

Implementing Lean in construction

*selecting and working
with a Lean consultant*

Nigel Fraser, West One Management Consulting Ltd

Feedback

CIRIA and the project steering group welcome your feedback on the documents in the Lean series.

However, before reading this guide, and without reference to the contents list, please write down five areas or specific questions that you are hoping the guide will help you with.

We invite you to list these points, and the extent to which they have been covered, in the Lean questionnaire, which can be found at: www.ciria.org/service/lean



Implementing Lean in construction: selecting and working with a Lean consultant

Fraser, N

CIRIA

C729

© CIRIA 2013

RP978

ISBN: 978-0-86017-731-9

British Library Cataloguing in Publication Data

A catalogue record is available for this book from the British Library

Keywords Lean construction, change management, construction process, improvement, innovation, knowledge management, productivity, supply chain	
Reader interest Supply chain business improvement, project management	Classification Availability Unrestricted Content Advice/guidance Status Committee-guided User Business improvement managers, senior management, Lean champions, HR and skills managers

Published by CIRIA, Classic House, 174–180 Old Street, London, EC1V 9BP, UK

This publication is designed to provide accurate and authoritative information on the subject matter covered. It is sold and/or distributed with the understanding that neither the authors nor the publisher is thereby engaged in rendering a specific legal or any other professional service. While every effort has been made to ensure the accuracy and completeness of the publication, no warranty or fitness is provided or implied, and the authors and publisher shall have neither liability nor responsibility to any person or entity with respect to any loss or damage arising from its use.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, without the written permission of the copyright holder, application for which should be addressed to the publisher. Such written permission must also be obtained before any part of this publication is stored in a retrieval system of any nature.

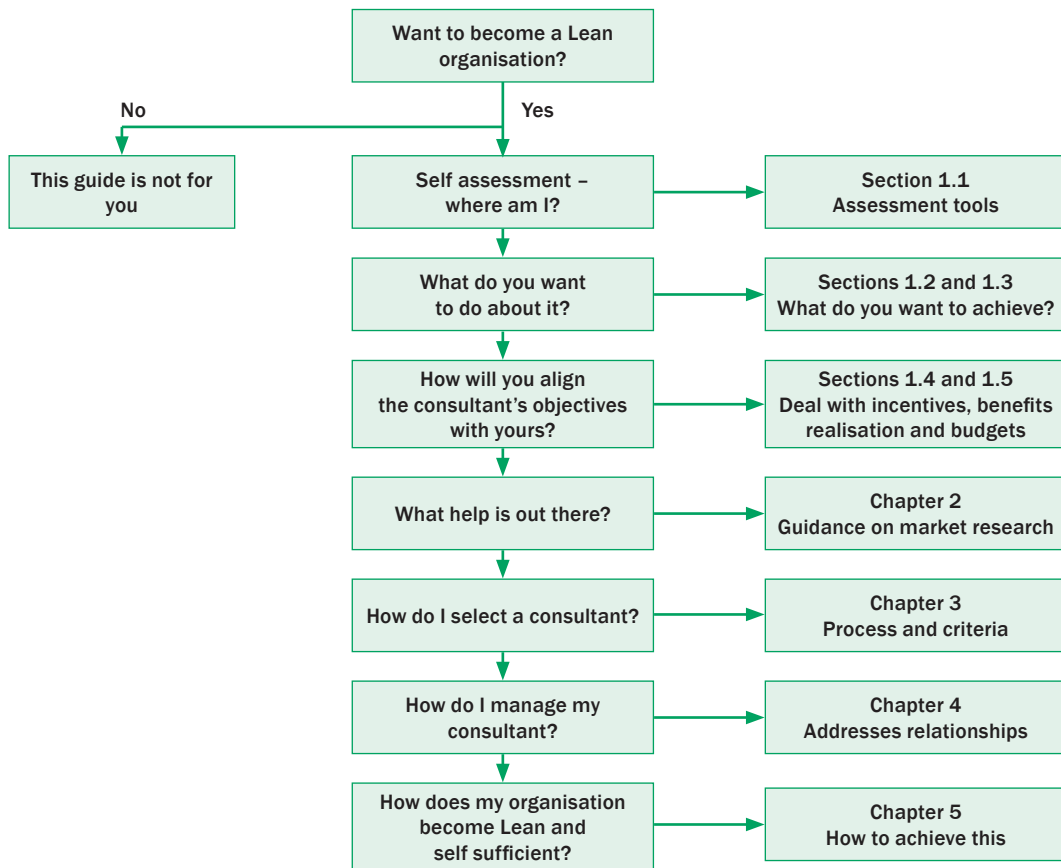
If you would like to reproduce any of the figures, text or technical information from this or any other CIRIA publication for use in other documents or publications, please contact the Publishing Department for more details on copyright terms and charges at: publishing@ciria.org Tel: 020 7549 3300.

Why read this guide?

You have already explored the principles of ‘Lean’ and how they may be applied to construction. You may want to assess the size of the opportunity for your organisation or need help with implementing a Lean based improvement programme. You may have achieved a degree of progress within your own organisation and now wish to build on it or extend it into your supply chains and client projects. To do this you may be considering how to develop your own team or bring in expertise to work with you and your suppliers.

Reading this guide will help you assess what your organisation needs, identify potential consultants, procure their services effectively, have a productive relationship with them and develop your organisation’s internal capabilities for the longer term. Implementing Lean is a continuous improvement programme, which is likely to need significant consultant support to get it established efficiently and effectively.

This guide has been authored and reviewed by individuals who have considerable experience of applying Lean principles to construction in the UK, both as clients and suppliers of Lean consulting services.



