



Supply chain integration, logistics and e-trading. Action learning project, Executive Summary

Background

This research project originated from the needs identified in the Accelerating Change report for a greater understanding of supply chain and logistics issues. Another important development that came out of the Accelerating Change report was the establishment of the Logistics Forum. The Forum published its initial findings during the course of this project. This enabled these findings to be explored as part of this research.

Introduction

In 2003 CITB-ConstructionSkills approved funding to run a two year project on supply chain integration, logistics and e-trading. Four lead contractors became project partners: Taylor Woodrow, Interserve, Denne and Wates, together with a team of consultant organisations: CITE (Construction Industry Trading Electronically), Synchro Limited, the Centre for Performance Improvement, Ray Elliott Consultancy and Robert Bilbrough Associates.

This briefing summarises the real challenges involved in developing integrated supply chains, logistics and e-trading, the lessons learnt, and recommendations to the industry's stakeholders.

Aim

The aim of the research project was to accelerate the take-up of integrated supply chains and logistics within the construction industry. This was achieved by applying action research within live construction projects in order to identify learning outcomes, draw conclusions and make recommendations for wider dissemination.

Conclusions

The research has led to the following conclusions.

1. The industry is at the start of a long journey to develop integrated supply chains.
2. The process of developing integrated supply chains is likely to involve incremental improvements rather than step-changes.
3. Construction costs, time and quality can be improved significantly by the client and the supply chain working as an integrated team.
4. There are significant areas of logistics management that the industry can improve, enabling projects to be delivered faster and more profitably.
5. Existing supply chain members need training and development in people, technical and process skills.

6. Management skills training across the supply chain is required in areas such as critical activity chains, task sequencing, resource balancing, supply chain collaboration, project synchronisation, value management and computer literacy.
7. Lead contractors have a key role in the training and developing of their supply chains.
8. Owing to years of adversarial relationships there is still a great deal of suspicion and mistrust between some supply chain organisations.
9. Construction clients have a key role to play in generating positive change in the industry by demanding integrated supply chains and monitoring their performance.
10. The software and construction industries need to develop common information exchange standards to enable interoperability.

Lessons learnt

Integrated supply chain lessons learnt

1. An integrated supply chain requires a steady workflow.
2. Work should be let on the basis of supplier capacity and capability rather than just price.
3. Integrated supply chains require accurate and timely information flow and agreed design freezes.
4. Integrated supply chains are most effectively developed for long-term framework arrangements or large projects.
5. Integrated supply chains are founded on sound project management principles, practices and processes.
6. Supply chain organisations should be engaged at the earliest practical stage in a project's development.
7. Supply chain organisation leaders should be trained to support effective teamwork.
8. Supply chain organisation leaders should review the team's integration process on a regular basis.
9. Supply chain members should agree upon common objectives, understand each others' requirements, and identify and resolve key issues.
10. Supply chain 'clusters' should meet to identify the issues, requirements and actions.
11. Lead contractors should take responsibility for training and developing their supply chains.
12. Lead contractors should be prepared to lead inexperienced or indecisive clients.
13. Lead contractors should review their existing management systems, procedures and documentation to ensure they support integrated supply chains.
14. Regular team health checks should be made and improvement action taken where necessary.
15. Construction managers should be trained to understand supplier interface and installation issues.
16. Contractors and suppliers must understand each others 'costs' rather than 'prices'.
17. All workers should be trained in missing supply chain skills and knowledge.

Logistics lessons learnt

Logistics is the term used to describe the physical and management processes which aim to optimise the flow of goods, materials, equipment and people from their source to the point of use.

For any activity or task to be performed the following conditions must be satisfied:

- the timely availability of appropriately skilled labour and management
- the timely availability of specified materials and components
- the timely availability of suitable plant and equipment

- timely and accurate design information
- timely access to the work area
- timely and quality completion of the previous task
- an agreed method and permissions in which to operate
- acceptable working conditions and environment.

If one of these conditions is not satisfied then the construction process is likely to be delayed. Logistics management is the process of co-ordinating resources to achieve the above conditions.

1. Efficiencies in operational matters within logistics management do not necessarily improve the effectiveness of the construction process, e.g. budget, programme and quality.
2. Focusing on logistics management assists in identifying 'waste' (anything that does not add value).
3. Successful logistics management requires investment in site preliminaries (e.g. plant and equipment) and supportive management practices (e.g. logistics plan).
4. An effective logistics system cuts the number of suppliers, reduces materials movement onto and around site, minimises materials stored on site and tracks goods, materials and people.

