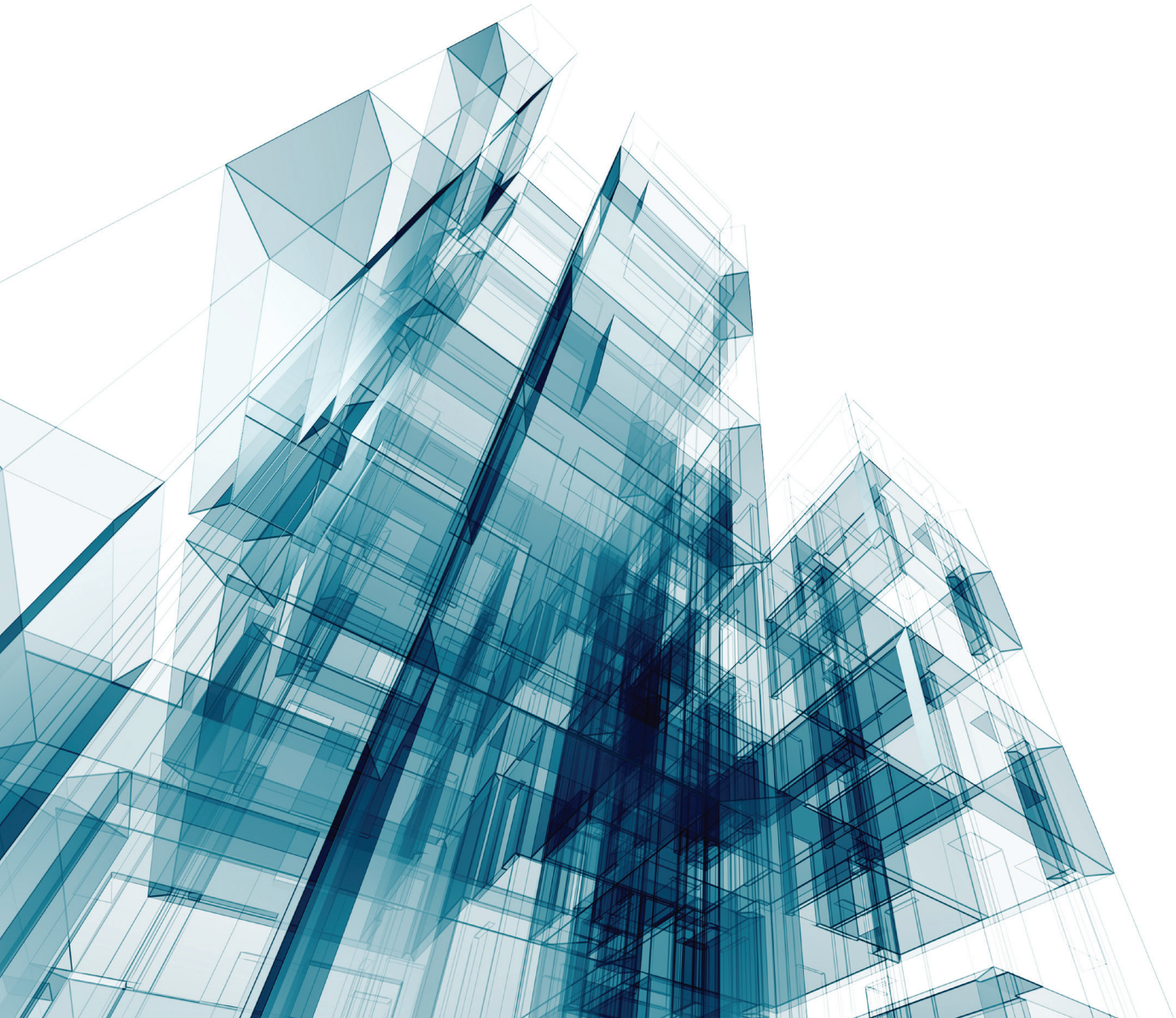
RICS guidance note

RICS professional guidance, Global

Lessons learned

1st edition, April 2016



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Contents

RICS professional guidance

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1 Introduction

1.1 Purpose

This guidance addresses the factors that contribute to project failure throughout the project life cycle and the importance of learning lessons to avoid repeating mistakes in the future. Although the primary focus is the built environment, case studies and lessons learned are drawn from across different sectors.

The arrival of *Lessons learned*, 1st edition also coincides with a recognition that more and more, chartered surveyors are becoming involved with organisational change management programmes and projects, where invariably there will be a property element. It also stresses the importance of capturing the knowledge acquired during the planning and delivery of a project, and making best use of this for the benefit of future projects.

The publication looks at the technical and human aspects that contribute to project failure and success, and suggests practical approaches to help embed a lessons learned culture on a project from the start, e.g. through the use of project closure tools or reality checks at key stages. It considers all stakeholder perspectives and explores the 'softer' side of project management in terms of knowing when to say 'enough is enough', and holding key conversations with 'difficult' stakeholders or sponsors to get the project back on track.

Additionally, there are references to current thinking and best practices acquired from leading texts, reports, research papers.

1.2 Background

There are a variety of factors that may cause a project to fail. The RICS guidance note *Stakeholder engagement*, 1st edition (2014) points out that although projects will undoubtedly face technical challenges, it is often 'human factors' that are the most likely causes of problems or failure. These issues may stem from bad communication, a lack of project management skills, poorly articulated priorities or a failure to integrate with the organisation's key strategic priorities. Other often-cited reasons include a lack of planning or scheduling, and resources and activities without quality control.

These causes of failure relate to all project types and sectors (IT, Infrastructure, buildings, organisational change management, etc.) but the lessons learned can be applied to any project, large or small, and in any sector. There is much evidence available for reference, especially in connection with major projects.

Take the Scottish Parliament building as a recent example, where cost overruns and design problems were much publicised through Lord Fraser's *Holyrood Inquiry* (September 2004). Much less publicised in this case, however, was the excellent *Auditor General's Report* on planning and project management that clearly articulated many lessons learned. The conclusions of this report could well be used as a 'how to' reference for any significant building project, informing project governance, risk management, cost management, project leadership, procurement strategy, etc.

Yet, how many projects are completed without taking stock of what worked and what did not? How many risk registers are 'seeded' with reference to lessons learned from previous projects?

