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National Institute for Transport and Logistics

Supply Chain

Perspectives

Value Adding Networks

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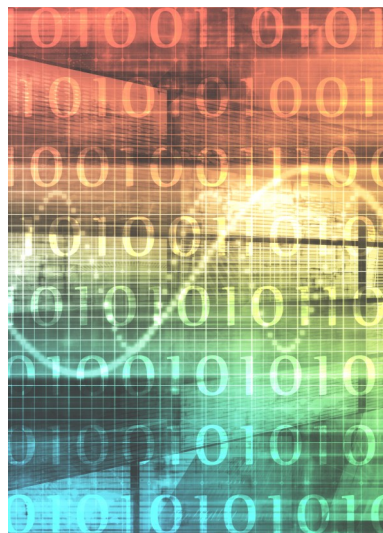
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Editorial

National Institute for Transport and Logistics

Welcome to Issue 2 of *Supply Chain Perspectives*.

The focus of this issue is the concept of supply chain integration (SCI) and value-adding networks, particularly given the current volatility in global markets. Integration has long been central to supply chain management (SCM) thinking. Traditionally, various activities and functions across the supply chain have been measured and managed in isolation and have often operated at cross purposes as a consequence. SCM is about thinking beyond traditional internal and external boundaries and organising activities more holistically so that they work in a more streamlined and integrated manner. NITL has long likened the operation of a supply chain to that of a symphony orchestra. If the various sections of an orchestra were to play in isolation from each other, irrespective of the virtousity of the individual players and section leaders, the result would likely be noise to most ears. However, with the aid of sheet music and a conductor, harmony can be achieved resulting in music to our ears! The sheet music is analogous to the supply chain plan, and the conductor to the supply chain manager. They ensure that the players operate as a team and perform in an *integrated* manner. Like all analogies, this one collapses if we try to extend it too far but we hope that it illustrates the centrality of integration to the SCM concept.

In this issue, we explore various aspects of integration and value-adding networks. The notion of a value chain and its relationship to SCM is explored in the article by Edward Sweeney. The article by John Clarke examines some issues which are specifically concerned with the inventory and warehousing aspect of SCI. It has long been recognized that technology – in particular information and communication technology (ICT) – has a potentially important role to play in achieving higher levels of integration. The article by Zetes looks at this issue with specific reference to the adoption of a pragmatic approach to the implementation of a specific tool (namely RFID). Sercom's article introduces a toolkit for effective supply chain improvement recognizing that integration is often the overriding aim of any such improvement exercise. Finally, the review article by Park and Sweeney, based on John Gattorna's latest book, is concerned with strategic and operational aspects of dynamic supply chain alignment. In many ways, the alignment concept takes integration to a new level and sets the agenda for 21st Century SCM.

Supply Chain Perspectives also includes web reviews and news about NITL and the wider SCM community in Ireland. Of particular note is Logistics Ireland 2009 which will take place at the Crowne Plaza Hotel in Dublin on October 20th. The piece by Pamela O'Brien and Carolyn Collins introduces the event in some detail. We look forward to welcoming you to the event next month.

Your NITL Team

SUPPLY CHAIN MANAGEMENT FORUM
A Review of Developments at NITL and the World of SCM

NITL Launches New Book

The current economic turbulence has thrown into light the absolute global nature of business in today's world. A key part of thriving and surviving on the global stage is the supply chain itself, vital to every business.

Following on from the acclaimed *Perspectives on Supply Chain Management and Logistics, Supply Chain Management and Logistics in a Volatile Global Environment* (ISBN: 978-1-84218-177-5) explores a range of supply chain management (SCM) and logistics challenges in the rapidly evolving global context. The book, edited by Edward Sweeney of NITL and published in September, contains

- Contributed chapters from SCM thought leaders (including Martin Christopher, John Gattorna and David Grant)
- Reflections on specific issues happening across a variety of industries
- Implications of and tactics to deal with critical issues emerging from the SCM research agenda.

Aimed squarely at SCM and logistics professionals, this book will also reach a wider market of students, researchers and policy makers. You can pre-order a copy now at http://www.blackhallpublishing.com.

Supply Chain Management and Logistics in a Volatile Global Environment

edited by
Edward Sweeney
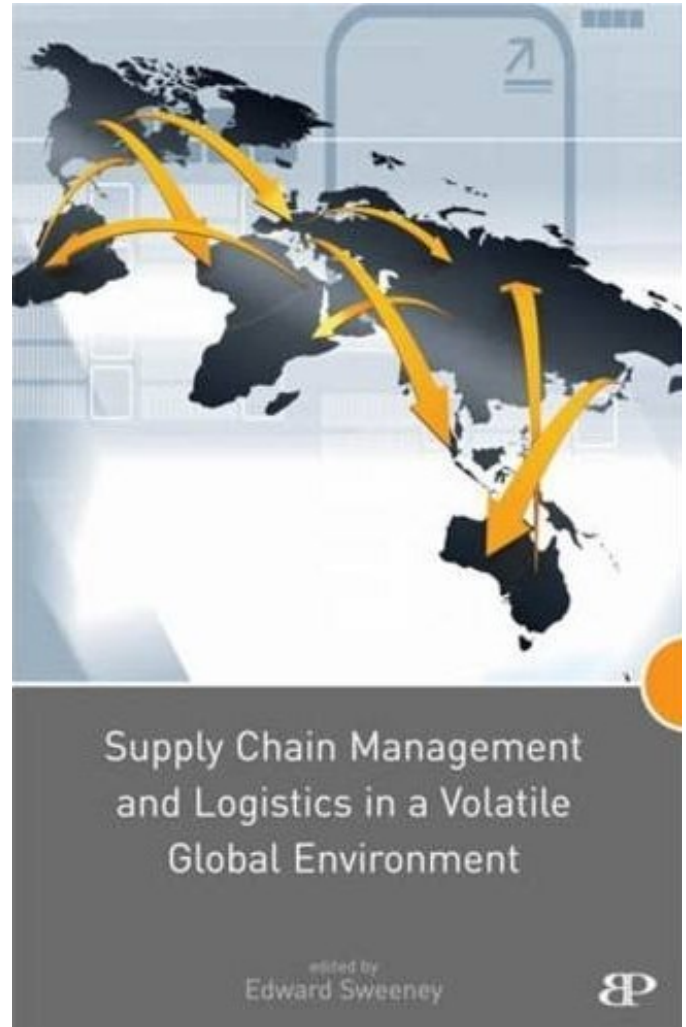
Logistics Ireland 2009
'Supply Chain Management and Logistics in a Volatile Global Economy'
by Pamela O'Brien and Carolyn Collins

Logistics Ireland 2009, Ireland's largest Supply Chain Management conference takes place on Tuesday 20th of October in the Crowne Plaza, Northwood Demesne, Dublin 9. The theme for 2009 is 'Supply Chain Management and Logistics in a Volatile Global Economy'. The precarious nature of the current global business environment has impacted greatly on all aspects of supply chain design and management. The focus of the conference will be on the implementation of practical SCM strategies that give organizations the ability to meet these challenges and to tap into the upturn when it inevitably happens.

The full line up of speakers for Logistics Ireland 2009 has been confirmed. Our first speaker is Professor David Bruce Grant, Director of the prestigious University of Hull Logistics Institute. David will deliver a presentation that provides an overview of the role of logistics and SCM in addressing the challenges presented by the current economic climate. His presentation will focus specifically on the importance of small and medium sized enterprises (SMEs) in leading the way back to economic prosperity.

Professor Grant will be followed Liam Cassidy. Liam is an experienced supply chain professional with a verifiable track record of turning poor performing factories into benchmark sites. Liam's presentation tells the story of the Oral B Iowa City Plant which was preparing for closure in 2000. Then one of the highest cost factories within the world of Gillette, it was transformed within two years to become a 'benchmark' site and had reduced its costs to the point where low cost countries like Mexico and China were eliminated as serious threats to its business.