E-trading lessons learnt

The term e-trading is used in this report to describe the electronic transmission of business documents (such as orders, invoices and dispatch notes) between trading partners, using appropriate document information exchange standards.

1. There is considerable interest in the use of tried and tested mobile technology, such as bar-codes and RFID tags (Radio Frequency Identity) but a reluctance to invest in development. **However.....**
2. The development of construction e-trading requires the commitment of the whole supply chain to agree and achieve clear objectives and invest in the necessary development resources and training required.
3. It is essential that the industry develops common 'information exchange standards' to enable the supply chain members' computer systems to communicate with each other.
4. There is a reluctance within the construction supply chain to change existing administrative systems.
5. E-trading is not a high priority development with construction supply chain members.

IT- based logistics lessons learnt

1. The supply chain must agree that logistic improvements can be made.
2. The supply chain must agree on the IT-based logistics management solution.
3. The system must operate flawlessly.
4. The user interface must be simple and effective.
5. Never underestimate the lack of IT readiness of supply chain members.
6. Never underestimate the time necessary to learn and use a new system.
7. Executive sponsorship and support is essential for successful implementation.
8. Implement with the aim of gaining some early wins.
9. Users must fully understand the importance of the logistics management system.
10. Effective and efficient IT support is required to support the introduction and maintenance of the system.
11. Users must be fully engaged in the planning and implementation of the systems.
12. Sufficient time and hardware resources must be made available.
13. An integrated supply chain is a prerequisite for successful implementation of an IT-based logistics system.

14. Traditional project management structures are inappropriate to support the effective planning, implementation and use of IT-based logistics systems.
15. A prerequisite for successful implementation is skills training in areas such as critical activity chains, task sequencing, resource balancing, supply chain collaboration, project synchronisation and computer literacy.
16. A complete set of key performance indicators must be agreed with the supply chain and built into the process model.
17. Interoperability issues between an IT-based logistics system and other IT systems must be resolved prior to implementation.
18. IT-based logistics systems are most appropriate for long-term framework arrangements and large projects with long lead-in periods.

Key recommendations

As a result of the project the following recommendations are made to the industry's stakeholders.

Clients and client organisations

- Appoint contractors committed to improving supply chain and logistics performance.
- Demand and reward supply chain improvements and monitor performance.
- Involve your construction supply chain at the inception stage of a capital project.
- Use procurement methods and contracts that support and encourage supply chain integration.
- Encourage electronic project collaboration.

CITB-ConstructionSkills

- Set and agree construction supply chain and logistics training and qualification development targets.
- Use the CITB Grants Scheme to support and encourage lead contractors and their supply chain to work in partnership to train and develop their workforces' production, supply chain and logistics skills.
- Use the CITB Grants Scheme to support and encourage specialist contractors to improve their workforces' productivity through training.
- Work with other Sector Skills Councils in order to support and encourage manufacturers to train their specialist contractor supply chains.
- Support research, development and training in order to accelerate the use of e-trading within the construction industry.
- Update existing S/NVQs to ensure that the industry has modern supply chain and logistics qualifications.

Contractors

- In partnership with designers and suppliers, identify, plan, and action supply chain and logistic improvements.
- Lead contractors should implement supply chain and logistics skills development programmes for their own staff and supply chain members.
- Monitor, capture, and review supply chain performance and cost data.
- Identify and eliminate 'waste' in all its forms from the supply chain.
- Develop a closer working relationship with suppliers by developing an ongoing and open dialogue.
- Use long term projects and framework contracts as the starting point for developing integrated supply chains.

DTI, employer organisations, trade and manufacturing associations and professional institutions

- Support and encourage the industry to improve supply chain and logistics knowledge and performance.
- Agree and implement industry-wide standards and a development strategy for e-trading.
- Ensure professional institutions reflect modern supply chain and logistics practices in their qualification requirements.

Designers

- Involve lead and specialist contractors as early as reasonably practicable in the design process
- Produce timely and accurate design information to support production and health and safety and to minimise waste.
- Ensure designer education and training includes a full understanding of the affects that design can have upon production, supply chain and logistics management.

Software industry

- Software developers should work with the construction industry's organisations to make it possible for the computers of trading partners to pass information back and forth seamlessly (interoperability).

