Sharing construction cost data – benefits, challenges and opportunities
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Executive summary

In November 2017, RICS hosted three round tables with the objective of identifying the incentives for and barriers to sharing cost data. The first was attended by clients, the second by consultants, and the third by contractors.

There is increasing difficulty in collecting consistent data at the required level of granularity, probably stemming from three causes:

- a decline in the use of bills of quantities (BoQs), resulting from increased use of Target and Design and Build contracts
- a growing reluctance from the industry to give away what is increasingly seen as a valuable commodity, often protected by intellectual property rights (IPR) and
- clients’ insistence on confidentiality, particularly in the private sector.

There was general agreement that the International Construction Measurement Standards (ICMS) could act as a catalyst to changing attitudes.

This insight paper tabulates the challenges and opportunities, and identifies seven key issues for further debate, including:

- How can clients and their supply chains be incentivised to collect data that is comprehensive, and robust, and for which the context is properly described?
- Should RICS take the lead in setting up, managing, quality assuring and analysing a data repository? If so, how should it be funded?
- Is there a need for research into the challenges in understanding the ways in which data is used, and how it might be future-proofed?
1.0 Introduction

The Economist has called data the fourth factor of production. In general, those in possession of data are both privileged and powerful, but ethically, this creates an obligation to use that data responsibly and consider the public good. Whether this happens or not is open to debate, since commercial issues and competitive forces often override all other considerations.

The situation in construction is theoretically no different, except that professional people are bound by a code of ethics and an obligation to serve their clients faithfully. At present, there is evidence, at least in the UK, that construction cost data is collected neither as frequently, as rigorously, nor at the same level of detail as it once was. There are many potential reasons for this:

• changes in procurement practice causing, for example, a reduction in the use of standard methods of measurement
• an increase in the prevalence of subcontracting so that if data is collected, it may be owned by members of the supply chain many times removed from the client or Tier 1 contractor
• the sheer difficulty and costs involved in collecting data at a sufficient level of granularity
• a lack of a widely accepted standard cost breakdown structure to ensure consistency of presentation so that like can truly be compared with like and
• a failure to realise the benefits that the right sort of data analysed in the right way can bring.

Yet benefits there certainly are.

For the future, the relentless march of building information modelling (BIM), artificial intelligence (AI), information technology (IT) and data analytics may make cost data both more readily accessible and potentially more readily useable. It is therefore inevitable that data will play an increasing part in professional roles. However, this raises many questions, both ethical and practical.

• What are the benefits of data sharing and to whom?
• How can we ensure that data is collected rigorously and used responsibly, so that we can be assured for example that benchmarks are robust and consistent?
• Will professional responsibility to the client outweigh the commercial benefits of keeping data private?
• What role should the professional institutions play?
• To what extent can technology facilitate data collection and analysis?
• Who will pay for data collection and analysis and who will own the data and the information it yields?

But the issues are not just confined to capital costs. As whole life performance becomes increasingly important, the situation is exacerbated, not only by the increased difficulty in collecting data consistently and robustly, but by diverse ownership and division in methods of, and responsibility for its collection between designers, contractors, their subcontractors and facilities managers.

Although the inconsistencies in the way that cost, resource, and schedule information is modelled and expressed are fully recognised, this paper focuses on cost data in the first instance since that is what is of immediate and greatest value to clients.

The three round tables hosted by RICS to throw light on these issues, and to encourage debate among professionals, were framed around the following questions:

1. What is the current state of cost data collection in the industry; is it satisfactory to clients, consultants and contractors?
2. What are the benefits of collecting and collating costs in a consistent and transparent way, and providing access to the data to clients, contractors and cost professionals while respecting commercial sensitivities?
3. In the light of the challenges above, what are the barriers?
4. How might the barriers be overcome?
5. Is the industry in general willing to accept, and are clients willing to demand, greater transparency in the way that prices are estimated and presented by contractors?
6. What innovative ways may be available to facilitate the greater collection of cost data for the benefit of the industry as a whole?

This paper reports the outcomes of those debates and synthesises the findings to create a platform for a wider debate within the industry.

Further reading

In November 2017, RICS launched an insight paper, Global Trends in Data Capture and Management in Real Estate and Construction, which pulled together findings gained from members of the Global Alliance for Buildings and Construction (ABC).

Readers of this paper may find it useful to refer to the publication (available at rics.org/insights) which mirrors a number of the challenges and barriers discussed in this document.
2.0 Current state of the art

There is evidence to suggest that stakeholders in the construction industry are finding it increasingly hard to access detailed pricing data.