The third keynote speaker is Declan Kearney, founder and Chief Executive Officer of Supplierforce, a leading Supply Management solution provider. Declan's presentation, entitled "Achieving cost efficiencies and reducing risk exposure through total supply management", will highlight the critical role of supply management within SCM and the importance of dynamic risk management.

Pearce Flannery is the next speaker. Pearce is the founder and Chief Executive Officer of Pragmatica – the management, marketing and human resource consultancy group. His speech will provide an overview of recent developments in the global and domestic economy and will identify some of the characteristics necessary for improvement.

As the final keynote speaker NITL is delighted to welcome back Professor Martin Christopher, Emeritus Professor of Marketing and Logistics at Cranfield University in the UK. Martin is one of the world's leading experts and thought leaders in the logistics and SCM field. His presentation recognises that the recent turbulence in markets around the world has highlighted the interconnectedness of modern global supply chains. It argues that management of the associated complexity requires the development of agile capabilities within the business and across the supply chain.

In addition to the keynote presentations, our Logistics Ireland speakers will form an 'Expert Panel' for a Question and Answer Session to be chaired by Ingrid Miley, Industry and Employment Correspondent for RTE. This session will be opened to the floor and will give delegates the chance to ask the panel for their advice on any SCM issue.

This years conference aims is to highlight the continuing importance of effective SCM practice and its vital role in ensuring the competitiveness of Irish industry in today's global marketplace.

The conference commences at 8.30 a.m. with the opening welcome and Ministerial Address and will be closed by Edward Sweeney at 3.00pm.

Immediately following the conference close, is the official launch the new book *"Supply Chain Management and Logistics in a Volatile Global Environment"* (edited by Edward Sweeney)*.* Both Professor David Grant and Professor Martin Christopher contributed chapters. The book explores a range of SCM and logistics challenges. It also addresses tactics to deal with critical issues emerging from the SCM research agenda. Thus, it is foreseen that this book will greatly benefit students, managers, researchers and policy makers. NITL welcomes all delegates to join us for a glass of wine after lunch to mark the launch of our book.

The delegate fee for Logistics Ireland 2009 is €195 plus VAT. Demand for places is particularly high this year so we suggest booking your place soon.

To book a place at Logistics Ireland 2009 please contact Pamela O'Brien in NITL at Pamela.obrien@dit.ie
Information and booking forms are available to download at http://www.nitl.ie/Logistics_Ireland_2009/Default.255.html

National Institute for Transport and Logistics

Crowne Plaza Hotel
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Tuesday 20th October 2009

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LOGISTICS IRELAND

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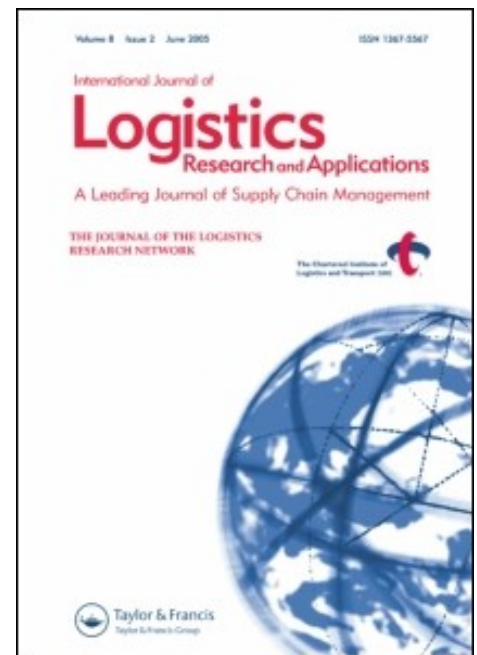SUPPLY CHAIN MANAGEMENT AND LOGISTICS IN A VOLATILE GLOBAL ECONOMY

NITL Staff Member Joins Editorial Board of Leading Journal

Edward Sweeney of NITL was recently invited to join the International Editorial Advisory Board of the *International Journal of Logistics: Research and Applications* (IJLRA). IJLRA is the journal of the Logistics Research Network (LRN) and is published by Taylor and Francis. Leading logistics and supply chain management (SCM) academics from the UK, USA, France, Germany, Italy, Japan, India, China and further afield make up the membership of the Board. IJLRA publishes original and challenging work that has a clear applicability to the business world. As a result the journal concentrates on papers of an academic journal standard but aimed at the practitioner as much as the academic. High quality contributions are therefore welcomed from both academics and professionals working in the field of logistics and SCM. Papers aim to further our understanding of logistics and SCM and make a significant original contribution to knowledge. In this context the term 'logistics' is taken in its broadest context as "the management of processes, flow of materials and associated information along the entire supply chain, from raw materials through to the final user of the product".

For further information about IJLRA visit http://www.tandf.co.uk/journals/titles/13675567.asp.
For further information about the activities of LRN visit http://www.ciltuk.org.uk/pages/lrnetwork.

NITL Launches Executive Masters in the Mid-West

Since its inception over a decade ago, NITL has built partnerships with academic institutions throughout Ireland with a view to making its learning programmes as widely available and accessible as possible.

NITL is delighted to announce its new partnership with Griffith College Limerick (GCL). This will make NITL's flagship Executive Masters in Supply Chain Management available to individuals and companies in Limerick and throughout the mid-west region. It is expected that the first module will run during the 2009/10 academic year. NITL's genuinely modular approach means that programmes and modules are easily transferable without in any way damaging the quality of the learning experience.

Commenting on this new partnership with GCL, Edward Sweeney of NITL stated that: "The recent economic turbulence has hit the mid-west region particularly hard with high profile job losses in Dell and elsewhere. There is a recognised need for individuals with the right experience, knowledge, skills, competencies and qualifications in SCM to ensure that the region benefits from the upturn when it occurs. Making this prestigious programme available in the region provides a welcome boost in this regard". Kevin O'Sullivan, Director of GCL, commented that: "We are delighted with the opportunity to provide NITL's qualifications in the region. The need for highly skilled practitioners and strategists in SCM is more important than ever to ensure the continued viability of existing businesses and to contribute in attracting attract new enterprises to the region".

For further details of the programme visit http://www.nitl.ie or http://www.gcl.ie.

NITL Congratulates Recent Ph.D. Graduate

Edward Sweeney of NITL was a guest at the recent degree conferring ceremony at Heriot-Watt University in Edinburgh. At the ceremony Pietro Evangelista was conferred with a Ph.D. for his thesis entitled 'Dissemination of information and communication technology in supply chain management; the impact on small and medium sized transport and logistics service providers'. His research was supervised by Edward and Professor Alan McKinnon, Director of Heriot-Watt's prestigious Logistics Research Centre. Pietro, a close research collaborator of NITL, is researcher in logistics and SCM at the Italian National Research Council (IRAT-CNR) in Naples. He is business economist by background and his current research focuses on innovation and ICT diffusion in the logistics service industry. He lectures at the Department of Managerial Engineering of the University of Naples *'Federico II'*.

Edward congratulated Pietro on behalf of NITL stated that 'NITL is delighted to be associated with Heriot-Watt's world class logistics and supply chain research activity'. Professor McKinnon commented that 'it was a pleasure to supervise Pietro's doctoral research and made all the more enjoyable with Ed's support. The final product was well received by the examiners and reflects very well on Pietro'.

Prof. Alan McKinnon, Dr. Pietro Evangelista and Edward Sweeney.