The knowledge generated by every project and the lessons learned (good and bad) are often lost when the project finishes and the team disperses, unless effort is made to capture this valuable information. And even when lessons learned exercises are done at the end of the projects, more often than not, those captured lessons are either not communicated or shared for future project teams or managers to benefit from. This renders the time spent capturing lessons of no benefit to anyone. It is therefore important to establish a process whereby all lessons learned, are approved, stored and used.

2 Project failure or success?

2.1 The nature of projects

Each construction, infrastructure or engineering project is unique. Even if the same drawings, specifications and project teams are used to create 'identical' buildings there will still be factors particular to each. Site conditions, weather and other variables will also contribute to the 'uniqueness' of each building. The Association for Project Management (APM) provides a useful definition of a project:

> 'A project is a unique, transient endeavour, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is usually deemed to be a success if it achieves the objectives according to their acceptance criteria, within an agreed timescale and budget.' (*APM Body of knowledge*, 6th edition)

The increased appeal and use of factory controlled, pre-fabricated construction and a drive for standardisation across an asset class may reduce risks over the 'traditional' construction process and increase the probability of a successful outcome. However, even these approaches have their own risks and hold the potential for learning and improvement.

It therefore remains that construction and engineering projects will continue to be unique undertakings fraught with risk and uncertainty. Each project 'story' develops through its life cycle from the glimmer of an idea or need, to its ultimate demise under the wrecking ball. The story will have elements of human intrigue and relationships, technical challenges, political interference, environmental impacts and numerous sub-plots.

Throughout the project story there will be failures and successes, problems and solutions – all of which should be captured, analysed and recycled for the benefit of future projects. This is the key driver behind this guidance note.

2.2 What does 'project failure' really mean?

2.2.1 Perception vs 'reality'

Success or failure may be in the eyes of the beholder. A project may be considered a failure by not meeting the usual primary objectives of 'on time', 'on budget' and 'to quality' but could well have exceeded all expectations in terms of other less tangible criteria. The converse is also true. 'Technical' success may have been achieved but at what price? This could include damaged relationships and reputation, disputes or unhappy stakeholders.

2.2.2 How is success defined?

Everyone involved in the planning and development of a project from the core team through to the broad range of stakeholders will likely have their own view of what constitutes a successful project outcome. While the 'standard definition' may be the achievement of 'project objectives' this may not be specific enough to satisfy all stakeholders.

2.2.3 Critical success factors

The definition of success frames the context in which decisions are made. If the definition of success is wrong then the decisions that are made will be wrong and could in turn trigger project failure.

As the critical success factors will likely vary between the project team and stakeholders, project managers may find themselves in a conflict situation at the start of the project in attempting to establish what factors will be used to measure success.

The key points for project managers to remember are:

- The traditional 'technical' factors of cost/time/quality can be relatively easy to measure and are in our professional 'comfort zone', but might not be fully representative of all stakeholder interests.
- Even if these factors are met, the project may still be viewed as a failure if its safety and environmental record during construction is poor or if it does not deliver a sustainable asset.
- Although the project manager's involvement often ends at the completion of the project they still need to consider the longer term business benefits that the client/sponsor is seeking from the project.
- Stakeholder engagement (see the RICS guidance note of the same title) and consultation may result in pulling the project in different directions, but this is no excuse for not carrying out full and effective stakeholder consultation.
- 'Project management success' may not equate to 'project success'.

2.3 The perception of 'failure'

There are many examples of project failures or disasters that can be used as examples of 'how not to do it'. IT projects and large engineering infrastructure projects appear to be the most common, but there are also some notable building projects to learn lessons from.

These projects can hit the headlines, create political and financial embarrassment, affect people's lives, jobs, company reputations and reflect poorly on the industries concerned. This in turn creates a negative public perception.

It is most unfortunate that for every well-publicised 'failure' there are thousands of successful, well-planned and delivered projects that do not receive the same positive press. They are just as important to learn from as the 'disasters' and should not be ignored. In fact, *all* projects can provide valuable lessons learned that should be captured, shared and implemented on the next project. Project managers should ensure that a process is put in place to capture this knowledge from every project and build it into their project plan. Practical steps are outlined later in section 5.

3 The causes of project failure

3.1 Common causes of project failure

The most significant causes of project failure that chartered surveyors are likely to be involved with relate to construction and engineering projects.

Some of the causes described below will sound familiar and may spark a reaction (or shudder) in recalling a particular situation. However, it is vital to take on board the knowledge and experience of project failures and problems encountered in the past so future projects benefit from these lessons.

The causes are shown in quotation marks and are organised under the following headings:

- project initiation and planning
- governance
- people, and
- technical.

Project initiation and planning

'If you fail to plan you plan to fail...'

- In an environment where fast tracking projects becomes the norm, less time is spent on planning projects and more time is perceived to be spent on trying to resolve issues that could have been prevented if adequate planning was carried out in the first place.

'Lack of clear project management/methodology...'

- Failure on the client's part to recognise the importance/value of project management
- Failure to appoint the project manager early in the process.
- Project managers must adopt a clear methodology from the start.

See also the RICS guidance note *Appointing a project manager*, 1st edition.

'Failure to understand project complexity and the effect on the probability of success or failure...'

- Projects are complex undertakings as most project managers will agree, so the project's 'complexity' needs to be considered at the outset so the true nature of the project is understood.
- Ensure that all stakeholders have the same understanding and appreciation of the complexity of the project.

Section 5 examines current thinking in this area and introduces the simple complexity model.

'Lack of clear business objectives...'

- Failure on the client's part to consider or clearly articulate how the proposed project links with the organisation's business activities/aspirations.
- Failure on the project manger's part to establish the client's business objectives or help the client with identifying objectives.
- Failure by the project manager to articulate the client's business objectives to the rest of the project team and for them to understand the reasons for undertaking the project.
- Failure of the design to fully reflect the client's 'true' business requirements, which follows from poor briefing.

'Poor briefing or changes to the brief...'

- The brief fails to define a clear framework for the project.
- The brief fails to reflect the client's objectives and priorities.
- The brief fails to use a common language to ensure clarity of understanding.
- Failure to identify the method of determining the success of the project.

'Lack of understanding of the project scope...'