CIRIA Lean guides
 This guide is one of a series of publications and, together with an overview document, can be found at: www.ciria.org/service/lean

- C725 Lean and BIM (Dave, B, Koskela, L, Kiviniemi, A, Owen, R, Tzortzopoulos, P)
- C726 Lean and sustainability (Corfe, C)
- C727 Lean benefits realisation management (Smith, S)
- C728 Lean client's guide (Chick, G)
- C729 Selecting a Lean consultant (Fraser, N)
- C730 Lean tools – an introduction (O'Connor, R and Swain, B)

Acknowledgements

This guide was written by West One Management Consulting Ltd under contract to CIRIA

Project steering group

Terry Stocks (chairman)	Ministry of Justice
David Adamson	Sellafield Ltd
Chloe Chen	Highways Agency
Jai Dalal	Morgan Sindall
Colin Evison	BAM Nuttall
Lynne Hamilton	Anglian Water
Bill Heyes	Kier
Alan Hodges	BAM Nuttall/Construction Skills
Owen Jenkins	CIRIA
Jonathan Morris	Skanska
Ian Rehnard	Interserve

Author team

Gerry Chick	BRE/Collaborative improvement
Claire Corfe	BRE CLIP
Bhargav Dave	University of Salford
Nigel Fraser	West One Management Consulting
Arto Kiviniemi	University of Salford
Lauri Koskela	University of Salford
Richard O'Connor	Transform Business Ltd
Robert Owen	Institute for Future Environment
Stuart Smith	Bourton Group
Brian Swain	Brian Swain Ltd
Patricia Tzortzopoulos	University of Salford

Lead author

Nigel Fraser MSc BSc DipM MCIP MAPM

Nigel has spent much of the last decade working to improve the application of Lean principles in the construction sector, having previously done so in the automotive and aerospace sectors. He has held senior positions at BAA as head of product and manufacturing development and head of systems and standards. He has chaired CIRIA's Construction Productivity Network, is a member of the Executive of Buildoffsite (since its formation in 2004) and is a member of the Governing Body of BRE Global Ltd. He is a member of the Cabinet Office BIM Strategy Task Group. He has also both procured the services of Lean practitioners and successfully won appointments as a consultant in this area. He is a visiting lecturer at Manchester University.

The author would like to acknowledge the support and guidance received in preparing this, from the other authors in the CIRIA Lean team, in particular Brian Swain, Gerry Chick and Stuart Smith.

Jonathan Morris and Terry Stocks kindly provided the information for the two case studies.

Funders

BIS, BAM Nuttall, Construction Skills, Highways Agency, Sellafield Ltd, Skanska

Contents

Why read this guide?	iii
Acknowledgements	iv
Case studies	v
Figures	v
Tables	v
Introduction	1
1 Developing the brief	3
1.1 Client self-awareness, current and future objectives.....	3
1.2 Matching aspirations with self-awareness.....	3
1.3 Identifying objectives and benefits to be delivered.....	4
1.4 Incentives and benefits realisation.....	6
1.5 Establishing the budget and timing.....	6
1.6 What pre-requisites are required?.....	7
2 Market research	8
2.1 Scope of research.....	8
2.2 Qualifications and accreditations.....	9
2.3 Establishing what support and services are available, on what sort of contract and cost.....	9
3 Procurement process and supplier selection	11
3.1 Considerations when determining the process.....	11
3.2 A tender template (suggested areas for consideration).....	12
4 Building and maintaining the supplier relationship	15
4.1 Inductions and introductions to the wider team, developing the programme.....	15
4.2 Visibility of project pipeline and early involvement.....	15
4.3 Monitoring performance, administering the contract.....	15
5 Becoming a Lean enterprise	16
5.1 How training and consultancy work together.....	16
5.2 Continuous improvement from your consultant.....	16
5.3 Capturing knowledge and reusing it.....	17
5.4 Achieving sustainable implementation with internal resources.....	17
6 Conclusion	18
References	19
Case studies	
Case study 3.1 Skanska.....	12
Case study 3.2 The Ministry of Justice.....	14
Figures	
Figure 1.1 Consultant support options.....	2
Figure 1.2 You, your organisation and your consultant.....	5
Tables	
Table 3.1 An example of a scoring system.....	14

Introduction

You have identified that Lean offers a way of improving your organisation. You have probably already identified a range of benefits that you understand a Lean approach can deliver, ideally having referred to Chick (2013). These benefits are likely to be in terms of:

- ▶ reducing operating costs through the minimisation of non-value adding activities
- ▶ winning a higher proportion of bids through a better understanding of what represents value to the client and focusing on it
- ▶ being able to deliver the project more quickly with a more consistent work flow
- ▶ at a lower cost having reduced the amount of waste
- ▶ with less labour on site
- ▶ a lower degree of risk and a safer environment
- ▶ producing the right quality product
- ▶ establishing a culture that rigorously works to continuously improve the performance of the business.

You may be completely new to Lean or may be implementing it. In either case it is advisable to be aware of where you currently stand on the journey to becoming a Lean organisation, running Lean projects that deliver exceptional value to clients.

You recognise that you need advice on how best to move forward and you equally recognise that the application of Lean can take many forms and choosing the right advice will be vital. This guide will assist you in selecting the right consultant for your particular enterprise. One who will help you:

- ▶ with your understanding of maturity in your organisation
- ▶ consider how to apply Lean to what parts of the organisation, over what time frame
- ▶ understand what support you may need to obtain from a consultant
- ▶ identify the aspects of the business that can gain most and from which types of Lean related consultancy (Lean Six Sigma, Lean Construction etc)
- ▶ get buy in from stakeholders
- ▶ handle the relationships between the consultant and your various internal and external stakeholders.

It can also be useful to work with a consultant when preparing the procurement process for resources to deliver the larger task of changing the organisation.

The way you want or need to work with the consultant to achieve the desired outcomes may also vary and is likely to take several forms. A matrix approach is illustrated in Figure 1.1.