NITL is New Member of the "Open ENLoCC" (European Network of Logistics Competence Centres) Network

NITL has been invited to become a member of the "Open EN-LoCC" (European Network of Logistics Competence Centres) network, which is a consortium of regional logistics centres of excellence in Europe. The aim of this network is to increase Inter-European cooperation of logistics institutes and organisations – in industry and science - by sharing experience and by working together on common logistics projects. The network aspires to develop innovative systems and technologies in transport and logistics, as well as to advance regional economies by solving infrastructural, organisational and technological problems of logistics and transport. On a European policy level, the network's purpose is to contribute to European harmonisation of law, technology and standardisation in transport and logistics and to support the foundation of new regional logistics competence centres (LoCCs).

The members of ENLoCC currently promote the development of three major topics in the field of logistics:

- LOGPLAT
- LOGtraining
- LOGTEN-T

LOGPLAT is a communication and information tool for selected groups of players in transport logistics, supporting sustainable regional development and, wherever possible, intermodality. It consists of information provided by project and network partners, and interfaces or links to external IT-solutions/sources of information. Its primary function is pooling and categorisation of information to give the user a fast access to latest information and tools, as well as to present the users own information in an organised way.

LOGTRAINING is developing an interregional concept of education in transport logistics. Existing facilities, the newest technologies and theoretical approaches are going to be integrated. Also experts and facilities from the other partner regions will be incorporated. The possibility of training periods, fieldtrips and exchange programs will guarantee a European oriented education.

Within **LOGTEN-T**, Open ENLoCC members cooperate on questions regarding freight transport along the main European transport corridors. So far, the main emphasis regarding these corridors has been given to (fast) passenger transport. However, freight transport should be given equal importance in future.

Open ENLoCC currently has members from the Czech Republic, Austria, Finland, Italy, France, Germany, Poland, Hungary, Sweden and Slovenia. NITL is its first Irish partner.

For more information, please visit
http://www.openenlocc.net

NITL at Logistics Research Network Annual Conference 2009

Some of NITL's academic staff recently attended the annual conference of the Logistics Research Network (LRN), which was held at the Cardiff University Business School. LRN is a special interest group of the Chartered Institute of Logistics and Transport (CILT – UK) which brings together academics and practitioners in the fields of logistics and supply chain management (SCM). Its annual conference is a major event and provides participants with a forum for the discussion of the latest thinking in the area. NITL has long been active in the LRN and hosted the annual conference in 2004.

The theme of the conference was 'Volatile and Fragile Supply Chains'. This theme recognises the key role of logistics and SCM in today's volatile economic environment. NITL was represented at the conference by Edward Sweeney, Claudia Wagner and Antonino Raspagliesi (a visiting scholar from Politecnico di Milano).

The two papers presented by NITL staff were:

ICT adoption and impact on the Italian logistics service providers' performance by Pietro Evangelista, Riccardo Mogre, Alessandro Perego, Antonino Raspagliesi and Edward Sweeney; and

An analysis of freight logistics requirements for the island of Ireland by Claudia Wagner, Edward Sweeney, Colm Ryan and Pietro Evangelista.

The former was based on NITL's ongoing collaborative research with its partners in Italy and the UK. The latter was based on the work NITL conducted as part of a consortium funded by Inter*Trade*Ireland on future freight transport requirements.

Further information about the event is available at www.lrn2009.org.uk.
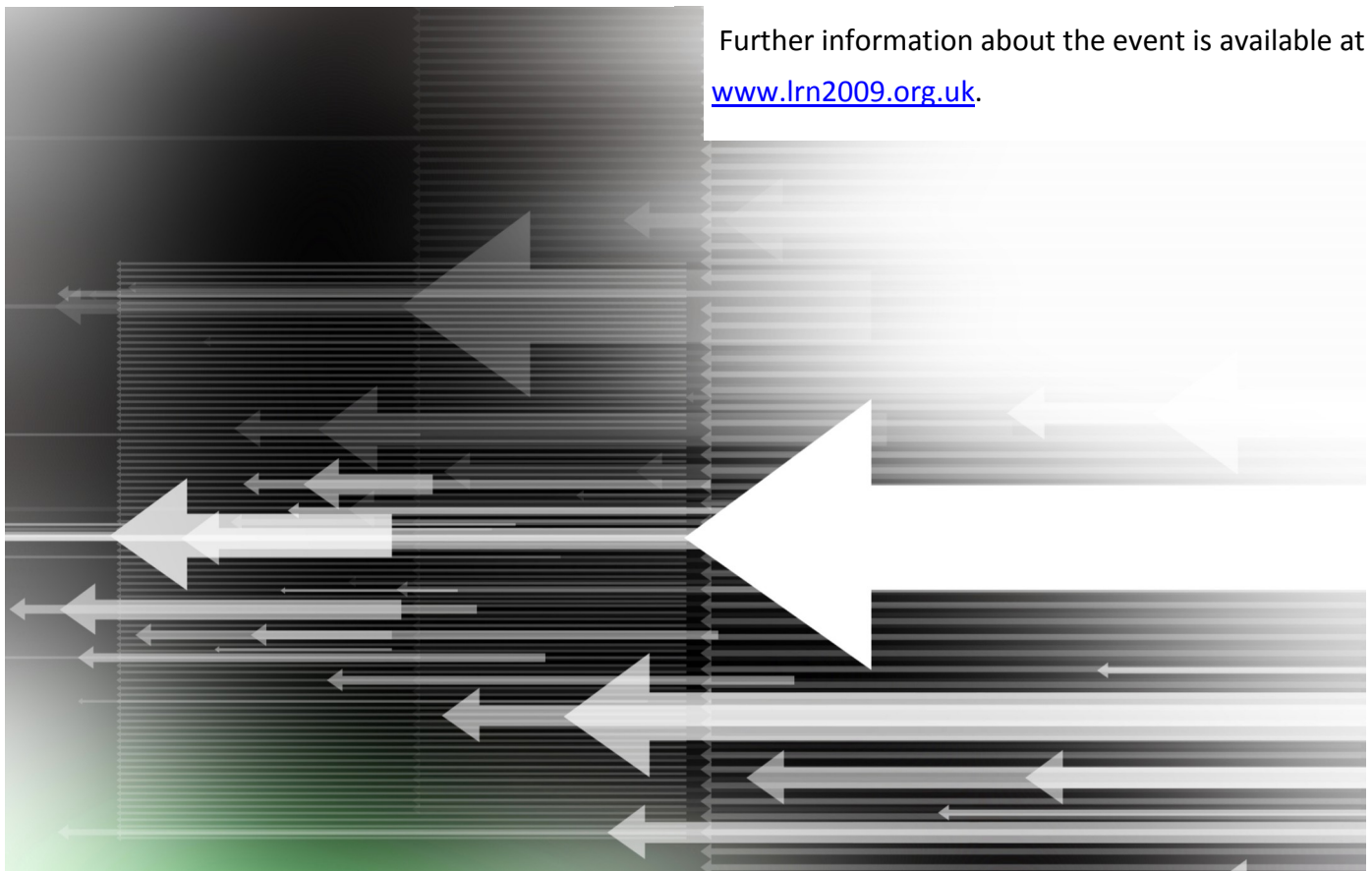
USEFUL WEBSITES
By Erica Staller