- Failure of contractors to understand the complexity of project delivery when tendering.
- Failure of clients to fully articulate their specific requirements and communicate their own knowledge to facilitate tendering, project planning and delivery.
- Failure of clients, project teams and contractors to allow time and resources to reflect the scope and nature of the project.
- Failure to 'get real' at the outset resulting in unrealistic and undeliverable targets.

'Lack of whole project life perspective...'

- Concentration on project delivery only and not taking account of the whole life of the project.

Governance

'Lack of ownership...'

- Failure on the part of the client to take ownership of and accountability for the project, appoint an appropriate individual who will take responsibility for decision making and approvals and be identified as the 'champion' for the project.

'Lack of leadership...'

- Failure on the client's side or project team to demonstrate leadership especially when problems arise.

'Procedural issues...'

- Failure to establish a governance structure that clearly identifies lines of authority, communications, stakeholders, roles and responsibilities – with resulting confusion.

'Avoidance...'

- The tendency for project managers to see necessary governance as a restriction to their ability to react in an agile manner to developing scenarios – this can lead to, at best, the delivery of a fait accompli into the governance chain; at worst, secrecy.

People

'Behavioural issues/attitudes...'

- Fear of giving 'bad news'.
- Failure of people to engage with the project and communicate freely and openly.
- Failure due to 'silo' mentality between groups/ organisations.
- Poor attitudes/performance due to under resourced teams.
- Negative attitudes and preference for sniping as opposed to being constructive and helpful.
- Arrogance ('My way is the right way.')

'Breakdown of client and team relationships...'

- Difficult situations not addressed effectively – people 'retreating into their corners'.
- Unrealistic demands or 'impossible' targets by clients.
- 'Bullying' by client organisations (reduce fees/demand more).
- Loss of trust and respect between parties.
- Blame culture when mistakes/errors are discovered.
- Failure to address problems early, allowing them to fester.

'Poor communications...'

- Failure to develop, distribute and maintain an effective communications plan.
- Poor communication skills of key project members.

See also the RICS information paper *Managing communications*, 1st edition (2013).

'Personnel changes/lack of continuity throughout project...'

- 'New broom' attitude – damaging existing working relationships by changing what has worked well – for no good reason.
- Too many personnel changes or poor management.

'Lack of real collaboration...'

- Failure to understand the importance of true partnering and collaboration.
- Failure of the client to recognise benefits of collaborative working.

'Poor engagement with stakeholders...'

- Lack of understanding of stakeholder requirements.
- Failure to identify the right stakeholders.
- Failure to properly manage stakeholders.
- Stakeholders are not brought in at the right stage of the project.

See also the RICS guidance note *Stakeholder engagement*, 1st edition (2014).

'Bureaucracy'

- Unnecessary organisational complexity resulting in demotivation of project team.

'Political (large and small 'P')...'

- Unwelcome interference by 'politicians' and others with diverging agendas.

'Wrong person for the job...'

- Inexperienced project sponsor.
- Lack of project management skills.

Technical

'Project planning...'

- Failure to look ahead and plan effectively.
- Unrealistic timeframes.
- Administration failure/inadequate resources to keep track of changes and costs.
- Failure to carry out effective risk/issue identification and management.

'Technical problems/design...'

- Poor brief.
- Incomplete tender documentation.
- Uncoordinated information leading to site conflicts.
- Untested designs/materials.
- Lack of design/scope freeze.
- Chasing the latest technology causing scope revisions during project lifespan.

'Lack of resources...'

- Failure of client to secure adequate client side resources.
- Failure of project team/organisations to secure adequate resources.

'Finance...'

- Inaccurate cost estimates/forecasts.
- Poor cost management.

'Procurement...'

- Failure to use a suitable/appropriate procurement route.

3.2 Human issues

Under the heading of 'people/behaviour' one of the potential reasons for failure is given as 'failure due to fear of giving bad news' – i.e., people involved in a project who see problems or potential problems, but do not speak up thus allowing the situation to continue unchecked.

This tendency is being addressed in the safety arena with profile being given to the recognition of potential hazards. However, the relationship between the project manager and client can be problematic. Potentially bad commercial news is frequently held back until it can be fully evidenced, by which stage it is often too late to do anything about it.

Also, the fear of consultants to say 'no' can lead to unrealistic expectations from clients. This makes it very difficult for project teams to deliver, resulting in unsuccessful projects.

This 'human' factor in relation to project failure or success received overdue attention in 2006 with a ground breaking study *Silence fails* conducted in the USA by VitalSmarts and The Concours Group.

The study collected data from more than 1,000 executives and project management professionals across 40 companies including pharmaceuticals, airlines, financial services, government agencies, and consumer products. While most of the 40 were Fortune 500 multinational organisations, about 10 per cent were smaller, regional firms. Some organisations had sophisticated project governance, management processes, and policies, while others had far less developed approaches. The analysis encompassed more than 2,200 projects ranging from $10,000 IT projects to billion-dollar organisational restructuring efforts.

Although the study was researched in the USA its findings have universal relevance. For example, this is similarly the case in the Chinese construction industry with a prevailing culture of *'report to the boss only good news rather than the bad'.*

One very persistent theme of the study findings is the incidence of the unwillingness or inability to speak up effectively and confront issues before they escalate and endanger project success. It is not proposed to repeat the detailed results of the study in this guidance note, but readers may find it useful to review the report in full.

According to the study many of the organisations that have implemented formal project systems still experience significant project failures. The authors suggest these systems are not enough for effective project delivery and identified five key areas that may predict and explain failure, including:

- unrealistic deadlines or insufficient resources
- lack of leadership, clout, time investment or energy from stakeholders to see a project through to completion
- project leaders and teams working around priority setting processes
- the failure of leaders and team members to admit a project has issues or significant problems in the hope that someone else will speak up
- a lack of support or inability to support a project by teams within the project.

Cultivating 'a culture of open dialogue' was identified as a method for addressing these issues, with the report giving five key methods that project leaders need to facilitate:

- make problems visible
- measure the behaviours of team members
- upskill team members to handle political or sensitive issues and lead discussion
- enable organisations to hold senior management accountable
- send a clear and public message that these conversations are crucial and people who raise these issues are highly valued.