As an example, the Building Cost Information Service (BCIS) of RICS has reported that, although data submission rates remain as high as ever, the proportion of data is much more biased towards project and elemental analysis data. To compensate for the shift in data availability, the BCIS product teams are actively trialling new methodologies and data technologies, such as AI in the calculation of price indices and location factors that historically have been reliant upon detailed price data sources. This is partly because of a decline in the use of BoQs resulting from increased use of Target and Design and Build contracts, and partly from a growing reluctance from the industry to give away what is increasingly seen as a valuable commodity, often protected by IPR, and clients’ insistence on confidentiality, particularly in the private sector. Even contractors’ estimators may be loath to share their data internally for fear of leaking confidential information to their competitors. While the problem is serious in the building industry, it is even more acute for infrastructure, where historically there has been little success in collecting data from different organisations on a consistent basis, and where repair and maintenance accounts for a significant proportion of expenditure. More recently, through initiatives such as Project 13 (https://project13.com/) and i3P (www.i3p.org.uk/), major infrastructure clients and some members of their supply chains have committed to collaboration, which may well be a first step towards data sharing.

There is a need to define carefully what is meant by cost: a contractor’s cost is a client’s price; a subcontractor’s cost is a contractor’s price. In addition, cost data has little value unless the context (access, potential and actual disruption, logistics, methodology, procurement route, constraints, degree of political influence) in which it was generated is comprehensively and precisely reported and understood.

Although for buildings, most clients request data in the same format, for infrastructure projects many clients collect and analyse cost data using their own cost breakdown structure, vocabulary and taxonomy. Since each one is different, data sharing, while seen as desirable, is difficult. For example, Highways England have developed an elemental costing system and feed actual costs through principal quantities, and the Department for Transport (DfT) is creating its own framework for benchmarking. However, there was a concern, particularly in regulated sectors, that the data could be used as a stick with which to beat operators, especially if the contextual causes of differences in costs were not clearly expressed.

Consultants are also experiencing difficulties in accessing detailed cost data, which nowadays resides largely in the supply chain. Some Tier 1 contractors have also developed their own data collection systems, but there is a reluctance to conform to a standardised approach even within organisations, much less across different organisations. On the other hand, making comparisons across different data formats is becoming easier in the light of advancing IT, and BIM may have a transformative impact on data availability.

In the building industry, where as much as 90% of the work may be subcontracted, Tier 1 contractors are increasingly occupying the space once occupied by private quantity surveyors (PQSs). They may, for example, issue BoQs to their supply chain, but most subcontractors are still using the Standard Method of Measurement, 7th edition (SMM7), which fails to describe the context to which the data relates.

Since there is no widely accepted framework for collecting useful and consistent cost data either for buildings or infrastructure, the recent launch by RICS of ICMS is generally seen as a useful and timely step in the right direction. Nevertheless, the value of the standards depends very much on the willingness of those who own the data both to present it in the specified form and to share it.
3.0 Potential benefits

The benefits of sharing useful, robust and consistent data are widely recognised, both to provide benchmarks, and to improve the quality of estimating and cost prediction. Data sharing would be invaluable to governments, who, like other organisations need to demonstrate value for money. It would allow the efficiencies of different organisations to be compared, inefficiencies to be identified and targeted, and through international comparison, it would provide the opportunity to determine how things were done differently (and potentially better) elsewhere. It would allow clients and consultants, particularly smaller ones, to better determine what a project should cost, what it will cost, and what it did cost.

Contractors felt that clients in major industries with well-defined boundaries such as Network Rail would find it useful to have a standard approach to collecting site data. However, in general they saw fewer benefits to themselves from data sharing than clients and consultants, although as early stage dialogue between clients and contractors becomes increasingly commonplace, they can see the benefits of benchmarks to inform the discussion. They can also see a role for benchmark data at tender settling meetings in helping to ensure that commercial decisions are well-founded and evidence based.
## 4.0 Summary of key challenges and opportunities

