

## Lean Construction

The idea of Lean Construction has been around for a while, but interest in it has greatly increased following the publication in 1998 of the Egan Report on how the construction industry must improve its performance. Originally applied to manufacturing, the Lean approach is, in the words of Dan Jones and James Womack, 'doing more and more with less and less – less human effort, less equipment, less space – while coming closer and closer to providing customers with exactly what they want'. Here Brian Swain discusses how the ideas, tools and techniques that were developed in manufacturing can be transformed and transferred successfully to construction.

### Concepts underlying Lean thinking

Five pivotal concepts underlie Lean thinking, the first of which is **value**. All activities in any economic activity can be judged as to whether they add value, or cost, for the final customer. When they do not add value, they can be defined as waste that needs to be eliminated.

A product or service is created by a sequence of value-adding activities, known as a **value stream**. Defining a value stream, the second concept underlying Lean, allows management to see how things link together, and where value is added and waste is created.

The third concept is **flow**. In terms of Lean, value is created in a continuous stream, or flow, of activity with as little interruption as possible. Each value-added activity leads directly and immediately to the next.

Next there is **pull**. This is about only making what the customer wants, when the customer wants it. In practice an organisation seeks to establish communication systems that allow all aspects of the supply chain to respond directly to actual, real-time demand.

### Rubicon's web site

Please visit our web site at [www.rubiconassociates.com](http://www.rubiconassociates.com) and let us know what you think. If there is anything you would particularly like to see, do tell us.

Finally the Lean organisation is in a constant state of change, continuously engaged in improvement of its goods and services, always and relentlessly seeking **perfection**.

### Applying the Lean approach to construction

Two diagrams (on this page and overleaf) provide a basic model for sorting out how and where the Lean approach can be applied to construction. The first, 'Four spheres of construction', shows four definable areas of work in construction:

- client;
- information (generation);
- procurement;
- site construction.

These are sequential over time and distinctly different in nature and output. They are also generic areas of activity; the actual process varies widely in practice, which in itself is a huge source of confusion and misunderstanding.

The client dominates the first sphere in any project, being both the customer for the final product but also the first source of information about what the product needs to be. This relationship continues as the project progresses in a series of reiterative exchanges until the client is able to take possession of their building or engineering structure. How well this is

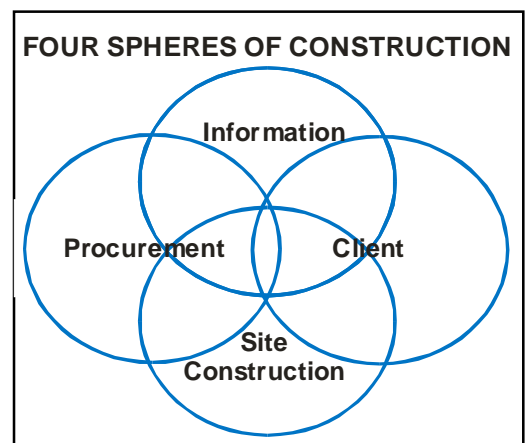
accomplished is critical to the success of any project.

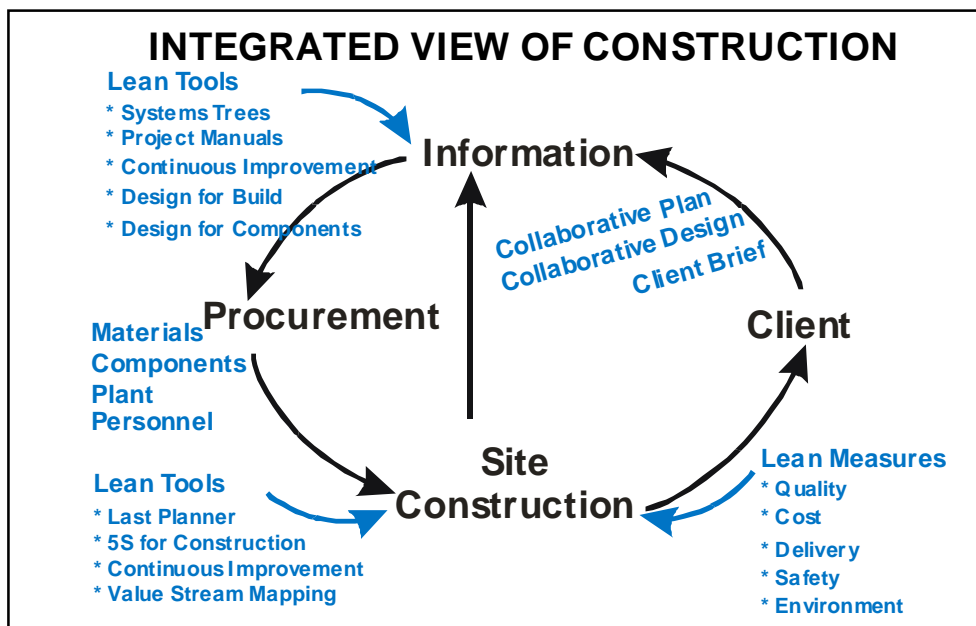
The next sphere is about the generation of information. It begins with the exchange of information about the client's needs, which are developed into a brief. This leads on to the design process, which moves through a number of iterations, and begins to involve members of the supply chain who contribute their technical and logistical expertise. Parallel to, integrated with and dependent on the design process are the cost-estimating and programme-planning processes.