The following quote from the *Silence fails* report is particularly important to note:

> 'Breaking the code of silence on five astoundingly common yet largely undiscussed and ignored problems will contribute significantly to project success. Unless and until leaders take measures to ensure the environment is conducive to holding crucial conversations a significant number of these issues will remain unaddressed, invisible and fatal.'

3.3 When projects fail before they start

Many of the causes of project failure suggest that these factors would have been evident at the inception of a project.

Indeed, as noted earlier, there are many examples and analyses of project failure available to learn from and use in the planning and preparation of a new project. But do make good use of this information and apply the lessons. Section 4 considers this issue and examines the reasons why in some cases people do not appear to learn from previous projects.

Fundamentally, most of the reasons for failure can be summarised by poor communications and this is why it is so important for clients and their project managers to be able to articulate clearly at all stages of the project life cycle (see also the RICS guidance note *Stakeholder engagement*, 1st edition).

4 Why are project lessons not learned?

4.1 Overview

As stated at the beginning, this guidance note aims to raise the awareness and understanding of the factors that contribute to project failure throughout the project life cycle and the importance of learning lessons to avoid repeating them in the future.

The process of how knowledge is captured and learned from requires time and resources, and the commitment (individual and/or organisational) to carry this out. This section looks at the barriers and constraints faced by individuals and organisations in implementing what is generally regarded as 'good practice' but, in reality, is not always put in place.

There are two parts to this issue. The first concerns the process of capturing knowledge from a project, what worked and what did not, for the benefit of the next project or future projects we are likely to work on. The second issue relates to the access and use of such knowledge.

There is no shortage of good practice guidance available to help the project manager in developing and implementing an effective process for capturing knowledge to suit the particular project circumstances. References for further reading are given in the bibliography, while section 5 looks at practical solutions for capturing project knowledge and applying the lessons learned.

4.2 Capturing knowledge

It is important to first consider the issue of capturing project knowledge and the issues many already face in the 'real world' of project management.

Many organisations have built into their project delivery planning formal procedures for capturing knowledge and lessons learned that normally comprise regular project reviews and feedback from a workshop at the end. However, it is likely that such processes are not implemented on smaller projects and with 'occasional' clients where the perception may be that there is no value in the process.

Further, the success of such processes depends heavily on the individual contribution and willingness to raise and openly discuss issues encountered on the project.

4.2.1 The individual

From an individual's perspective, taking time to learn lessons from a project may be met with a certain level of resistance. This commonly encountered mentality may be due to some of the following underlying assumptions:

- Learning lessons is a waste of time when there are other projects to work on.
- Admitting to a mistake could cause the individual to be fired, sued (or their company) and lose out on future projects.

Additionally, some may adopt the following defensive strategies to avoid blame:

- If asked about 'the problem' it is easier to blame someone else or remain silent.
- Meeting the client is more about impressing them than dwelling on problems and can be a great exercise in self-promotion.

Clearly before any lessons are learned they have to be captured, but in so doing the realities of human behaviour and our reluctance or unwillingness to speak and debate potentially difficult issues need to be accepted. Practical solutions are considered in section 5.

4.2.2 The organisation

From an organisational perspective there are many other barriers that may prevent the processes taking place or being effective:

- **Culture** – the organisation's culture does not support a learning environment.
- **Resources** – learning does not receive funding or support (including the time to participate in reviews/ workshops).
- **Fear or resistance to change** – the organisation does not encourage new ideas/new ways of working.
- **Lack of openness** – the organisation does not encourage open discussion and debate.
- **Short termism** – the organisation focusses only on the short term and is unwilling or interested in long term issues that lessons learned may benefit.
- **Avoidance** – a culture of management to 'avoid' problems and not accept responsibility.
- **'Blame culture'** – 'It's somebody else's fault.'

An interesting perspective on the role of the organisation comes from von Zedtwitz (2002) in his article *'Organisational Learning through post –project reviews in R&D'.* Zedtwitz opens with the statement that 'post–project reviews are one opportunity to improve performance on subsequent projects. However, a survey reveals that only one out of five R&D projects receives a post-project review.' He continues that even when these do take place they 'are typically constrained by lack of time and attention as well as lack of personal interest and ability.'

Although this paper relates to research and development projects in major IT and manufacturing sectors, the issues raised, in particular the impediments to post project

reviews, are relevant to any project. Zedtwitz (2002) then sets out four areas that he argues create barriers to learning from post-project reviews. These consist of:

- **psychological barriers** (e.g. a reluctance to reflect on our actions in a critical manner)
- **team-based shortcomings** (e.g. a reluctance to 'blame' team members or managers)
- **epistemological barriers** (relating to the theory of knowledge, e.g. an inability 'to see the wood for the trees'); and
- **managerial constraints** (e.g. a lack of time to address issues in a business that typically looks three to five years ahead).

Remember that the purpose of a lessons learned process is to elicit information and build knowledge on both what went well and what could have been done better. It should be seen as a wholly 'positive' process, not 'negative' in the sense of labouring what went wrong and who is to blame.

4.2.3 A broader view of lessons learned

It has been argued that it is common to take a narrow view of lessons learned and that the process is more than just an administrative one.

Jugdev (2012), writing in the *American Journal of Economics and Business Administration*, refers specifically and critically to the *PMI Body of Knowledge Guide* which she contends:

> '…defines lessons learned narrowly, primarily as a set of administrative, documented outputs pertaining mainly to the closeout phase…defined more broadly, lessons learned are the learning (in its various forms), that take place throughout a project and between projects.'

Taking Jugdev's point, lessons learned should not just be a documented workshop at the end of a project but instead seen as a process of sharing both tacit and explicit knowledge, and creating an ongoing culture of informal project knowledge sharing. Projects should not be closed out until a properly documented lessons learned session is held with all relevant stakeholders and then communicated to all.

4.3 Using knowledge

4.3.1 'File and forget?'

Having successfully carried out a team workshop at the end of the project, what then happens to this information? If it is immediately consigned to the filing cabinet or data storage device never to emerge then the whole workshop effort could be considered a waste of time and resources.

Another perspective on this issue comes from research carried out by Pfeffer and Sutton (1999) in their book *The Knowing – Doing Gap*. The authors consider the problem of turning knowledge into actions; they say 'One of the main barriers to turning knowledge into action is the tendency to equate talking about something with actually doing something about it.'