Supply Chain Digest— www.scdigest.com

Supply Chain Digest is an online weekly newsletter. It is designed to synthesize and condense important SCM news, provide insight and put news in context. The newsletter and website also feature commentary on current issues, blogs by industry professionals, videocasts, case studies, white papers and a question and answer section. Th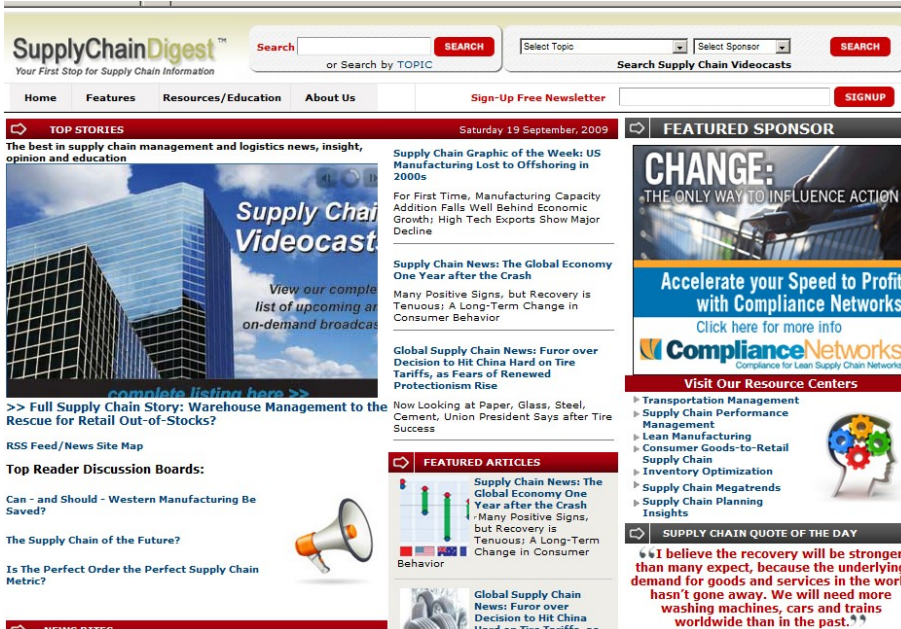e articles, opinion pieces and blogs are well researched and germane. The "News Bites" section covers useful industry statistics, trivia and stock prices.

The home page is a bit busy, but the website is easy to get around otherwise. However, in order to access certain areas of the website you must register for the *Supply Chain Digest* newsletter, which is free.

Logistics Management — www.logisticsmgmt.com

Logistics Management is intended to serve logistics professionals, providing them with information about the role of logistics today, transportation and emerging technology. The magazine includes industry news, columns written by credible professionals, current trends and informative articles with relevant topics. The website provides access to archived articles, eNewsletters on a variety of topics, videos, access to white papers, webcasts and information on industry leaders.

Logistics Management is also now part of the Supply Chain Group, so there are links to other useful supply chain websites, such as the *Supply Chain Management Review*, *Modern Materials Handling*, and *Material Handling Product News*. You may subscribe to the digital edition of *Logistics Management* free of charge.

Erica Staller is based at Arizona State University and is a former visiting researcher at NITL.

Supply Chain Management and the Value Chain
by Edward Sweeney

One well-known approach to strategic thinking and strategy formulation, based on the concept of the value chain, was introduced a quarter of a century ago by Professor Michael Porter of Harvard Business School (Porter 1985). The idea of the value chain is based on the process view of organisations, the idea of seeing a manufacturing (or service) organisation as a system, made up of subsystems each with inputs, transformation processes and outputs. Inputs, transformation processes and outputs involve the acquisition and consumption of resources, such as money, labour, materials, equipment, buildings, land, administration and management. How value chain activities are carried out determines costs and affects profits.

Most organisations engage in hundreds, even thousands, of activities in the process of converting inputs to outputs. These activities can be classified generally as either primary or support activities that all businesses must undertake in some form. According to Porter (1985), the *primary* activities are:

1. **Inbound Logistics**, which involve relationships with suppliers and include all the activities required to receive, store and disseminate inputs.
2. **Operations** are all the activities required to transform inputs into outputs (products and services).
3. **Outbound Logistics**, which involve relationships with customers and include all the activities required to collect, store and distribute the output.
4. **Marketing and Sales** are activities that inform buyers about products and services, induce buyers to purchase them and facilitate their purchase.
5. **Service** includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

The *support* activities are procurement, human resource management (HRM), technological development and infrastructure. A graphical representation of Porter's value chain is shown in Figure 1 below.
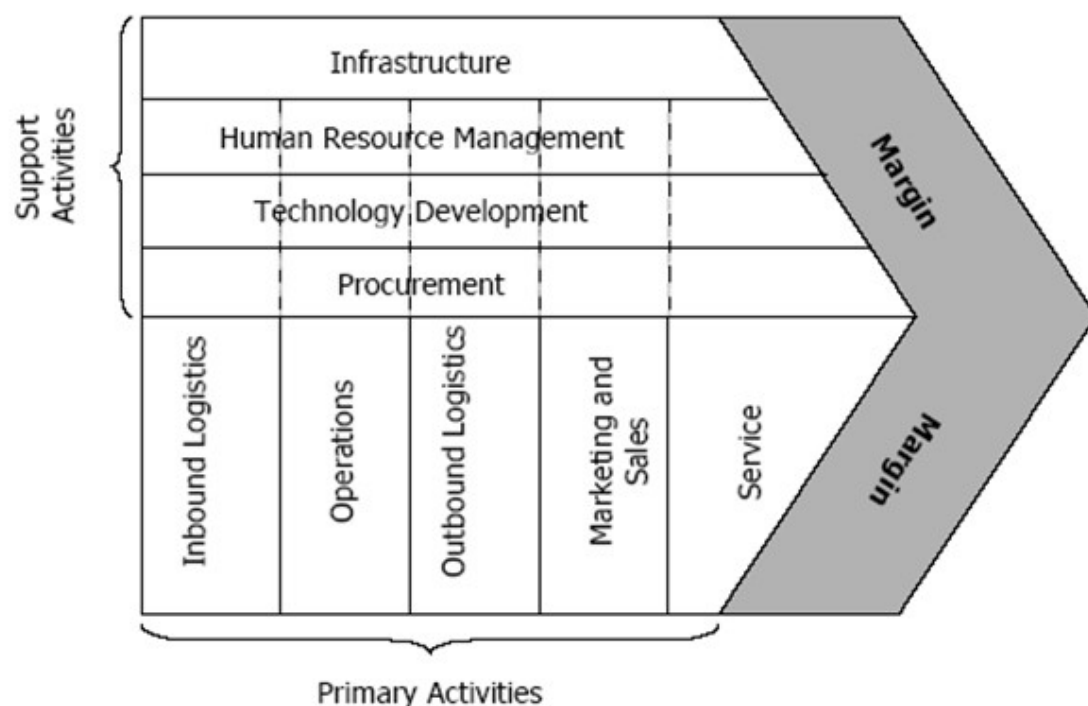

Figure 1: Porter's Value Chain (Porter, 1985)

Jacobs (2003) notes that:

> The value chain disaggregates a firm into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation. A firm gains competitive advantage by performing these strategically important activities more cheaply or better than its competitors.

One implication of Porter's thesis is that firms need to examine each activity in their value chains to determine whether or not they have a real competitive advantage in the activity. One consequence of this is that activities which are not a source of real competitive advantage are often being outsourced thus creating more virtual supply chain architectures. This is in line with the strategic focus within firms on the identification of - and concentration on - 'core competencies'.

Oates (1998) defines core competencies as 'the central things that organisations do well'. The corollary of this is that activities regarded as 'non-core' are often being outsourced. Greaver (1999) states that 'non-core competencies take up time, energy and workspace, and help management lose sight of what is important in an organisation'. Furthermore, the trend towards economic and business globalisation has facilitated the outsourcing of various activities to overseas locations (offshoring). This is particularly the case in relation to the off-shoring of relatively labour-intensive activities to lower labour cost locations. In short, key supply chain activities are increasingly being outsourced to third-party organisations.

The relationship between this chain and SCM has been the subject of discussion in several academic papers (e.g. Barney 1997; Lazzarini et al. 2001). Supply chains are in essence sets of activities representing successive stages of value creation. Supply chain management (SCM) is, therefore, concerned with the management of these activities in a holistic manner. The literature on SCM suggests that vertical interdependencies between the activities require a systemic approach to the management of material and information flows between firms engaged in the chain. On the other hand, Porter's original value chain analysis was primarily an approach that described a set of sequential activities creating value *within* firms.