Procurement comes next, engaging those people and companies who will actually supply the materials, components, people and plant (equipment used on site) to build the project. This, like everything else in construction, is not a straightforward set of sequential activities. Various suppliers are often required to contribute to the technical designs for the structure and will be engaged early on in the project.

The site construction phase of a project is where it should all come together. How well it does this depends on the quality of information in terms of design and plan, and on the on-time delivery of the right materials, components, people and plant. It also depends on site management, which is mainly logistics, and the capabilities and methods of the trades who do the physical work.

Seeing the spheres of activity as





sighted relationships. Partnerships throughout the supply chain are the answer to this, with a real commitment to working together on many projects over many years.

- Discipline at all levels and in every detail of operations cannot be left to the discretion of the individual trades and suppliers. There must be exact standards and rigorous adherence to them.
- Training and development at all levels of a supply chain are vital.
- Continuous improvement must be a cultural and operational reality.

interacting, overlapping and reiterative leads to the second diagram, 'Integrated view of construction'. This shows a complete system, with reiterations and eventually feedback to those people who generate information and guide (manage) projects. In future instalments of *Crosscurrents* we will be looking at the various techniques, such as Last Planner, Systems Trees and 5S for Construction, which appear on the diagram.

### Requirements for successful implementation

Lean is a strategic approach to business that can only be fully implemented over a period of two to six years. Results can certainly be achieved quickly. But the real, stunning benefits take time and persistence to be realised.

The following are key requirements for full implementation.

- Top management must provide active and persistent leadership throughout.
- Management should have a detailed understanding and application of the Lean concepts of value, value streams, flow, pull and perfection as they apply to construction.
- Stability must be brought into the whole process through the elimina-

tion of sources of variation – the cause of huge waste and cost.

- Lean logistics are essential. This refers to every aspect of the process, from how information is obtained from the client, and designs and plans are developed, shared and communicated, to the movement of materials, components, people and plant to and around the construction site.
- The construction industry is littered with inconsistency of methods throughout the supply chain. Uniformity of best practice is essential for improvement and high performance.
- Uniform measures of quality, cost, delivery, safety and the working environment are key to the continuous improvement of products and services. They must apply to every process, from the client brief through to final fit-out, and be supported by a system for reporting and acting on data.
- No organisation can achieve high performance by constantly changing the type of work it undertakes. Companies need to decide which product families (such as residential homes or commercial buildings) they are going to focus on, then stay with them and excel.
- World-class results cannot be realised with short-term, short-

There are many tools and techniques that can be used once these key elements are understood and there is a commitment to act. The benefits in undertaking this approach are survival and prosperity. It is now well known that a Lean approach can deliver substantial savings, better quality, more productivity and faster delivery. The question now is when is the UK construction industry going to seriously begin to implement this strategy?

### One-day workshop: Introduction to Lean Construction

Rubicon Associates have been running this workshop for nearly two years. It provides a hands-on introduction to the principles and practice of Lean Construction, showing how enormous savings and gains can be made by applying the tools and techniques of the Lean approach.

#### Dates and venues:

Tuesday 3 December, Swansea  
 Wednesday 4 December, Maidstone  
 Further dates in 2003

For further details, contact the office.

## Rubicon offers Benchmark Index

**A**lan Mossman and Andrew Scott are trained advisers and can now offer the Benchmark Index to clients. BMI is a diagnostic tool developed by the UK Department of Trade and Industry to help organisations compare their performance with any relevant profile of over 6,000 UK and international companies. It covers the areas of profitability, financial management, productivity, investment, growth, customer satisfaction, innovation, supplier management, and people management and satisfaction. It addresses common client issues such as productivity improvement, dealing with the threat of increased competition, tackling barriers to growth and attracting new investment.

We see BMI as a useful tool to use at the outset of any change initiative and to monitor subsequent performance improvement. Producing a comprehensive diagnosis, presentation and focused action plan normally takes between one and two days, depending on the size and complexity of the client organisation. Contact us for more information.

## Lean service design for a public utility

A public utility asked Rubicon to help it pilot the use of Lean Thinking in improving the way in which customers can communicate their own meter readings. Under the guidance of Rubicon, a project group mapped and evaluated the five existing channels that customers could use. A new instrument, the Value Rating Matrix, was created to assess the value to the customer, and the cost and benefit to the company, of each of the available channels. This clearly revealed wide differences in effectiveness, and led to actions to remove, replace or reinforce different channels.

Creative re-design sessions, guided by the five Lean Principles, also identified other options for both strategic and tactical improvements, the benefits of which were assessed for the two years ahead. Tactical improvements included the elimination of one of the channels, making the scripting of customer

documents clearer, and improving secondary processing for exception handling. These measures produced projected benefits of around £630,000 over two years, with improved customer experience.