In the context of this guidance note this can be interpreted as carrying out project reviews and lessons learned workshops, then simply filing away this knowledge with the satisfaction of having successfully carried out the process – but doing nothing with that acquired knowledge.

The same can be applied to the process of developing mission statements for projects. Many of us have experienced agreeing as a team the project aims and objectives and produced posters for team members' offices to remind us of our agreement – but as Pfeffer and Sutton (1999) observe 'The problem is that there are too many organisations *[read projects?]* where having a mission statement is confused with implementing those values.'

The authors consider issues of talking as a substitute for action, fear preventing acting on knowledge, measurement obstructing good judgment and issues of internal competition. Most of the case studies relate to major business organisations, but parallels can be drawn with the planning and management of projects in the built environment. This final quote from the authors gives a sense of one of the key differentiators of success:

> 'Organisations that are better at learning and translating knowledge into action understand the virtue of simple language, simple structures, simple concepts and the power of common sense, which is remarkably uncommon in its application.'

5 Practical solutions

5.1 Overview

So far this guidance note has looked at the causes of project failure, considered how to determine if a project has 'failed' or 'succeeded' and examined the issues around the process of learning from projects from individual and organisational perspectives.

This final section provides project managers with some practical ideas for implementing processes to capture, share and use valuable knowledge and experience to benefit ongoing and future projects.

The justification for capturing and reusing project knowledge can be demonstrated through its fundamental benefits, including:

- accumulation of 'soft assets' for the organisation
- help with intra-organisational training with 'living knowledge archive'
- not repeating the same mistakes
- improvements in project planning and delivery
- improving project outcomes
- reduction in risks
- not wasting money and maximising the benefits of the investment
- improved client/stakeholder satisfaction
- improved reputation (individuals/organisation/industry)
- development of project management competencies
- increased expertise and professionalism.

It must be remembered that all projects, large and small, can benefit from the process of capturing and re-using project knowledge and lessons learned.

In this regard first consider the 'typical' scenarios that are likely to be encountered on a day-to-day basis:

- **One-off projects** – perhaps the most common situation – knowledge can be captured and re-used by the client and individual team members on their next projects.
- **Phased projects** – knowledge and lessons learned captured during and at the completion of each phase to inform successive phases.
- **Framework agreements** – similarly, knowledge and lessons learned captured during and at the completion of each project to inform successive projects.

In each case there is a compelling argument for implementing a process for capturing and reusing valuable knowledge and experience.

5.2 Capturing project knowledge before it is lost

The process for capturing project knowledge has generally been focussed at the end of a project via a meeting or workshop with the project team members. While this can be reasonably effective it has certain disadvantages:

- Knowledge and experiences during the project may be lost due to staff changes or simply forgotten about.
- Team members may not be available to participate due to the demands of the next project.
- Project 'fatigue' and breakdown in relationships at the end of a project may prevent open discussion.

A more effective approach is to make it a continuous process throughout project life cycle and implement the live capture of reusable project knowledge. Knowledge management should also be on-going and organisations should have nominated individuals to champion the implementation and management of the process.

The 2010 book *Capture and reuse of project knowledge in construction* makes a strong argument for this approach. It describes a methodology designed to:

- Facilitate and encourage project team members to share important knowledge.
- Store lessons learned in a format that aids sharing and understanding of the content.
- Enable the capture and reuse of knowledge in real time (i.e. 'live') or as soon as possible afterwards to address knowledge loss due to the time that elapses in capturing it.

The first point is really about establishing an ethos or culture of openness within the project team and is very much an issue of 'leadership', from both the client and importantly the project manager.

The second point relates to the technical aspect of recording, storing and retrieving information on which point the authors include a section on computer systems. While this may be of interest to those involved on larger more complex projects, this guidance recommends keeping the process simple and accessible as the primary goal.

The authors refer to the process of evaluation at project completion, but also to the concept of a project knowledge file (PKF) for containing relevant project information that can be used during and after the completion of the project.

The PKF includes:

- Background information on the project including dates when knowledge was captured.

- Abstract – short description of the knowledge captured.
- Details – detailed explanation to help understand and re-use knowledge (using various media).
- Conditions of re-use – describes the conditions for reusing the particular knowledge entry.
- References – other relevant knowledge (web pages, books, reports, etc.).

The phrase 'various media' above highlights that with the technology now at our disposal it is possible to be less linear and think of capturing information not just in conventional documents but in various formats. This approach may not be possible or practical on all projects, but the point is well made in terms of the different ways in which we now gather information, e.g. the use of social media. Project managers should consider how different people and groups like to receive information and how this idea could work when developing a project communications strategy.

5.3 Other sources of project knowledge

This guidance has concentrated on learning from projects and developing a store of knowledge from your own experience, but learning from others' experience is just as valuable. Initiatives such as 'lunch and learn' can provide a very effective communication and knowledge transfer opportunity in an informal environment that should encourage free and open dialogue, and exchange of experiences and ideas.

Having an online portal that sits within an organisation's intranet can also be a useful tool where knowledge already captured and stored through project evaluations can be shared.

Formal project reviews can also prove to be invaluable resources – such as the Auditor General of Scotland's report on the Holyrood project which contains valuable lessons learned applicable to many projects. Another good example is the National Audit Office report on the BBC's management of three major estate projects. Once again these are major capital schemes but the lessons are more broadly relevant.

Project managers are encouraged to collect and share knowledge and information from their own projects but also to make themselves aware of other projects worldwide and reports and analyses that can provide useful reference for use on their projects. The bottom line here is that project managers should continue to learn and develop their skillsets throughout their careers and to look outside of their immediate areas of expertise for new ideas.

5.4 Applying the lessons

This final part looks at the practical re-use of knowledge, experience and lessons learned through the project life cycle.

5.4.1 Project inception

As alluded to earlier, many projects that fail are in trouble before they start. It therefore follows that potentially the most critical time for any project is its inception and it is at this point where the knowledge, experience and lessons learned from the client and advisors can be most beneficial to project success.