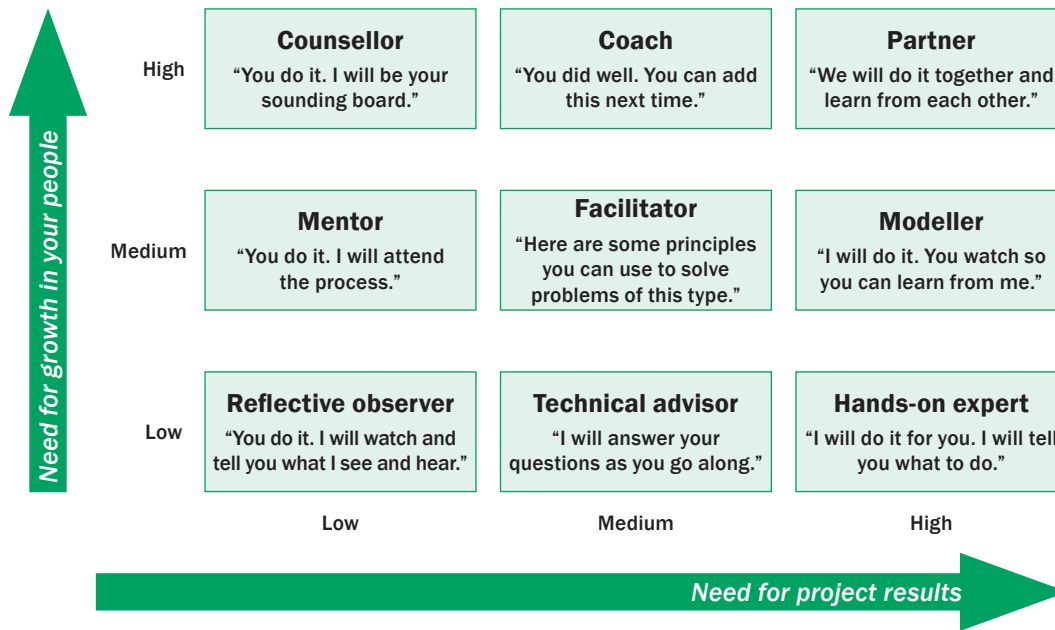


Figure 1.1 Consultant support options (courtesy The Bourton Group 2010)

Whatever your requirements, this guide is aimed at helping you obtain the support you need effectively.

Developing the brief

This chapter considers how you assess where you are currently on your Lean journey, what you are trying to achieve and how this fits into the wider business strategy (objectives, culture etc). How you are planning to approach it within the range of possibilities (eg from trial projects, through to organisation wide) and defining what success would look like to you. Where do you think you will need external support?

You may need the consultant to help you assess this and to work with you to identify the future state you aspire to achieve. With these identified you can then work out the route to take from the current state to the future objective. How will you share the vision with others in the company and involve them in bringing it about and making it stick, ideally without the need for consultants in the longer term? By doing this you will transform the rate at which the business improves, year after year.

1.1 CLIENT SELF-AWARENESS, CURRENT AND FUTURE OBJECTIVES

There are numerous ways of measuring how mature the client's Lean culture is today, eg by using a simple matrix. You may want to use one of these tools to do your own assessments of where you are and where you want to get to. However, if you are new to Lean, it is more likely that you will include doing this or drawing up a list of assessment criteria for your business in the brief of the consultancy services that you plan to procure.

Build Lean (Terry and Smith, 2011) contains one such tool. *The 20 Keys* considers 20 subject areas such as Lean awareness and understanding through to Lean problem solving, Lean capability building and developing collaborative relationships and partnerships. It allocates one of five pre-defined levels of maturity to each. These five performance levels range from 1 (traditional) through to 5 (currently invincible), so you should find one that applies!

Different consultancy firms are likely to have their own preferences as to how they approach this subject, which is common to most Lean continuous improvement programmes where the starting point, often referred to as 'the current state', and the position that the client will work towards, 'the future state', may be defined in terms of Lean maturity. Some clients, have developed their own maturity assessment model, The Highway Agency's HALMAT model is available from their website. Defining such a model is costly and only necessary if you are working in a large organisation with a very specific range of activities. It would be advisable to use the approach recommended by the consultants that you ultimately appoint rather than be prescriptive before their appointment.

1.2 MATCHING ASPIRATIONS WITH SELF-AWARENESS

The toolkits mentioned in Section 1.1, and others like them, provide several ways of defining

where you want to be in the future and measuring progress. Use them, within the context of your wider business strategy and plans, to outline your business Lean goals and aspirations. It is advisable to define some intermediate steps and establish target dates for achieving them.

Changing an organisation's culture is notoriously difficult. People will need to re-learn ways of doing things that they may already have fixed ideas about. Their perception of best practice may be very different from the potential approaches that result from applying Lean thinking. Sometimes the conclusions may be counter-intuitive. Examples of this could be not making do when the right information or materials are not available or moving away from large batch production to (ultimately) create single piece flow (ie production where the batch size is one and work in progress inventory is minimised). An experienced consultant will be able to guide you on this.

Similarly, Lean construction is not a new concept. There may be members of the team who have tried it before and not achieved the desired outcome. This may be the case where someone tried to impose it from the top of the organisation without achieving a basic understanding of what they were trying to achieve throughout the business. Construction is a risk-averse industry and project managers often want to deliver projects in ways that they know and are confident they can meet the expectations of their client. They are unlikely to change the way they do things just because someone tells them it is a good idea.

Fortunately there are also project managers and business leaders who have made Lean work in construction and they know how much easier and more predictable it has made their lives. When implemented well, with the right level of sponsorship, internal champions and expert advisors, the results can be stunning and sustainable. The key to success is bringing stakeholders with you along the journey. Allow time to spread the knowledge and share the learning from successes. Do not set over-ambitious targets in the brief if you are at the beginning of the journey to being Lean but equally provide incentives for exceeding them.

You are likely to need support from your consultant to guide you through managing this change process, bringing the stakeholders along with you.

1.3 IDENTIFYING OBJECTIVES AND BENEFITS TO BE DELIVERED

Having a degree of self-awareness will help you determine what you want to do. Do you want to start with your own organisation, your regular suppliers or on a project-by-project basis? Or do you want to take an holistic approach, looking at all of these?