Suppliers and manufacturers

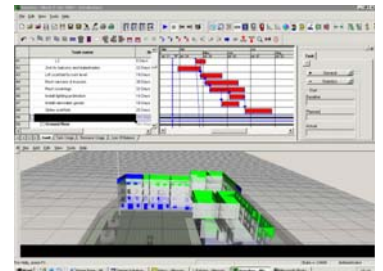
- Invest in e-trading to reduce transaction costs and time.
- Train contractors in effective logistics and production methods.

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Block B of Denne's Ordell Road scheme nearing completion



Screenshot of the Synchro system showing 3D graphics linked to programme

Full project reports and sources of further information

Full Project Reports

www.constructingexcellence.org.uk/resourcecentre/integratedconstruction/projects.isp

CITB-ConstructionSkills

www.citb-constructionskills.co.uk

Constructing Excellence

www.constructingexcellence.org.uk

Strategic Forum

www.strategicforum.org.uk

Lean Construction Institute

www.leanconstruction.org



Interserve Project Services – West Midland's Supply Chain Workshop



Portable bar-code reader

The action learning projects

Logistics at Ordell Road, Denne Construction

Two research projects were carried out with Denne Construction by the Centre for Performance Improvement. The first was in partnership with Synchro and involved the application of the Synchro Logistics Management system. This research project explored the benefits that such a system could provide in terms of aiding the integration of construction supply chains. It also reviewed the barriers that exist in introducing a technically advanced system within the industry.

The second research project examined construction logistics and specifically reviewed the three of the areas highlighted by the Strategic Forum's Construction Logistics Group, namely:

- i) Transport
- ii) Stockholding
- iii) Efficiency of on-site labour.

In both projects the research was undertaken on major residential schemes in East London carried out within a strategic partnering relationship by Denne Construction on behalf of Berkeley Homes.

Supply chain relationships within Framework arrangements, Interserve

The project's aim was to develop and implement a range of innovative approaches to improving framework and project supply chains at the second and third tier levels.

The specific objectives were for the project team to have:

- identified supply chain challenges and improvement opportunities at second and third tier levels
- developed strategies and practical techniques to involve the supply chain in resolving the issues and improving performance
- measured the qualitative and quantitative improvements
- analysed the critical success factors and written these in a form suitable for dissemination to the wider supply chain and industry.

The key participants in the Interserve project include NHS Procure 21, BT Telereal, Department of Work and Pensions (DWP), Somerfield, AMEC, Interserve Project Services, Interserve Health, specialist contractors, and suppliers. Work on some elements has only recently finished and the complete report will be posted shortly.

IT based logistics, Taylor Woodrow

The project focused its activity on synchronising activities and resource flows on the refurbishment of Fort Dunlop and a tunnelling project for the Cross Rail enabling works using logistics software. Further work on the St Helens hospital PFI project is on hold awaiting Treasury financial approval.

The project also investigated the electronic tracking of materials and components in Taylor Woodrow's house building business, led by CITE.

Driving efficiency on a repetitive housing modernisation project, Wates

The project focused on the refurbishment of houses for Whitefriars Housing Group in Coventry. The objective of the project was to test whether using logistics software could improve productivity from its existing high level. The project defined the work process for refurbishing each house.

The project team worked with the client, site team, bathroom suppliers and fitters and the kitchen suppliers. In addition, much time was spent with the teams on the ground to understand the entire process from property release through to survey and completion.

Implementing e-trading throughout the supply chain, CITE

CITE, Construction Industry Trading Electronically, worked with the other project partners to explore the opportunities for implementing e-trading to streamline the administration process in purchasing and supply.

Application of a collaborative logistics planning and project management system, Synchro Limited

The Synchro system was trialled with Denne on the Ordell Road project, with Wates on the Whitefriars refurbishment programme and is currently being applied to the planning phase of a project with Taylor Woodrow which will form the basis for a report in the future.

Three innovations mark out Synchro from traditional approaches to planning. In summary, these are:

- the explicit inclusion of the space as a resource that is made available to different trades in a sequence that reflects ideal workflow requirements
- a collaborative set up in which every supplier is able to refine the way that they propose to work, but which in addition captures the essential reliance each trade has on other suppliers
- the approach to managing risk includes an early warning system and a collaborative approach to seeking a resolution of issues that may impact job completions.