5.4.2 Reality check

The key points to consider include the following:

- Do the reality check before design work gets underway and spending on design fees.
- Does the outline business case stack up?
- Use well-respected independent 'experts' with relevant knowledge and experience.
- Examine and challenge the brief – do not assume that the client's own brief is realistic and achievable.
- Establish and agree the broad cost/time/quality triangle balance the client wants.
- 'Leading edge', 'world class', 'award winning' – clients like these phrases, but what do they mean and are they achievable?
- Is the customer really always right?
- Can the client perform or accomplished any similar projects in the past?
- Is there an expectation of political influence or interference?
- The process may stop a project before it starts or a disaster before it hits.

Remember that contending with some negatives from the client is to be expected, so be prepared to respond to the following either implicitly or explicitly held attitudes:

- 'We haven't the budget for the fees to run your reality check.'
- 'We didn't do it on the last project and there were no problems!'
- 'You are the expert – you know what I want – just tell me when it's finished.'
- 'The client knows best!'
- 'Reluctance to present or accept bad news!'
- 'We haven't time for all this – we need to get moving!'

5.4.3 Project Execution Plan (PEP)

The preparation and circulation of a robust project execution (or management) plan should be on the project manager's initial task list at the start of a new project. Within the PEP the project manager should establish the process for capturing knowledge and lessons learned including:

- the process for regular/stage reviews and documenting results
- the process for close out review and documenting results
- access to information – where is it stored/how it can be accessed.

A table of contents demonstrating the kind of section headings you might expect to find in a PEP is included in Appendix B on page 23.

5.4.4 Complexity modelling

As outlined earlier, a lack of understanding of the complexity of a project is a possible factor contributing to project failure.

One way of demonstrating, communicating and gaining full understanding of the complexity of a proposed project is to create a framework or 'model' of the main elements that contribute to its complexity. The use of a complexity model should help to facilitate conversations, especially in the initial stages, to ensure a common understanding based around the same structure and language.

A simple model is described by Shenhar and Dvir (2007) in *Reinventing project management*, based on a so-called 'diamond' model:

> '…designed to provide a disciplined tool for analysing the expected benefits and risks of a project and developing a set of rules and behaviours for each project type. If you visit each base during project planning in a methodical way, you will be able to consider the uniqueness of your project on each dimension and select the right managerial style for this uniqueness. The diamond analysis is also helpful in assessing a project in midcourse, identifying possible gaps in a troubled project and selecting corrective actions to put the project back on track.'

The points of the 'diamond' are represented by:

- **Novelty** – the uncertainty of the project's goal.
- **Technology** – the level of technological uncertainty.
- **Complexity** –the complexity of the product, the task and the project's organisation.
- **Pace** – the level of urgency driving the project.

As Shenhar and Dvir (2007) note in their introduction, the four points underlying this 'diamond approach' are intended to provide 'a new framework and a common language to talk about project management.' The authors continue that by using these tools 'you will be able to present your case in a simple, smart way and ask the right questions before committing to a project or programme.'

This is an innovative way for the project manager to present a risk profile for a project and stimulate discussion at a very early and critical stage in a project's development.

5.4.5 Risk management

This is one of the areas where lessons learned offer potentially the greatest value in project planning and delivery.

Project managers should refer back to their lessons learned reports and extract issues relevant to the new project. As a starting point for the risk management process to 'seed', the initial brainstorming/risk identification stage will involve:

- identifying the key areas where previous projects went wrong
- identifying where things worked well and could therefore be repeated
- keeping the issues anonymous – use generic descriptions and respect confidentiality
- considering all issues – technical, governance, relationships and 'people' issues.

5.4.6 Project meetings

A very simple and practical approach for the project manager is to introduce a monthly item on the meeting agenda for 'lessons learned', inviting individuals to offer up comments/observations from the previous month. These are then shared with other members of the team and recorded in the minutes.

Introducing this at the start of the project encourages individuals to share experiences from their previous projects that may have current relevance. Also, starting this initiative early in the project life will help to establish the ethos of open dialogue, especially when team members may not have worked together before.

5.4.7 Interim gateway/assurance reviews

Project managers working in and consulting to the public sector will be familiar with the gateway review process. In 2011 the Cabinet Office produced *Major projects approval and assurance guidance* which states:

> 'The aim of the Major Projects Authority (MPA) is to bring about the successful delivery of major projects across central Government by working with departments to ensure the fitness and quality of major projects throughout their life. This will be achieved by introducing revised procedures for the assurance and support of major projects, and ensuring they are integrated with strengthened Treasury approval processes. This guidance outlines these revised procedures and sets out how they will work together within an integrated assurance and approval framework.'

The framework for assurance reviews in this guidance provides an opportunity for ongoing knowledge capture at each review and reflection on the lessons learned during

the previous stage(s), although this is not explicit in the guidance.

While this guidance is aimed at major government projects, the principles of on-going reviews and assurance can be applied to most project undertakings regardless of scale and value. As noted earlier in this guidance note – keep such reviews uncomplicated, positive and avoid apportioning blame. Adopt the principles but keep the process simple and useable.

The MPA is part of the Cabinet Office and publishes useful guidance (including about the gateway review process) and case studies that are valuable skills development material for project managers. While designed for reviewing major projects at their various stages, many of the ideas can be used for all sizes of project and are valuable reading.

5.4.8 Framework agreements

Long-term agreements provide an excellent opportunity for continuous learning and improvement. Project managers should consider holding annual or more frequent 'refresher' workshops to help to refocus the team on project objectives, repair any damaged team relationships and discuss what worked well and what did not over the previous year.

At such workshops it can be that not only lessons learned from the contract are openly debated, but that the contractors also share knowledge and experience of similar projects. They can also be used to evaluate performance against the mission statement to ensure compliance with the original agreement.

5.4.9 Project evaluation at completion

This guidance has outlined the merits of a 'continuous process' for capturing knowledge and lessons learned during the planning and delivery of a project. However, it is likely that in many cases a formal evaluation will be carried out at project completion along the lines of a facilitated workshop.

The disadvantages of this process are:

- Knowledge and experience during the project may be lost due to a change of staff or just forgotten.
- Team members may not be available to participate due to the demands of the next project.
- Project 'fatigue' and breakdown of relationships at the end of a project may prevent open discussions.

Despite these disadvantages an evaluation workshop at project completion can be productive and lead to useful results for the benefit of future projects. Although not exhaustive, the following gives an overview of issues and recommendations relating to facilitating such workshops.