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Potential solutions</th>
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<tbody>
<tr>
<td>Data owners are precious about their data. Some clients, particularly those in the private sector, forbid their consultants to share their data.</td>
<td>Provide a trusted central repository which is responsible for ensuring that the data is robust and comprehensive, and the context in which it was collected is precisely articulated. Persuade government of the benefits of data sharing.</td>
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<tr>
<td>The benefits of sharing data are widely recognised, particularly among clients and consultants. Contractors and their supply chains want to know ‘what’s in it for me?’ How can the whole supply chain be incentivised to collect and share cost data?</td>
<td>As the major client, government should take the lead in demanding data from its supply chain; encouraging other clients to do the same by quantifying the benefits. Clients should carefully describe the data they require in the contract specification, and make it a condition of contract that contractors and their supply chains should deliver the specified data. Perhaps clients could be persuaded to pay for the collection and analysis of data that is of value to them.</td>
</tr>
<tr>
<td>For infrastructure projects, there is no common, widely accepted framework for collecting robust, useful, and consistent cost data.</td>
<td>RICS should promote the adoption of ICMS both as UK and international standards.</td>
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<td>We need to define what is meant by cost. Cost to whom? Cost to the client (price), cost to the Tier 1 contractor (also price) or cost to the subcontractor?</td>
<td>RICS should take the lead in carefully defining costs and incorporating the definition in ICMS.</td>
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<td>Data on its own has little value unless the context in which it was collected is also available, e.g. differences in logistics, in the degree of disruption, etc.</td>
<td>ICMS already requires compilers to specify those attributes and values of a project which might have a significant impact on cost. The attributes should be continuously inspected in the light of experience to ensure that the context of the project is comprehensively captured.</td>
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<tr>
<td>Compilers of, contributors to, and users of a shared database may not be sufficiently well trained in the production and analysis of robust data to ensure that it is used in the right way.</td>
<td>RICS should develop a global professional statement and develop and deliver suitable training courses. The lessons learned from Highways England’s model of early contractor engagement and cost reporting should be widely disseminated.</td>
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<td>Where will the data reside, who will control its quality, and who will have access to it?</td>
<td>RICS, through its Building Cost Information Service, should develop a suitable data platform in which the data could be deposited. They should take responsibility for its cleansing and analysis. It will be necessary to develop a suitable commercial model that ensures the sustainability of the repository without jeopardising the willingness of data owners to share their data. The McKinsey model of a data portal developed for the North Sea oil industry might be used as an exemplar; in this model, anonymity of data is preserved and commercial sensitivities respected by allowing donors to see only their own data and its position on the spectrum of the data provided by the whole population of contributor organisations. (<a href="http://www.mckinseyenergyinsights.com/services/performance-improvement/benchmarking-diagnostics/global-operations-benchmark/">www.mckinseyenergyinsights.com/services/performance-improvement/benchmarking-diagnostics/global-operations-benchmark/</a>)</td>
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<tr>
<td>Challenges</td>
<td>Potential solutions</td>
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<td>Mining historical data is extremely resource intensive and expensive.</td>
<td>Treasury should be approached to fund the conversion of selected historical data into ICMS format. This might be facilitated by the appropriate IT. It may make more sense to focus on the future rather than attempting to analyse the past. Increased standardisation associated with off-site manufacture should make it easier to collect data. For the future, there are benefits in ensuring that contract sum analyses and target costs are structured in a consistent way.</td>
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<td>The uptake of digital solutions in the industry, particularly among estimators is poor compared with other industries such as manufacturing.</td>
<td>It might be possible to develop suitable training programmes built around an electronic version of ICMS. This issue will decrease in importance as the next generation of quantity surveyors and estimators enters the industry.</td>
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<td>The quality and level of detail of data available changes as a project matures. Data must be compared at the same point in the funnel of uncertainty.</td>
<td>ICMS should require the specification of the project stage at which the costs were prepared and the quality of the data used in their preparation.</td>
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<tr>
<td>Clients and contractors use the data in different ways and for different purposes. How can these differences in use be reconciled?</td>
<td>RICS should seek to understand this challenge in more detail.</td>
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<tr>
<td>How can anything we do now be future-proofed against technological and other change?</td>
<td>RICS should seek to understand this challenge in more detail.</td>
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<td>How do we deal with R&amp;M?</td>
<td>Sharing data relating to capital costs is difficult enough. We should not further complicate the picture by attempting to address costs-in-use until the process of capturing and sharing capital costs is well established.</td>
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5.0  Key points for further debate

1 The benefits of sharing data seem to be well recognised by clients, consultants and, to a lesser extent, contractors. The willingness to share appears to be proportional to the perceived benefits. Is this a true reflection of the appetite for data sharing?

2 How can clients and their supply chains be incentivised to collect data that is comprehensive, and robust, and for which the context is properly described?

3 Should RICS be pressing for clients, especially government, who are the ultimate beneficiaries of data sharing, to write into their specifications the nature of the data they require and the way it is to be collected and reported?

4 Should these same clients be required to pay for the cost of data collection and analysis?

5 Should RICS take the lead in setting up, managing, quality assuring and analysing a data repository? If so, how should it be funded?

6 Is ICMS the appropriate vehicle through which to standardise the process of cost collection and analysis?

7 Should there be research into:
   – the business models used in other industries such as oil and gas and the way they collect data
   – the challenges in understanding the ways in which data is used, and how it might be future-proofed
   – the extent to which advances in technology will facilitate data collection in the future
   – the impact of off-site manufacture on data collection and
   – how BIM and AI can provide an opportunity to collect and interrogate data in a form which is of value to all parties.

Call to action

This insight paper will be widely distributed to elicit more comprehensive and representative views from the industry and its clients. If the industry is supportive, RICS should lead in taking advantage of the opportunities presented in this paper.
Glossary of acronyms

**BIM** – building information modelling
**BCIS** – Building Cost Information Service
**BoQ** – bills of quantities
**DIT** – Department for Transport
**ICMS** – *International Construction Measurement Standards* (www.icms-coalition.org)
**IPR** – intellectual property rights
**PQS** – private quantity surveyor
**RICS** – Royal Institution of Chartered Surveyors (www.rics.org)
**SMM7** – *Standard Method of Measurement*, 7th edition
Confidence through professional standards

RICS promotes and enforces the highest professional qualifications and standards in the valuation, development and management of land, real estate, construction and infrastructure. Our name promises the consistent delivery of standards – bringing confidence to markets and effecting positive change in the built and natural environments.

### Americas

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