Are you going to fund the whole change programme or are you going to incentivise suppliers to do it themselves by sharing benefits from savings and measuring their relative performance against their competitors? Either way, you will need to give it leadership and establish the funding mechanism to get the continuous improvement process going.

It is also worth considering some associated questions yourself before setting the objectives, such as:

- 1 How will you align the consultant's objectives to your business strategy, giving consideration to both the enterprise and project team perspectives?
- 2 What is the type of culture that you think you want to create?
- 3 What support may you need, at what part of the project process (pre/post project contract, operations etc)?
- 4 How long would you hope your organisation would take to transform itself into a Lean enterprise?
- 5 What sort of support is expected of the consultant? Is it direction, delivery, or training, or a combination of these?

- 6 What are the target early adopter projects you intend to apply Lean to?
- 7 What will you and your colleagues look for as signs of success of your Lean improvement programme?
- 8 How will learning, particularly within project teams, be captured and retained for reuse?
- 9 Will the consultant need links between your department and other parts of the organisation's governance, finance department etc?
- 10 How might the consultant interface with your existing supply chain members?

How does the consultant fit it?

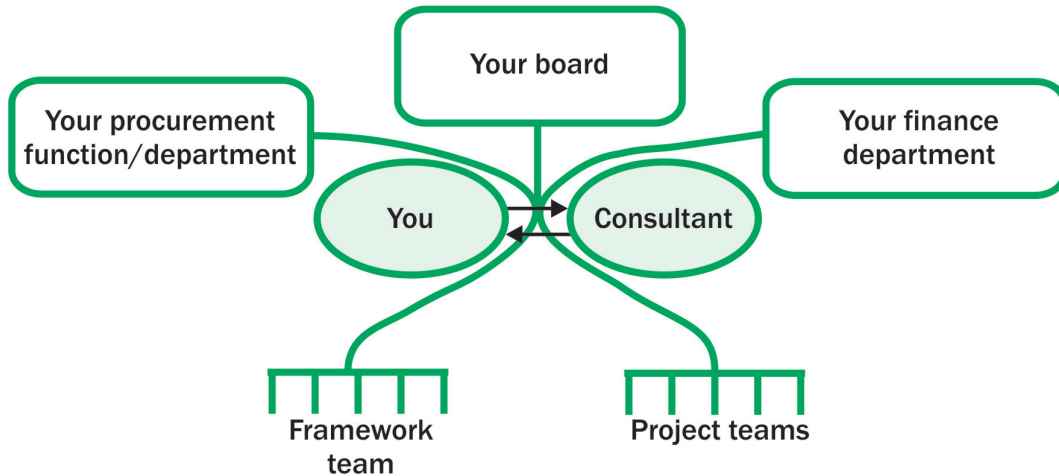


Figure 1.2 You, your organisation and your consultant

When selecting and appointing the consultant, having established the objectives, the delivery of the resulting benefits that are being targeted needs to be measured. The brief (and contract) will need to address who will measure them and how the results may be used. While most can be expressed in monetary terms, there are others, which are better expressed in other ways. There is a wide range of ways of measuring the implementation of a Lean improvement programme. These may include:

- ▶ progress in establishing the policy deployment team
- ▶ Lean awareness and competence levels within the business and its supply chains
- ▶ progress with target projects
- ▶ use of collaborative planning that addresses constraints, resulting in shorter and more predictable programmes
- ▶ routine use of structured, root cause based, problem solving techniques
- ▶ reduced cost, risk, rework, waste to land fill, lost time, learning lost (see Fraser and Kelly, 2011)
- ▶ increased overall activity effectiveness (a form of productivity measurement)
- ▶ on time, in full deliveries (of information and product or service)
- ▶ the use of visual management tools
- ▶ the financial measures such as return on investment, improved cash flow, accuracy of forecasts and reduced inventory held because of the improvement activities
- ▶ business specific aspects such as minimising the effect of construction activities to ongoing operations of the client or reducing the number of people requiring security clearance to work on site

- ▶ location specific aspects such as limiting the impact on the local community or managing logistics for constrained city centre projects
- ▶ evidence of learning being reused.

Whichever measures you decide to apply, they need to be agreed with stakeholders and base lined so that progress can be measured against them. Benefits realisation from Lean is considered in more detail by Smith (2013).

Some people believe in the axiom ‘if you don’t measure it, it will not be managed’. However, looking at measurement from a Lean perspective, only measure something if the resulting measurement continues to provide direct value to you or your client. You may start measuring more aspects than you need to reducing them as the level of maturity of your organisation increases.

1.4 INCENTIVES AND BENEFITS REALISATION

Appointing a Lean consultant may initially seem to be an obvious candidate for establishing some form of remuneration system based upon results. However, while desirable, this is more difficult in practice than might be expected. The primary reason for stating this is that often the results of individual bottom up improvement activities in a focused area may not affect the overall process proportionately. For example, a time saving of two days for a particular project activity may save the direct resource, but if the overall project duration is not affected the benefit is limited. However, if it is on the project’s critical path or removes a bottleneck, the saving may be multiplied many times. It is also possible to spend as much resource evaluating savings as generating them, in which case it will not happen. For these reasons it is recommended that incentives, if used, should be applied at the macro level, ie for a project, programme or at organisation level. This will encourage the desired behaviours while avoiding the creation of a bureaucracy to implement it.

Such incentives need to be linked to the pre-defined benefits realisation targets that the organisation is setting out to obtain. As mentioned in Section 1.3, Smith (2013) will provide more information.

The more ambitious client may be tempted to use an innovative process, effectively collaborating with the consultant to establish a novel way of working. In such an instance there is potentially both risk and opportunity and a collaborative approach should consider the potential for both pain and gain sharing (while taking into account the size of the supplier of the consulting services).

Another aspect to consider is the duration of the contract or framework arrangement and break clauses if benefits are not being delivered in excess of any pre-agreed minimum requirements. If the contract is designed to change an organisation’s culture the relationship with the supplier is likely to last much longer than if it is purely to deliver training. A longer term contract can be an incentive, as it reduces the risk of each transaction being considered in isolation. However, it should be accompanied by targets for continuous improvement of the supplier’s own performance to avoid complacency developing.