5.4.10 Workshop facilitation

- While any member of the team may be able to plan and facilitate the workshop it could be beneficial to engage an independent facilitator who has no 'baggage' associated with the project.
- Consider using a 'neutral' venue with no distractions.
- Send participants a note in advance describing the purpose of the workshop, the benefits and what is expected from them.
- Ask participants to send back a list of 'issues' they have encountered on the project – say a list of the ten most important issues they feel should be discussed with the team – what went well, and what did not go well, from which lessons can be learned.
- These lists can then be analysed to identify key 'themes' and to help create a framework for the workshop agenda.
- The facilitator should manage the time effectively to ensure that all issues on the agenda are addressed during the workshop.
- The facilitator should 'steer' but not lead the discussions to capture both good and bad lessons and elicit solutions not just complaints.
- The proceedings must be fully recorded and participants should receive a copy of proceedings at the end to review and provide further feedback.

Workshop process

- It is useful to start a project evaluation or lessons learned workshop with some preliminary words to set the scene and to describe what the workshop is about, what it is attempting to achieve and set out some rules.
- This can be done with hand-outs or presentation slides. An example of how this might be approached is shown in the series of six slides given in Figure 1 overleaf.

Figure 1: Indicative slides outlining the workshop review process and its underlying principles

Final notes and recommendations

- Build the evaluation workshops into the project budgets and programme (both interim and final).
- Carry out the final workshop close to project completion.
- Ensure that the key team members attend.
- Consider an independent facilitator (with the caveats below).
- Ensure that the focus of the workshop is on the project, the experience gained, lessons learned and the collecting of good, valuable information for future application and not on just collecting data for its own sake. The choice of and briefing of the facilitator is important to ensure the success and value of the workshop.
- Issue the report promptly and consider standard wording to thank contributors and encourage the use of the knowledge acquired from the workshop.

5.4.10 People

Regardless of all the procedures and the process set out in PEPs or manuals, and in spite of the determination to establish an open culture, in the end it often boils down to people and their willingness to participate.

People need to see the value of capturing and re-using project knowledge and the investment in time that goes with it. This goes from the senior management of an organisation right through to the individual team member. Without this leadership from the top, such initiatives are unlikely to be implemented and the benefits lost.

Team members also have to be comfortable in coming forward with issues for discussion as they arise on their projects and also have the time and a simple process for recording knowledge and lessons learned before it is lost. With regard to 'coming forward' the government's Major Projects Authority addresses this issue in their 2013/14 Annual Report under the heading 'developing an open culture':

> 'Delivering projects of the complexity of those in the Government's Major Projects Portfolio (GMPP) requires a recognition of the challenges involved – because it is through such openness that solutions can be found. This can only happen in an open culture, where those responsible for delivering projects feel able to raise issues as and when they arise. Our transparency agenda, exemplified through the MPA's Annual Report, is a crucial component of this culture of openness.'

Therefore the greatest challenge for project managers and leaders is to create an environment which supports open dialogue, constructive criticism and allows people to communicate their concerns and ideas without fear.

In their report *Lessons learned from the London 2012 Olympic and Paralympic Games construction programme* Davies and Mackenzie (2011) draw some interesting conclusions from their research, in particular the 'people' and learning aspects of the project:

> 'The running of workshops to discuss how the organisations and culture were developing and to seek consensus around issues and solutions – many interviewees credit these for achieving and maintaining a close alignment of the Olympic Development Agency and Delivery Partner over time.'

At the conclusion of their report, the authors describe four key lessons from the 2012 construction programme:

1 Invest in comprehensive project and programme management processes.

2 Find a way to create an intelligent and broad – capability client.

3 Secure full funding (having a realistic programme to work helps to create the right culture from the off).

4 Invest in human resources and organisational development – build skills, relationships and a supportive culture.

These four lessons can be applied to almost any project situation, large or small.

A final practical issue to consider under the 'people' is the reality of personnel changes during the life of a project. Knowledge gained by a departing team member should be captured and used to assist in the handover process, as well as adding to the store of project knowledge and experience.

This is of particular importance when there is a regrettable change in project manager, who should be given an opportunity to record their own lessons learned and ensure that this valuable knowledge and experience is not lost.

5.4.11 Technical and people skills

The technical aspects of capturing, recording and sharing knowledge and lessons learned are relatively straightforward to acquire and implement through:

- meeting records
- formal reviews/workshop records
- information from external sources/reports/studies/ research, etc.

Each project or programme will adopt recording systems as appropriate, but the important issue is to have a system and to use it effectively. Implementation and successful application is down to the people, culture and ethos of the organisations involved as discussed throughout this guidance note.

It is therefore important to stress the significance of training where the 'softer' skills of project management may need bolstering. The term 'soft' skills is used with caution as these perhaps should be regarded as 'tough' skills – often harder to acquire and practice than technical skills.

For those new or already involved with the world of project management, technical 'hard' skills are needed but, without the 'soft' skills, you will fail to deliver successful projects. The art of good communication is the greatest 'soft' skill of all.

There is no shortage of training in this area and thus no excuse for not taking courses, attending CPD events and using online resources. For recently qualified surveyors organisations should consider mentoring and shadowing opportunities to watch and learn from others and also explore the potential for secondments with other organisations.

6 Summary

This guidance note has linked two highly significant aspects of the planning and delivery of projects. Firstly, it has addressed the issue of failure or success and how this is perceived and defined; secondly, it has addressed the value and importance of the knowledge acquired during the project life cycle and its role in informing future projects to reduce their risk of failure.

The guidance has also analysed project failure and success and a key point for surveyors to note is to resist judging 'failure' or 'success' in terms of 'technical' performance alone. They also need to consider the non-technical impacts of the project. Another important point is the need to ensure at the project outset that the clients' critical success factors are fully understood and articulated to all members of the project team and key stakeholders. This underscores the need for a comprehensive project brief.

There is much evidence of the causes of project failure, the most significant of which are set out in this guidance (*see* 3.1 Common causes of project failure). It is suggested that surveyors consider using these issues as a check list at the start of every project. Of particular importance here are the many 'people/human' issues that can contribute to potential failure, especially the issue of people speaking up when they believe a project is going wrong.