However, outsourcing of supply chain functionality and the resulting creation of more virtual configurations has had the effect of extending the value chain beyond the boundaries of individual firms. As noted by Christopher (2005), 'the supply chain becomes the value chain'. In other words, the distinction often traditionally espoused between the *value chain* and the *supply chain* has become inconsequential. As succinctly suggested by Christopher (2005):

> Now the focus has widened as the move to outsourcing non-core activities in the value chain accelerates. Thus, we are seeing, in effect, the supply chain become the value chain.

In conclusion, it is important that firms:

1. Identify those activities in the supply (i.e. value) chain that are sources of real competitive advantage;
2. Decide which activities are best carried out in-house and which should be outsourced to third parties; and
3. Manage the in-house and outsourced elements of the supply (i.e. value) chain in an integrated and holistic manner in line with the principles of SCM.

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OEM inventory hasn't reduced, The Warehouse Just Got BIGGER

by John Clarke

Introduction

The profiles of OEM companies have changed considerably over the last decade, transforming from an in-house manufacturing to an outsourced manufacturing model resulting in a significant change in the way inventory is owned and managed.

There are numerous trends and initiatives helping OEM's to keep their key inventory metrics looking very lean, the latest being VMI (vendor managed inventory). However, all is not as it seems: The inventory still exists, it is just not being held by the OEM, but in various locations in their upstream supply chain. This "hidden" inventory determines the OEM's ability to respond and is also a key measure of financial risk in their supply chain.

US companies are required to disclose "Purchase Obligations" (commitments to upstream inventory) in year-end accounts because they are of critical importance to the liquidity of a business (SOX); however companies outside of the US are not obliged to make any declaration in this regard.

The title of this article reflects that while materials may be held in different locations by different companies, the bulk of the ownership belongs to the same entity as it did a decade ago. However, the warehouse has grown so big that you cannot easily identify "your" inventory in it.

Traditional versus Modern Supply Chains

To explain how supply chains have progressed over the years it is necessary to first describe in simple terms what traditional in-house manufacturing looks like. The two diagrams Figure 1 & Figure 2 provide a simple overview of the differences between in-house & outsourced manufacture from an inventory perspective.

Traditional in-house supply chain

Figure 1 below outlines a traditional in-house manufacturing model. All value-add stays within one facility. The orange lines signify component supply from outside the facility.
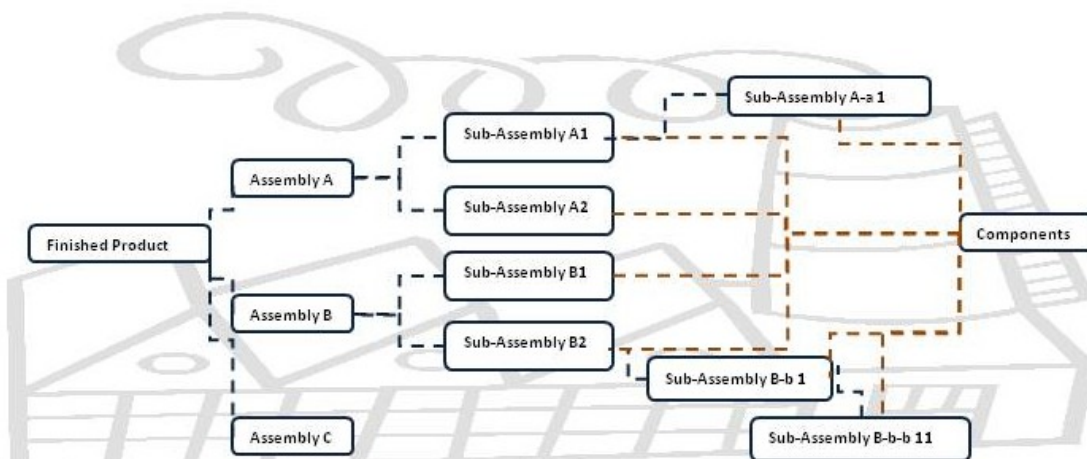

Figure 1: Traditional In-House Manufacturing

Key inventory characteristics for in-house manufacturing are:

- Primarily raw material purchases;
- Value add operations internal;
- Complete inventory visibility & ownership;
- Purchase obligations at lowest value & mainly cancellable;
- Full control on scheduling & resources;
- Always top priority;
- Excellent ERP/MRP tools.

Modern Outsourced Supply Chain

A typical modern outsourced organisation is one in which, at its extreme, the minimum amount of non-core activity gets performed on the OEM's customer facility. Figure 2 represents an outsourced manufacturing model. All value-add outside the OEM facility are at various locations in the supply chain. Red lines signify component/assembly supply from outside the OEM facility.

Key inventory characteristics for an outsourced manufacturing model are:

- Primarily high value assemblies/products purchased;
- Value add operations external;
- Poor supply chain inventory visibility & ownership;
- Purchase obligations at highest value & not cancellable;
- Little control on assembly resources;
- Little control on scheduling;
- Not always top priority, one of many OEM customers;
- Same ERP/MRP tools are not effective for outsourced manufacture.

The key primary differences relate to ownership control and visibility of inventory and the timing of adding value to inventory.

Where is the Inventory?

From the description of the traditional and modern supply chains in the previous sections it is clear to see that the inventory has obviously not vanished, it has just become more difficult to see where it is. From the sce-nario in figure 2, it would be reasonable to assume that ownership lies where inventory lies, but this is where outsourced supply chain models become a bit more complicated.

In the traditional model, everything was under the same roof and full responsibility lay with the operations group of the OEM who generated the plans, purchased and held the inventory and initiated the value add processes (although we could also conclude that the sales department could share the responsibility here).

In the outsourced model the inventory is spread throughout the supply chain in a variety of different locations, recorded on different systems and managed by different people/companies. *Most importantly* as material moves up the supply chain it transforms from a standard part to a customised part/assembly suitable for *only one customer*, the OEM, who must assume ownership of the inventory at various stages in the outsourced supply chain.
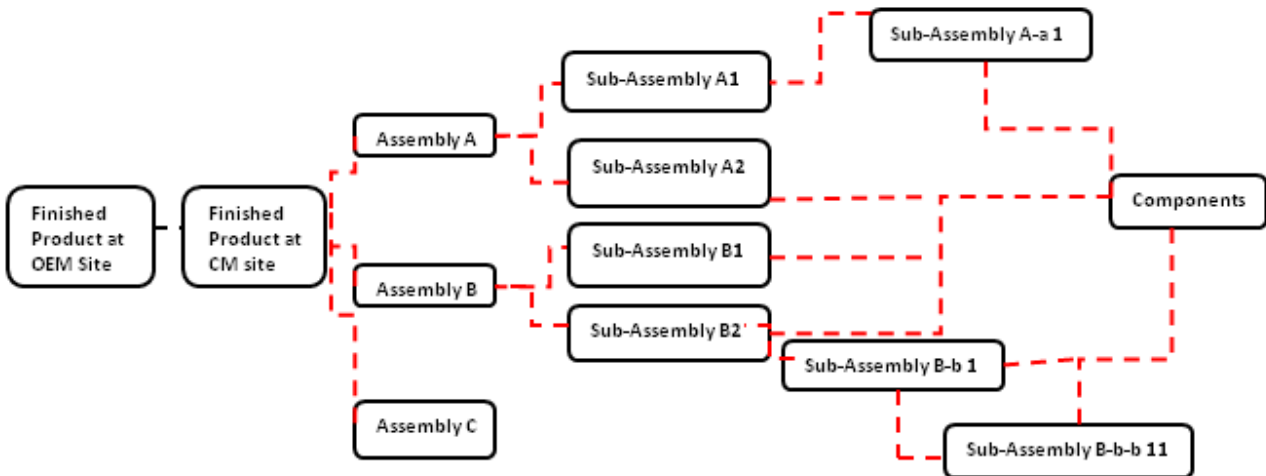

Figure 2: Outsourced Manufacturing

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Interestingly, as current accounting practises do not accommodate recording purchase obligations (inventory only included after invoice) in year-end accounts they do not appear on company financial records even though it can have a significant impact on the liquidity of a business.