1.5 ESTABLISHING THE BUDGET AND TIMING

To get the most out of this important appointment, it is important to understand the market context from both the client’s and the potential suppliers’ perspectives:

- ▶ allow time for market research before finalising the brief
- ▶ be realistic in assessing the content of the brief with respect to budgets and timing
- ▶ estimate how long the procurement process will take, within the context of any applicable rules (eg EU regulations for public bodies and utility companies and internal quality assurance and procurement processes)

- ▶ consider how long you want the contract to last
- ▶ determine what internal resources will be involved to (a) procure and (b) implement Lean.

1.6 WHAT PRE-REQUISITES ARE REQUIRED?

The procurement process and supplier selection (Chapter 3) suggests questions to ask potential consultants and approaches to scoring responses, but there are some general points that should be considered at the start. When setting the requirements brief, avoid cutting and pasting inappropriate terms and conditions from your other professional services contracts. You are not going to be appointing a designer so do not require professional indemnity insurance that is defined in relation to a designer's responsibilities. Be specific. In general, if you have a requirement it will be priced into the consultant's response. Also, try to avoid putting too many barriers in the way and reducing your available options.

Some potential considerations

- ▶ do you require a non-disclosure agreement to be signed, if so for what scope (purpose) and for what duration? Aim to keep it simple
- ▶ consider what you need with respect to ownership terms for intellectual property (IP) created during the contract. What licences you need for ongoing use of background IP and who will own the new foreground IP created under the contract. Would you be happy for the supplier to reuse the work with another client? If so, on what terms? It is best to be clear on this at the start
- ▶ will access to construction sites be needed on a regular basis? If so are suppliers required to have third party accredited health and safety passes so as to minimise the disruptive cost of them having to be accompanied during site visits?
- ▶ are there requirements to have resources available within certain notice periods? Are these achievable by the type of suppliers that are being targeted?

2

Market research

When buying anything it pays to have some idea of what is available and the costs and benefits involved. This is no different. You should make yourself aware of what types of consultants and methodologies exist. How can you identify suitable consultants and what criteria can you use to judge potential consultancy support?

2.1 SCOPE OF RESEARCH

In this field, the internet is a good starting point but many Lean consultants rely on reputation rather than advertising. Also, you are advised to seek recommendations from other clients and your existing suppliers.

In the UK, several of the multi-disciplinary design firms offer specialist services in this area although their websites are not always explicit on this.

Also, there are numerous specialist consultancies in this area.

There are new companies entering this market so it is worth doing your own searches.

Lean is often linked to various approaches to quality management. There are many synergies. The most common are probably those based on Deming's work (Deming, 2000) or Six Sigma™ developed by Motorola in 1986 (Pyzdek and Kellar, 2009). The latter is largely based upon the application of statistics and the analysis of variances. As

many improvement activities require both aspects, it is not unusual to find consultants offering both. Your development of the brief will be iterative and, as you understand what is potentially available, you may modify the brief to reflect your greater understanding of the market.

Different consultancy businesses will have widely differing scales and business models. Some may have many staff at varying levels of seniority and fee levels. Others may use freelance associates that they have previously assessed and worked with. If supporting a large-scale corporate change programme it may be necessary to work with a larger company that has a greater resource pool. However, in these circumstances it is important to establish whether the larger company has real construction project experience as well as the corporate change projects. The two are related but quite different in nature.

For smaller or more focused change programmes, the smaller firms may be more responsive and it may be easier to negotiate a lighter touch intervention programme. They may also have specialist competences not found in the larger, more general business improvement consultancies. When you have a motivated, willing internal team, it may be easier to become self-sufficient by working with a small group of consultants with relevant experience. The last decade has demonstrated that applying Lean principles to construction organisations is not just a matter of applying them as they have been in other manufacturing sectors.

Things to look for during your initial searches include:

- 1 What are the competences (qualifications and experience) and capabilities of a potential supplier?

- 2 What else do they do?
- 3 What sectors do they serve?
- 4 Have they worked with construction project delivery teams and lower tier construction product suppliers?
- 5 Are there case studies and evidence of savings in construction organisations and projects?
- 6 How do they approach applying Lean to the construction sector?
- 7 What training courses do they offer?
- 8 Who have they worked for?
- 9 What post project support can they offer?
- 10 What geographical coverage is available?
- 11 What proprietary products and services have been developed and are they relevant?
- 12 Are there opportunities to visit Lean organisations to see what good can look like?

2.2 QUALIFICATIONS AND ACCREDITATIONS

This sector is not rich in traditional qualifications. There are NVQs and MSc type qualifications being offered by a small number of organisations involved with Lean construction and there are moves to codify qualifications for all industry sectors. At the time of writing, it is not feasible to rely completely upon qualifications.

The Six Sigma community has an informal system with levels named after the coloured belts used in martial arts. A yellow belt signifies a basic understanding. Green belt training covers the methodology (Define, Measure, Analyse, Improve and Control, DMAIC) plus the tools and techniques in some detail. Black belt training does the same but applied to more complex situations. In addition to training, the informal accrediting organisations usually require evidence of applying it to projects and delivering a minimum level of quantifiable benefits, successful completion of end of course tests and, at black belt level, coaching green belt practitioners.

There are a few master black belt practitioners, usually the trainers or the leaders of teams within companies employing such staff. The employers and training companies generally determine whether a candidate has reached the required level.

Lean and Six Sigma are commonly found together because the tools and principles of each complement the other, however Lean emerged from the development of The Toyota Production System (Toyota does not use the coloured belt system to signify levels of competence) (see Liker, 2004).

The formal qualifications that do exist are relatively new and so, while they do add credibility, at this point most Lean construction practitioners that have real experience do not have such qualifications or claim to be Six Sigma black belts.

In conclusion, relevant track record, verifiable references and personal recommendations (or not) are important when assessing potential suppliers.