Longer-term strategic improvements involved some technological development alongside better targeting of customers to request readings at certain points in the billing cycle, and were estimated to be capable of bringing cost savings in excess of £4.5m over two years as well as substantial benefits to customers.

All of these initiatives have now been or are currently being pursued, with significant benefits already achieved and more on the way. Following the success of this pilot, Rubicon was asked to train and accredit a cadre of internal 'lean practitioners' to support the further implementation of the approach across the organisation.

## Putting Rubicon on the map — some of the projects we're working on

We will be running the first **Introduction to Lean Construction** workshop in Scotland as part of the Spring 2003 series. Call the office for more details.

Brian ran a **partnering** workshop for a local authority where he used Boomwhackers for the first time to great effect.

Brian and John are working with **Pilkingtons** tiles on a lean transformation of the factory.

Alan is developing a **Last Planner** workshop for the construction and design sectors. It will pilot with CBPP on 10 December.

Jan is creating new **Conflict Resolution** and **Negotiation** workshops with Steve and George

Brian and Alan have helped **Mace** roll out a 5S (site housekeeping) programme at one of their sites at London Heathrow.

The first of a series of **Lean Production for Lean Construction** workshops runs in Durham on 21 November 2002 with support from CITB and *Rethinking Construction*. The workshop will enable you to see and understand the practical benefits a Lean approach can bring. Call the office for more details.

Brian and Alan are working with **Sheffield Construction and Building Services** on strategy and lean transformation.

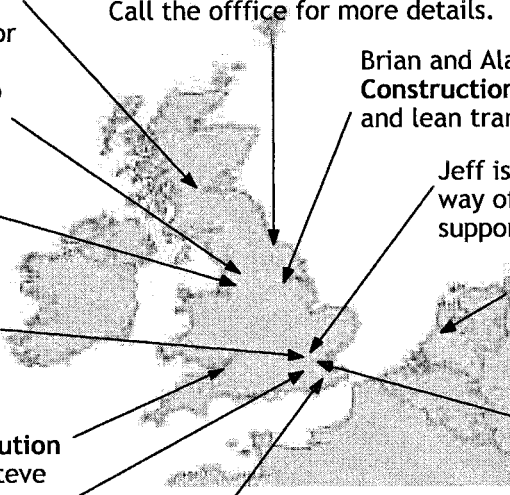
Jeff is helping **Accenture** develop a new way of harnessing CRM software to support business processes in **British Gas**.

Brian is working with **Corus Steel's** packaging division in the third year of a lean transformation.

John is helping staff at **London Taxi Int'l** install a new Cost Management System.

Steve & Belinda are working with **Rother Homes** on organisational structure, management development and a new appraisal system.

Steve has finished **Working it out**. Alan and Andrew have qualified to use the **Benchmark Index**. John has his **Six Sigma Black Belt**.



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**The Effective Negotiator****A two-day workshop on achieving successful business transactions and partnerships**

Everyone negotiates something everyday, even if they don't consider themselves to be negotiators in a formal sense. More and more aspects of our lives depend on successful negotiation - an essential skill for promoting co-operation and mutual gain.

Conventional approaches to negotiation can sometimes encourage unhelpful, adversarial techniques. Awareness of this has led Rubicon Associates to develop a two-day workshop in which participants learn how to become more effective in planning and conducting face-to-face negotiation and building co-operative relationships. The key is in the method of 'principled negotiation' (originally developed by Fisher and Ury of the Harvard Negotiation Project), which provides a set of universal negotiating principles that can be adopted and applied to an unlimited range of specific contexts.

Workshops can be delivered in-house or in open courses that are run in London and Bristol. Contact Steve Briault on 01892 771042 or Jan Swann on 0117 9633418 for further details and future dates.

**Handling Differences****A one-day workshop on handling conflict constructively**

The cost of conflict is high. It can seriously affect the financial stability and profitability of an organisation. It can do irreparable damage in familial and social relationships. Knowing how to recognise the early signs of conflict and being effective in mediation and intervention are therefore essential life skills.

Rubicon has developed this one-day highly participative workshop to enable participants to answer some of those all-consuming questions such as:

- How can I intervene effectively between combative colleagues and quarrelling team members?
- How do I confront my boss/my staff?
- How can I stop meetings degenerating?
- How can I resolve issues with the supplier before I phone my solicitor?
- How can we deal more effectively with customer complaints?

Participants will very quickly be able to assess their own reactions to potential conflict and manage their feelings more effectively. They will learn how to intervene constructively and how to build more effective relationships.

To discuss how we can help you and your organisation to become more 'conflict capable', contact George Perry on 01452 813262 or Jan Swann on 0117 9633418.

**Jan Swann**

Jan Swann, the latest person to join Rubicon, has worked most recently as an organisational development and training consultant primarily in the education and charities sectors, specialising in team/community building, management structure and relationship issues.

Formerly a teacher, Jan has also had a long career in advertising and marketing with a range of clients in local



government, utilities, manufacturing and retail. In joining Rubicon, she will continue to bring her marketing experience to bear, and in the training field will focus on the areas of building relationships, such as mediation, negotiation and communication.

Jan is based in Bristol and will be helping to develop Rubicon's work in the south-west.