The magnitude of this outsourced inventory is such that Sarbanes Oxley have mandated that it be expressed in the year end notes and is defined as "Purchase Obligations", but this only applies to companies quoted on US stock exchanges not companies outside of the US.

An analysis performed on over 100 companies in the hi-tech sector shows that the reported figure of purchase obligations is typically around 13% of cost of sales. This is a significant amount of "committed to, non cancellable inventory" which is outside normal accounting rules.

The fact that US companies are reporting this detail means that they recognise their obligations and ownership commitment to these inventory liabilities. This fact enables us to conclude that the inventory has not vanished, in fact it is still there, it is committed to and OEM's are legally obliged to honour their commitments.

Not only has the inventory not vanished, but it is being held at numerous supply chain locations and at individually higher values than in the traditional method. In the traditional method, MRP systems enabled the OEM to place orders for individual items in accordance with their lead-times only creating a liability for the individual items.

In the current outsourced model this functionality is not available in MRP systems because they do not span different companies. This means that each autonomous company places orders for high value purchased assemblies, for a duration equal to the cumulative lead-time, rather than just ordering the individual item as in the traditional model.

Essentially this means that the total value of commitments throughout an outsourced supply chain can be significantly greater than the sum of individual commitments within an in-house operation. The graph in Figure 3 below shows how the purchase obligations for both traditional and outsourced models would look as a result of the outsourced model holding higher value orders open for longer periods.
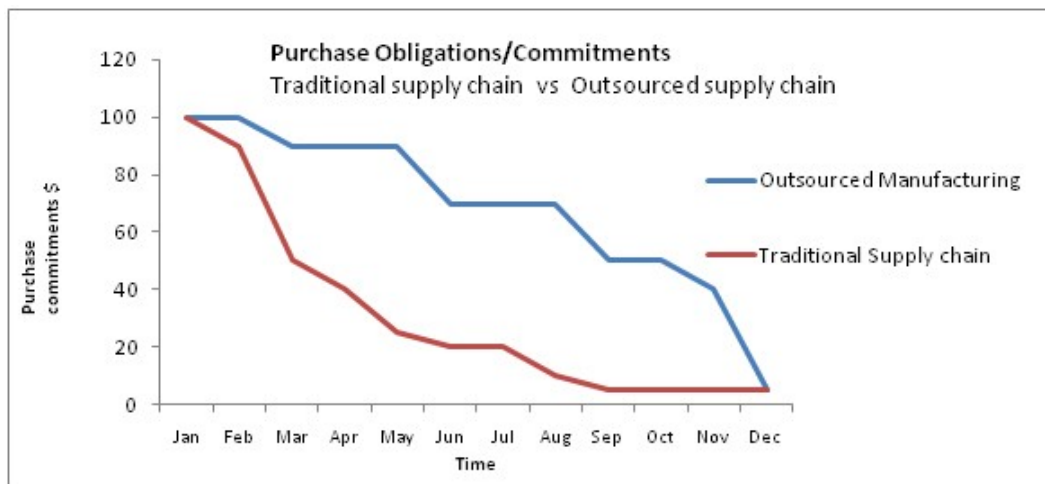

Figure 3: Purchase Obligations in an Outsourced and In-House Manufacturing Model

What are the risks involved and what can be done to improve the situation?

All products have lead-times and assembly sequences; everything cannot be manufactured simultaneously; components are required for sub-assemblies; sub-assemblies are required for assemblies, assemblies for products and so on. There is a logical order in which products get built and this is determined and described by the bill of materials design structure.

Typically OEM's of complex electronic equipment require very quick response times, ranging from days to one or two weeks at the most, driven entirely by their customers' demands. In an outsourced model the supply chain is dispersed and OEM's are forced to provide contracts or commitments outside the normal ordering process to ensure quick response times because of one simple parameter, *Lead-Times*.

The risks involved are substantial, as mentioned in the previous section, with these types of commitments being 13% of cost of sales. This is a huge figure which is not reported in normal accounting practises.

Purchase obligations are defined by Sarbanes Oxley as *"an agreement to purchase goods or services that is enforceable and legally binding on the company that specifies all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum or variable price provisions; and the approximate timing of the transaction and are of critical importance to the liquidity of a business"*.

One of the main issues with this type of inventory is that it is not recorded on one single IT system and hence requires extensive manual input to provide a reasonably accurate assessment of the inventory in the complete upstream supply chain. As orders must pass from one supplier to another an "In-series" chain of or-

ders is created, which is shown in figure 4 below. Solid lines represent order flow, dashed lines represent the materials flow.

The primary drawback with IT systems for this type of outsourced manufacture is that to create a demand at the Sub-assembly (A-a-1 level for example), there has to be a series of orders issued as follows; OEM to the CM, CM to the supplier of Assembly A, to the supplier of Sub-Assembly A1 and finally to the supplier of Sub-Assembly A-a-1. This means that there has to be either (A) four purchase orders issued throughout the complete supply chain, or (B) the OEM creates a manual short-circuit and issues a commitment/obligation directly to the supplier of A-a-1.

Either method, A or B are a significant step backward from the excellent MRP tools that were so successful at managing the inventory for an in-house model.
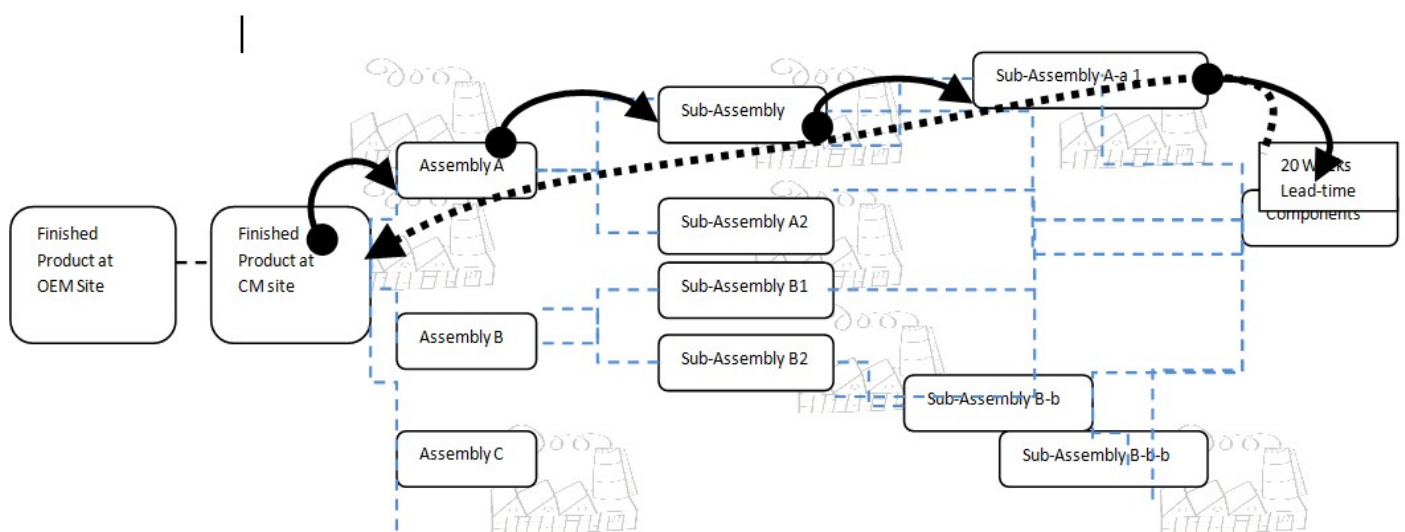

Figure 4: Demand relationships on components required for sub- assembly A-a-1

Taking an example of a long lead-time component which is used to manufacture assembly A-a-1, let us say 20 weeks for one particular component, and that there are two weeks for each additional subsequent manufacturing step to completed product. If the OEM simply uses their MRP system with no manual planning, this would mean that they would have to place an order with their CM for the full value of the product 28 weeks in advance.