Section 4 looked at the importance of capturing knowledge and learning lessons from projects. In particular it focussed on the potential difficulties faced by individuals and organisations in capturing project knowledge, and the possible unwillingness to take a critical view of a project at its completion before moving on to the next.

Finally, in section 5 the guidance looked at practical solutions. It examined how surveyors can implement simple but effective processes to capture and apply acquired knowledge and lessons learned for the benefit of future projects.

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Further reading

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Directing change: a guide to governance of project management, APM, 2011.

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Appendix A: Case examples

It is not proposed to carry out any form of detailed analysis of the projects listed below, but rather to highlight the key issues and lessons learned.

Case example 1: Saudi construction project

A success in the guise of a failure: a light rail project undertaken by a major Chinese contractor in Saudi Arabia suffered a serious cost overrun. The real cost was significantly above the contract price. As a result, the project was at first seen as a heavy financial loss for the contractor; however, the project finished on time, to quality and to the satisfaction of the project employer (as the overrun cost was borne by the contractor the project had indeed been a success in the eyes of the employer!).

However, due to the reputation built from this project, the contractor was awarded other contracts in Saudi Arabia over the following years. The contract amount contributes notably to the rapid market share growth of this contractor and stock appreciation. Ultimately, the project is seen as a great facilitator by the Chinese contractor to successfully gaining a 'good footing' in the Saudi construction market, rather than being viewed as a 'failure'.

Case example 2: Australian concert hall

This was an ambitious project to plan and construct a modern public building to house a concert hall. The initial estimated cost in the late 1950s was $A7m over a six year programme. The final cost in the mid-70s, however, was over $A100m and the project actually took 16 years to plan and build. While the building is now regarded as a great architectural triumph, the project has been criticised and regarded as a planning disaster, suffering from inadequate cost estimates, problems with engineering design and inadequate technical control. Specific issues that contributed to the problems included:

- The government was committed to a 'prestige' project for political reasons.
- The project would never have been built if the facts of the costs and programme had been known at the start. The clients and public were completely misled by the first estimate.
- There was a complete lack of knowledge of user requirements.

The key lessons learned included:

- Better planning required at the start.
- There should be complete designs before work starts.
- The need for improved project management.

Case example 3: New parliament building in the UK

This project involved the design and construction of a major new parliament building. The initial estimated project cost was in 1998 was £90m and the final outturn cost in 2004 was £431m.

The key issues were identified in a subsequent government report as:

- **programme slippage** – detailed design variations, the late supply of information and unrealistic deadlines.
- **cost increases** – design development added £80m; costing design rather than designing to cost; restricted tender competition.

The report also identified and articulated the following key lessons learned:

- **Project management and control** – unclear 'balance' between time, cost and quality at the start; leadership not clearly established; responsibility and accountability not properly allocated; cost plan not fully agreed, and the clear need for better cost reporting and financial control.
- **Risk management** – accounting for risk inadequate; no quantified allowance for major risks; little evidence of forceful action to prevent or reduce cost increases.
- **Professional fees** – costs not controlled.
- **Procurement strategy** – insufficient experience of construction management.

Case example 4: Engineering/infrastructure project – new highway

A major new toll road project that connects two cities in western Canada resulted in significant cost overrun. This led to an in-depth independent review to learn lessons and avoid repeating the same mistakes in future major public projects. The initial estimate for the project was $750m, with the final costs totalling $998m. The independent review identified the key issues as:

- Legislature mislead by documents presented to it.
- True costs not represented in a forthright way – 'manipulated'.
- Fast track schedule – design not adequate – work not adequately specified.
- No accurate and timely cost reporting.
- Inaccurate estimates.
- No effort to monitor or report costs.
- Lack of control over major changes in scope.

A number of key recommendations were made for future major projects including:

- Realistic assessments of costs and uncertainty of major capital schemes.
- Initial approval for schemes limited until project details developed.
- Approval process requires full details of scope, costs, schedule – evidence of proper planning.
- Adoption of Project Management (PM) practices – Single PM/Full time support/documented delegation/ project control group.
- Review of contract document – ensure fair risk sharing.
- Review of estimating procedures.
- Comprehensive cost reporting management system.

Case example 5: Non-construction project – government IT/information system

A government department initiated a major management information system project. It was intended to support a new way of working, providing one integrated system and improving operational efficiency within the department. A subsequent report by the National Audit office identified problems encountered in the planning and delivery of the project.

Key project facts:

- 2005 – Approved lifetime costs to 2020 are £230m.
- 2007 – Expenditure at £150m – two years behind schedule – estimated costs £690m.
- 2008 – Project re-scoped – estimated lifetime costs £510m (attained).

Key findings by the National Audit Office – the reasons for delay and cost increases:

- There was inadequate oversight by senior management.
- The department did not put the appropriate resources and structures in place to deliver such a complex project and underestimated this complexity more generally.
- Programme management was poor in key aspects, including planning, financial monitoring and change control.
- The department underestimated the need to invest in business change alongside the IT system.
- The department's contractual arrangements with its key suppliers were weak and its supplier management poor.

Appendix B: Project execution plan (PEP)

The following is an indicative table of contents, giving an outline of the section headings you might expect to find in a PEP.

Confidence through professional standards

RICS promotes and enforces the highest professional qualifications and standards in the development and management of land, real estate, construction and infrastructure. Our name promises the consistent delivery of standards – bringing confidence to the markets we serve.

We accredit 118,000 professionals and any individual or firm registered with RICS is subject to our quality assurance. Their expertise covers property, asset valuation and real estate management; the costing and leadership of construction projects; the development of infrastructure; and the management of natural resources, such as mining, farms and woodland. From environmental assessments and building controls to negotiating land rights in an emerging economy; if our members are involved the same professional standards and ethics apply.

We believe that standards underpin effective markets. With up to seventy per cent of the world's wealth bound up in land and real estate, our sector is vital to economic development, helping to support stable, sustainable investment and growth around the globe.

With offices covering the major political and financial centres of the world, our market presence means we are ideally placed to influence policy and embed professional standards. We work at a cross-governmental level, delivering international standards that will support a safe and vibrant marketplace in land, real estate, construction and infrastructure, for the benefit of all.

We are proud of our reputation and we guard it fiercely, so clients who work with an RICS professional can have confidence in the quality and ethics of the services they receive.

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