There have been attempts to improve the situation with respect to accreditation of Lean construction practitioners (eg as proposed by BRE). You may want to consider supporting such initiatives.

2.3 ESTABLISHING WHAT SUPPORT AND SERVICES ARE AVAILABLE, ON WHAT SORT OF CONTRACT AND COST

Many of the companies offering Lean construction consultancy are relatively small or the relevant teams within them are. So they are likely to be willing to discuss what they offer, the

types of contract they work with and rates that they charge. These market tests can be requested through a public request for information (RFI) based process or on a one-to-one basis. Your own procurement rules and processes may determine how this can be done. Similarly, a more formal pre-qualification questionnaire (PQQ) may be used.

Many Lean consultancies will rely on their track record, personal recommendations and their contacts to generate work and will not respond to opportunities to tender. Bidding can take up a lot of time and the outcome is unpredictable so companies that are effective at winning work through other means may opt out due to the perceived high opportunity cost. If there are companies you are specifically interested in, direct negotiations may be more effective.

Another potential source of information is tapping into the experience of other similar clients. If you are not a competitor of theirs, they may well share experiences and suggest consultants with whom they have worked.

There are also several sources of independent advice. Buildoffsite (managed by CIRIA) offers its client members an independent client advice service, generally free of charge. Some independent consultants may also be willing to act as advisors for the procurement process although they may be expected to exclude themselves from the parties competing for the main contract.

Procurement process and supplier selection

This chapter focuses on how you will procure and what criteria you are going to use to select consultants. It covers:

- ▶ questions to ask (defining the selection criteria)
- ▶ making sure that the relationship will work
- ▶ making sure you are not sold a 'standard' process and that the consultant will genuinely listen to your needs and offers a 'blend' of potential support
- ▶ whether you are using a consultant to build capacity or in a far longer advisory role or both?

Note that if you work for an organisation that has to follow the public sector and utilities related EU rules, often referred to as 'going through the OJEU process', consider that smaller consultancy businesses are unlikely to be monitoring the Official Journal of the European Union (OJEU) on a regular basis. If you want them to show interest in your invitation to bid, it is advisable to make them aware of the opportunity.

3.1 CONSIDERATIONS WHEN DETERMINING THE PROCESS

While the cost of such services must be managed, the most significant side of the equation is the value of the benefits you believe you will obtain from working with a particular supplier.

Analyse what you need and differentiate between the aspects that are relatively easy to procure to an acceptable quality level and those that are more challenging and for which other factors are more important. The latter might be in the area of the existing knowledge of your organisation or a particular production process that you are trying to improve. You may actually be trying to procure a range of services that are best supplied by more than one organisation.

Different organisations will have different commercial policies and regulatory compliance requirements, as mentioned previously with respect to EU regulations. Whatever the constraints, the client clearly has a range of options. You can procure through long-term framework contracts, through competitive tendering, one-to-one negotiation or simply on recommendation of a trusted advisor. The selection may be a one off or part of a long-term programme. You may be seeking one supplier or multiple suppliers.

The criteria for selection will be considered here, however it is worth considering, at a generic level regarding how the main criteria will be allocated weightings. In particular the probability of the future business benefits being achieved compared to the different fee levels sought by different suppliers, eg the price vs. technical competences vs. cultural fit vs. geographical locations or availability. Do any of these represent go/no-go considerations?

When planning the procurement process you should consider whether the potential suppliers are likely to have had experience of the process that is to be used. For example, if you are going to use an online procurement portal service, ensure that there is adequate briefing on how to access it and what needs to be submitted when.

Consider also how the opportunity will be promoted to potential suppliers.

If you want your supply chain to use the services of the nominated consultant, will services ultimately be procured directly by you or via others or by both routes? If via others, how much visibility of the transactions or control will you need?

If the Lean services are to be used both at the organisation level and within project teams, will there be different ways of accounting for each? Your responses to questions such as this will help determine how the contract(s) will be administered.

Case study 3.1 Skanska

Skanska has used two different approaches to securing Lean consultants. In its wider business it has found it useful to employ a small specialist consultancy firm with construction and collaborative planning experience with a view to developing their own capabilities. The consultants rotated between projects managing collaborative planning and running small improvement projects. However, when it came to working with the Highways Agency in a joint venture with the Balfour Beatty Group to widen the M25, there were going to be many opportunities for repetition and they wanted to learn quickly. For this a larger firm was employed with a different style. More direct training of employees (avoiding the use of Lean terminology), putting emphasis on consensus building, identification of critical aspects of the programme, running continuous improvement activities and measuring the benefits achieved (a 10 per cent reduction overall).

3.2 A TENDER TEMPLATE

Tender template (suggested areas for consideration)	
<i>Client</i>	
<i>The client</i>	Brief text – who are you, what do you do.
<i>Self-assessment</i>	Using the ‘20 keys’ guide or other. Provide a brief text on where you are.
<i>Expectations</i>	Provide a brief text on where you would like to get to, do you want a project based approach or a more holistic (business-wide) improvement?
<i>Specific goals</i>	What are your main goals, eg to improve profitability, reduce contract times by 10 per cent year on year etc?
<i>What do you want a consultant to do</i>	Brief text to give a high level guide to your expectations, eg a consultant to help you set up and embed a Lean system of work in your office/on-site/both.
<i>Where geographically, will you need them to operate?</i>	Be as specific as you can at this stage.
<i>Consultant requirements</i>	
<i>Previous experience</i>	
<i>Measurement of benefits</i>	
<i>Payment terms</i>	
<i>Award criteria</i>	
<i>Form of contract</i>	