The choice of action is not ideal for operations personnel, they can either:

(A)   Order the complete product far in advance but on the IT system and manageable, or

(B)   Manually commit and have much less exposure but no visibility on IT/ accountancy systems.

Even with the manual planning, the whole supply chain must be completely in the loop and aware which parts the OEM has committed to manually and which are not. A nightmare scenario.

Conclusion

This article set out to examine the inventory ownership, liabilities commitments and responsiveness at all levels in the inbound supply-chain of a modern outsourced OEM. Our conclusions are based upon the analysis of year end accounts (10-K filings) on over 100 high technology NYSE listed companies, which is summarised below:

"Purchase Obligations" which are also known as upstream inventory represent a significant 13% of cost of sales and with the exception of US companies, this data is not reported in year end accounts. With values this magnitude, all companies should be closely monitoring this liability on a formal basis.

"Cash and equivalent reserves" are only 3.5 times the value of purchase obligations. This level of "committed-to liability" can have a serious affect on the liquidity of a business and poses a major risk for OEM's.

"Days purchase commitments outstanding" (DPCO™) represent 50 days. Many companies are quoting days inventory outstanding (DIO) based upon inventory on their books (industry norms around 40 days for complex electrical equipment. The reality is that due to long lead-times the true inventory days should also include some portion of DPCO™ to realistic represent responsiveness and overall commitment to inventory.

There is a lot of scope for IT tools to improve this situation, traditional systems worked excellently in traditional manufacturing models, and they just need to be enhanced to operate in the real world of complex global supply chains.

Supply chain managers wishing to reduce their purchase obligations should above all concentrate on how the product is structured at the design stage, because it is at this stage that the manufacturing sequence is designed visa via the bill of materials (BOM) structure. BOM are structured to reflect how a product should be manufactured, careful attention should also be paid in structuring them to satisfy the requirements of an outsourced environment. A well designed BOM placing emphasis on cumulative lead-times and the positioning of long-lead-time components in the overall BOM structure can provide significant reduction in supply chain inventories.

To conclude, any OEM with outsourced manufacturing has a much smaller warehouse on their premises, but a much larger one in numerous locations, managed by different organisations, and different systems. The challenge is to **manage them carefully!**

A Pragmatic Approach to RFID -
5 Business Cases Delivering the Best Return on Investment

Growing interest from the market for RFID...

RFID or, in other words, the use of radio frequency tags for identification, tracking and tracing purposes, is all around us. It is being used, for example, for the identification of pets, the payment of road tolls, access control in train stations, quality control of food products and many other applications. Although the technology behind RFID has reached maturity in a number of applications, it has been largely overhyped over the last few years. Many integrators felt the pressure to offer RFID solutions, but the high expectations raised have never really been met.

The main reason for this is that with RFID, the possibilities for applications are endless. Depending on the type of radio frequency and tag used, the capabilities of each RFID solution can vary significantly in terms of reading distance, type and amount of information stored, or cost of implementation. Nevertheless, when choosing the right material and approach for an RFID application, important benefits can be realised in terms of traceability and efficiency. Today, a growing number of solution providers are focusing on niche markets in which the requirements and benefits can be more easily defined for RFID. Furthermore, now that the technology is becoming mature in various niches and proving its worth, RFID is once again on the radar, amongst other technologies in supply chain environments.

...but no real breakthrough yet

So RFID is making headway, but has not as yet made any real breakthrough in the supply chain. Many companies are still reluctant to introduce RFID into their processes. This is for several reasons. A survey on RFID conducted by Zetes revealed that although most companies seem to understand where the most important benefits can be found (traceability, process automation and improved accuracy), they are still not convinced of its need, with cost remaining the main obstacle for implementation. Indeed, even if the possibilities offered by RFID are very wide, a tag often appears to be very pricey in comparison to the product that has to be traced or identified.

Some companies, whilst conscious of the advantages and possibilities of RFID, are only considering it as a means of enhancing information exchange with their suppliers or clients. In these particular cases, RFID suffers from the fact that it is not yet a widespread technology. This is, or has been, the case with many other upcoming technologies. For example, when the first fax machines appeared on the market, what was the use of having one if most of your contacts were not users? We are now seeing some large retailers trying out RFID technology and asking their providers to do likewise. Others will follow. But, for early adopters, it always requires time to establish the return on investment (ROI).
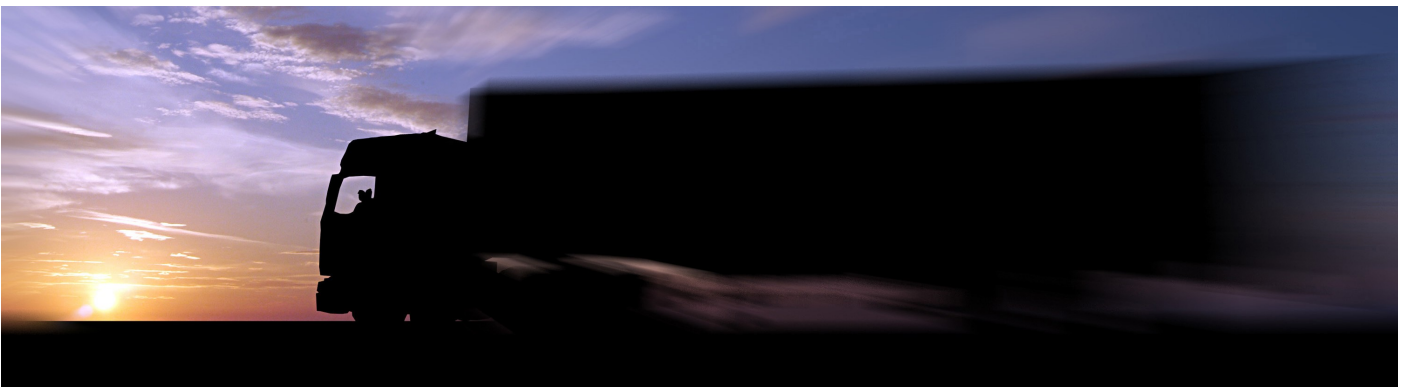
Unsurprisingly, 12% of respondents to Zetes' survey declared that they were interested in RFID but were still waiting for a convincing business case. So they are attentive to developments in the field and waiting eagerly to see what RFID could do for them.

RFID delivers ROI! 5 business cases that offer a clear illustration

To assist with developing this understanding of the benefits, Zetes has identified 5 business cases where the implementation of RFID is demonstrating a significant return on investment.

1) The Case for Tracking Returnable Assets

For many companies, the loss of returnable assets (pallets, roll cages, plastic crates, etc.) represents a huge waste of money. By identifying them with an RFID tag, they are able to trace and manage them more efficiently, knowing exactly which asset has been sent to which customer, how many they should still have on site, etc. The tags on items leaving or entering stores are read automatically whenever a truck is being loaded or unloaded. The ROI for such applications is quite obvious, as the use of RFID helps companies to avoid losing thousands of items each year, worth up to 400€ for a roll cage.