Consultant quality/evaluation questions	
Q1	Based on the self-assessment expectations above, how would you go about approaching this commission?
Q2	Give two examples/references detailing previous similar assignments and outcomes achieved in the construction sector.
Q3	What is your approach to managing organisational change, what experience has the team got and how was it accrued?
Q4	Are you prepared to work in an open, collaborative way and can you demonstrate, with references that you have done so successfully before?
Q5	How would you interact with multiple levels within both the client organisation and its supply chain members? For example, how would you interact differently with designers and builders?
Q6	What is the range of capabilities that are available (eg Lean/Lean construction/Lean 6 Sigma/training/audit/coaching/process engineering/programming/continuous flow/constraint management/systems thinking/building information model management, integrated project delivery methods etc).
Q7	What training and other forms of knowledge development have resulted in the capabilities offered (eg research, publications)?
Q8	Do you have or are you willing to develop a capability to operate a competences certification scheme?
Q9	What differentiates your organisation from others? Do you have any proprietary products or services?
Q10	Have you worked with construction project delivery teams and lower tier construction product suppliers?
Q11	Do you offer generic Lean construction training courses?
Q12	How would you cover the geographical area of the client's operations?
Q13	Please provide a list of companies that you have worked with in applying Lean principles to construction design and delivery.
Collection	

The scoring methodology will need to work with the wider criteria that will no doubt be applied covering topics such as financial stability, criminal records etc. It is recommended that a score for unacceptable is included and that the acceptability level is sufficiently high in other respects to allow pricing to be a deciding factor. For example, if there are multiple candidates that meet the acceptability level in terms of technical competence and cultural fit, price can become the deciding factor. It is also advisable not to combine questions just to keep the overall number of them down. If a potential supplier scores high on one aspect but unacceptably low on the other of a complex question, how would you deal with it?

An example scoring system is given in Table 3.1. It is designed for selecting technically capable suppliers. In this instance, companies scoring 75 per cent or above would then be assessed based on price.

Table 3.1 An example of a scoring system (adapted from Ministry of Justice, courtesy Terry Stocks)

Score	Assessment	Interpretation
100	Excellent	Exceeds the requirement. Exceptional demonstration by the bidder of the relevant ability, understanding, experience, skills, resource and quality measures required. Evidence identifies factors that will offer significant added value.
90	Good	Satisfies the requirement and offers some additional benefits. Above average demonstration by the bidder of the relevant ability, understanding, experience, skills, resource and quality measures required. Evidence identifies factors that will offer some added value.
80	Acceptable	Satisfies the requirement. Demonstration by the bidder of the relevant ability, understanding, experience, skills, resource and quality measures required.
70	Minor reservations	Satisfies the requirement with minor reservations. Some minor reservations about the bidder's relevant ability, understanding, experience, skills, resources and quality measures required.
40	Major reservations	Satisfies the requirement but with major reservations. Serious concerns about the bidder's relevant ability, understanding, experience, skills, resources and quality measures required.
0	Unacceptable	Does not meet the requirement. Does not comply and/or insufficient information provided to demonstrate that the bidder has the relevant ability, understanding, experience, skills, resource and quality measures required. Little or no evidence to support the response.

Case study 3.2 *The Ministry of Justice*

The MOJ operate a Lean 'systemised' process for project delivery that has reduced the cost of delivery, reduced the outturn cost of projects, increased the on time delivery of projects and increased the predictability of spend forecasting and outturn cost. They developed their own Lean system, and used a Lean consultant in the role of mentor/critical friend. They felt they knew their business best and were best placed to identify and implement change. The role of the consultant was to help set reaching targets and to provide opinion, guidance and coaching as they developed their tools and process. Key points on their journey included:

- ▶ establishing why they needed to change
- ▶ developing a deep understanding of what they did
- ▶ developing new practice, tools and behaviour to address areas requiring improvement
- ▶ constantly using data to track improvements against agreed benchmarks
- ▶ maintaining good communications with in-house staff and supply chain and use them to help develop new practice.

The MOJ did not have a dedicated budget for the implementation of Lean, so they devised an approach that best used the skills of their own staff and supply chain, supplemented with 'light touch' coaching from a Lean consultant with specific expertise in their business area. They now have a small in-house team of staff whose role is to constantly monitor and support business and delivery improvement.

Building and maintaining the supplier relationship

This chapter looks at starting the journey together, the introductions to the wider team and agreeing performance measures, recording successes and failures in an open manner.

4.1 INDUCTIONS AND INTRODUCTIONS TO THE WIDER TEAM, DEVELOPING THE PROGRAMME

It is important to introduce the new consultants and those they will need to work with at the earliest opportunity. It is important not only to ensure that the consultants may work efficiently but also to ensure that the other colleagues and suppliers they are working with recognise that the consultant is working closely with you and has your confidence.

It is also important to involve them in the development of the change programme and to plan it with the consultant. The aim should be to achieve a situation where the internal team feel it is their plan, which the consultant is helping them to achieve.

4.2 VISIBILITY OF PROJECT PIPELINE AND EARLY INVOLVEMENT

Where the consultancy service is going to involve working with your construction supply chains for projects it is helpful to provide visibility of future potential workflow and providing the contacts for them to engage with early in the project life cycle. This will help keep them eager to perform so they are well placed to compete for future work, whether it is the Lean consultant or the construction supply chain.

4.3 MONITORING PERFORMANCE, ADMINISTERING THE CONTRACT

Good performance management requires reference benchmarks to be established early in the relationship or project and bought into by both internal stakeholders and the supplier.

Recording successes (and failures) is also important. Where feasible, getting independent validation of the claims, eg by another senior manager who is not directly involved. This may be the finance manager but does not have to be, as long as they are respected by the people who allocate budgets.

For the relationship to run smoothly, it is helpful to administer the contract efficiently and on time, in particular with respect to any pain and gain sharing provisions (if applicable).

5

Becoming a Lean enterprise

This chapter will discuss using consultants to grow capacity within the organisation, through training and knowledge capture and continuous improvement.

5.1 HOW TRAINING AND CONSULTANCY WORK TOGETHER

When defining your requirements, it is important to have a view on how you envisage training and consultancy (including coaching and mentoring) can be mixed effectively. The potential suppliers will no doubt bring new ideas to how they would approach this, however, it is a significant client consideration for several reasons. These include the time it will involve your staff committing to it and the scale of the budget, particularly if there is a significant amount of one-to-one coaching and mentoring over a sustained period. Relying upon training alone can be risky as the application of what has been communicated is often the more difficult part and it is important to help build the confidence of the change leaders within the client organisation who may be new to Lean. Changing your organisation into a Lean enterprise will not happen overnight. It is a cultural change. Your team and suppliers will need to re-learn how to approach tasks that they have already been doing in a way that they were comfortable with. There will be some resistance to change. An empathetic consultant will be able to work with your team members to guide them through this challenging transition. An arrogant, dogmatic one will create a different set of problems!

Managing change is a complex process. It not only involves new methods of working but just as challenging, taking the client organisation through a psychological evolution. This is beyond the scope of this guide but the consultant should be able to demonstrate that they understand the human side of the journey. It is important that they recognise that many in the client organisation will not see the need for change initially and may well resist it before becoming convinced and motivated. Experienced consultants will be able to demonstrate how they have engaged with teams and helped them develop their own Lean solutions. Do not expect Lean training alone to deliver change.

5.2 CONTINUOUS IMPROVEMENT FROM YOUR CONSULTANT

While the primary focus here will be improving your own organisation and/or your supply chains, if the contract is to last a significant period, it is important to ensure that the consultant is improving their own service and effectiveness. Incorporate a quarterly performance review process into the requirements. Set an expectation from the start. Solicit feedback from the people on the receiving end of training courses and coaching. Monitor project performance and review the rate of progress with the consultants. Continuously capture learning from the process of change.

5.3 CAPTURING KNOWLEDGE AND REUSING IT

Few managers want to rely upon external consultants for longer than they need to. They can be expensive and when they leave there is a risk of losing a lot of know how that has been developed during the contract. Worse still, it could be transferred to one of your competitors. Ensuring the consultant is building the in-house competences to permit the company to progress on the Lean journey should be core to the assignment's requirements. From the start, you should consider the sustainability of change and your exit strategy for the consultant.

As the contract progresses and lessons are learned (often because of problems arising), they need to be captured, understood and shared. One approach to this is by including cause and effect analyses where appropriate into regular project reporting.

Where lessons are learnt, aim to establish a record of best practice. These may come from an element of design that may be reusable or an improvement to a production process that can be captured in a revision to a methods statement. To do this effectively there are implications for other contracts used to procure a project (eg for the reuse of IPR in designs or standard processes that are developed). One way of doing this is through the creation of a library of Building Information Model (BIM) objects. However, reuse of a design or process must be subject to a review that it is safe and appropriate to do so in the new context.

5.4 ACHIEVING SUSTAINABLE IMPLEMENTATION WITH INTERNAL RESOURCES

In this area it is usual to take the approach of up-skilling existing staff rather than bringing in a completely new team. This includes expanding in-house competencies to include Lean processes, knowledge of the tools and when to use them and identifying a network of sponsors and champions. This is often accompanied by establishing a system of self-assessment. As mentioned in Section 5.1 coaching and mentoring will probably be needed to follow up the training provided in the earlier stages.

Creating and maintaining the right climate and culture has also been found to be vital. This is dealt with in some detail by Terry and Smith (2011), which refers to work by Isaksen and Akkermans (2007). It requires a challenging, trusting and open culture. One that encourages new ideas and debate, along with a willingness to take risks where appropriate.

Keep track of who has developed which competencies. Make it easy for managers to identify people within the organisation who may be able to help them. Encourage collaboration between functional departments.

Trust and value the newly developed in-house team's opinions. It can be very frustrating if project managers only trust external 'experts'.

Staff and supplier performance targets and appraisals should be used to reinforce this change process, aligning strategy, performance measurement and rewards systems.

6

Conclusion

Converting a typical construction related organisation into a Lean construction organisation is not easy. However, it can be achieved if approached systematically with the right high level sponsorship and commitment, access to expertise and enthusiasm. You cannot delegate leadership of this type of change programme to a consultant. They must be led from the top of the organisation by someone who is focused on making it work.

It is likely that the use of external consultants will be necessary but the procuring organisation needs to understand the opportunity, its requirements and how it will be procured before proceeding too far.

Getting the brief right is fundamental

The procurement process is challenging because the consultants that are appointed will, for a period, become an integral part of your organisation but you need to avoid creating a dependence upon them.

You will know when you have achieved it when you no longer need to rely upon the consultant and your organisation's own ability to consistently improve its performance is being demonstrated wherever you look. You will also notice that life is easier despite more output being achieved. You might miss the need to fire fight though!

References

- CHICK, G (2013) *Implementing Lean in construction: Lean client's guide*, C728, CIRIA, London (ISBN: 978-0-86017-730-2). Go to: www.ciria.org/service/lean
- DEMING, W E (2000) *The new economics for industry, government, education*, second edition, MIT Press, US (ISBN: 978-0-262-54116-9)
- FRASER, N and KELLY, L (2011) *Applying a balanced scorecard approach to waste reduction KPIs in Lean construction*, CIRIA Briefing, April 2011, CIRIA, London. Go to: www.ciria.org
- ISAKSEN, S and AKKERMANS, H (2007) *An introduction to climate – the situational outlook questionnaire*, The Creative Problem-Solving Group Inc, New York, USA
- LIKER, J E (2004) *The Toyota way: 14 management principles from the world's greatest manufacturer*, McGraw-Hill Professional, New York (ISBN: 978-0-07139-231-0)
- PYZDEK, T and KELLER, P A (2009) *The Six Sigma Handbook*, third edition, McGraw-Hill, New York, US (ISBN:0-07162-338-8)
- SMITH, S (2013) *Implementing Lean in construction: Lean benefits realisation management*, C727, CIRIA, London (ISBN: 978-0-86017-729-6). Go to: www.ciria.org/service/lean
- TERRY, A and SMITH, S (2011) *Build Lean. Transforming construction using Lean thinking*, C696, CIRIA, London (ISBN 978-0-86017-696-1). Go to: www.ciria.org