2) The Case for Distribution Centres - Pallet loading and unloading

RFID can reduce the time required to load or unload trucks. Today, most companies still use barcodes for these tasks and each item (e.g. carton boxes on a pallet) has to be scanned individually. By using RFID to identify the transported goods and installing an RFID gate at the loading and/or unloading gate, information can be read automatically when entering or leaving distribution centres. But not only does it allow a time saving, thanks to RFID, the error rate is also significantly reduced: products loaded onto the wrong truck or wrong products being unloaded can be detected immediately. Here again, the ROI is quite obvious, as the handling of goods being delivered incorrectly or inappropriately (use of transportation, manpower, etc.) is high and reduces the margin companies earn on their sales. Last but not least, the use of RFID for these tasks also implies higher security for work floor operators, who no longer need to execute potentially dangerous movements using a handheld scanner to scan every single barcode on a product pallet.

3) The Case for Asset Management

For many organisations it is important to know the exact location of their assets, such as electronic apparatus, furniture, etc. and how they are being used. Tagging these assets allows them to better manage these goods "in the field" and to reduce their stock. In hospitals, for example, medical staff can lose precious time searching for a machine that might be in use on another floor. Or sometimes unnecessarily expensive machines are purchased when it should be possible to work efficiently with fewer. Using RFID for asset management also makes it possible to store information about the maintenance of a machine more conveniently, on the machine itself, instead of in a computer programme or even a paper file. Finally, through using RFID, the inventory management of these assets is simplified.

4) In-store inventory

Many stores are loosing a lot of time doing their inventory, counting each item in their stock manually. To do this inventory checking, they often need to close their shop for one or two days and the risk of making errors while counting is high. Using RFID can help to make this tedious task much quicker and easier. Of course, to get the necessary Return On Investment, this can only apply to items where the value justifies the use of an RFID tag, as it might be the case for clothes, electronic apparatus, etc. Not only is the inventory going much faster but the information on the counted items is transmitted directly to the central system and with much greater accuracy. This RFID application also enables stores to identify more quickly which items are out of stock and must be refilled.

5) Food traceability

In the fresh food industry, the use of an active RFID tag makes it possible to check if the cold chain has been respected adequately throughout the supply chain. A sensor placed on each box of perishable food makes it easy to identify exactly which boxes have been affected by a temperature problem and have to be refused, without necessarily rejecting a complete shipment. The same kind of application can be used in the blood transfusion chain, where temperature can be controlled together with the contents of a bag and its location.

What will turn an RFID project into a commercial success?

The business cases described above are, according to Zetes, those that will generate the best return on investment. However, to make an RFID project successful, many other parameters should be taken into account.

Understand the capabilities of the technology and adopt a pragmatic approach

In the past, too many companies were implementing RFID for technology's sake, without understanding or establishing a valid business case to support their investment decisions. In these instances, the cost often tends to be an issue with the price of a tag being too high in comparison to the price of the product to be identified or traced. This makes the use of RFID completely irrelevant. Another common problem can be the nature of the task to be accomplished. Even if RFID opens the door to creativity, for certain processes, the implementation might be more complicated than with another kind of technology. Finally, environmental considerations need to be taken into account. As RFID works using radio frequencies, some materials or other elements in the working environment might hinder the transmission of information. Therefore, RFID is not necessarily the best fit technology to answer the needs of a company. For some projects, they might be better off using voice recognition or barcodes to achieve better results at a lower price.

Anticipation of possible noise & data qualification

As RFID is a technology based on radio frequency, it is necessary to take a certain number of criteria into account when implementing a solution. Identifying the factors that could possibly result in noise and disturb the transmission of information is crucial, as in some cases, this could make the implementation of RFID impossible.

Also, a company that decides to implement RFID for one or several processes needs to define very clearly which information should be read from each tag. Indeed, it is possible that a warehouse operator is wearing clothes that contain an RFID tag, and this would be information the company is definitely not interested in. Therefore, the tasks that correspond to operational processes to be enhanced should be defined clearly. These parameters combined which help collect the relevant information are known as "data qualification".
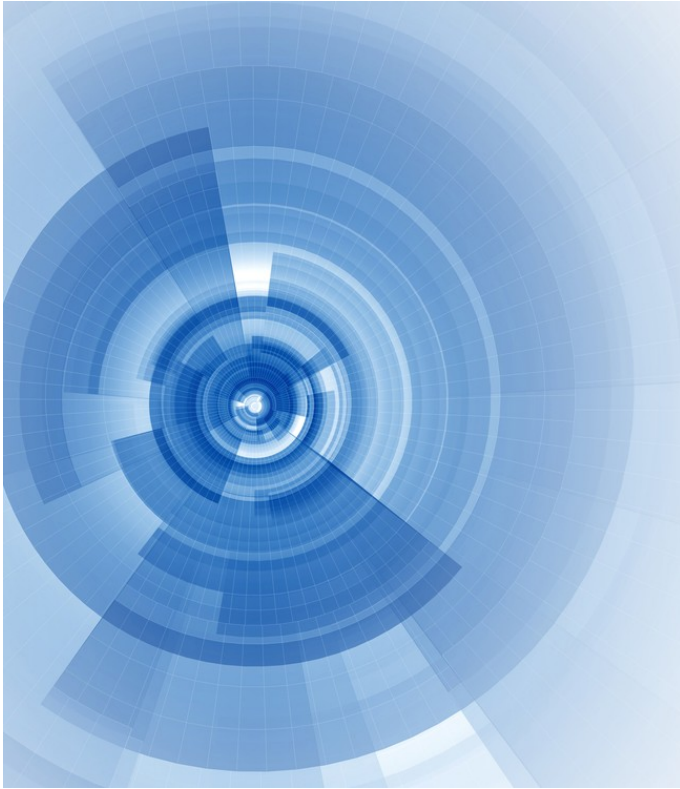
Get the most out of your solution

One of the advantages of RFID is that it does not directly require a large scale implementation. Contrary to what one might generally think, the implementation of RFID does not need to affect all products or processes at a time. The roll-out can occur workflow by workflow, SKU by SKU, supplier by supplier and customer by customer, without necessarily creating a "Big Bang". Even if initially intended to work in a closed loop, if designed properly, an RFID solution can eventually also work in an open loop environment, making all or part of the information transmitted accessible to third parties. The EPCIS standard ratified in 2007 plays an important role in this regard. EPCIS defines a standard set of methods by which EPC data from RFID or other sensor technology can be captured, processed, formatted, and shared. It can accommodate applications as varied as the ones previously described and is very impactful because it allows trading partners to seamlessly and securely share real-time supply chain data with each other. It is in this data sharing that the true potential of RFID-enabled supply chain visibility lies.

Conclusion

RFID should be seen as a "new" technology that enables new solutions and opens the doors to creativity. However, it should not be considered a panacea, capable of solving every tracking or location problem. Although new applications have been made possible thanks to RFID, this technology is not always the one to deliver the best results or return on investment. It is therefore necessary to adopt a pragmatic approach and entrust a business consultant to conduct an in-depth analysis of the environment, needs and strategic objectives in order to determine whether RFID is the best means to optimise a company's business processes.

Additionally, RFID is often most efficiently used when combined with other technologies. In this way, it can then become a route to completing and enhancing an existing solution.
Contrary to what one might think, the implementation of RFID does not trigger a revolution of all operational processes - it can be integrated very smoothly into existing ones and work in parallel with other solutions.

Finally, when implementing RFID, companies should consider future developments. On the one hand, they should explore how the solution might evolve inside the company, leaving the possibility of widening the scope of implementation. On the other hand, they should also take into account the fact that RFID is a technology that is constantly evolving, with new products being launched every month. It is therefore necessary to select an open tool for integration that will not force the re-thinking of their whole solution once a new and better product becomes available.

For more information contact info@uk.zetes.com.

New Supply Chain Toolkit for Optimizing ad-hoc Materials Spend

SerCom Solutions, the supply chain services specialist, has launched a new supply chain toolkit to help companies more effectively manage ad-hoc materials spend. Case evidence from SerCom Solutions has revealed that spending improvements up to 32 per cent are achievable within some commodities using the toolkit.

The new service is designed to overcome many of the procurement difficulties companies encounter when trying to carry out ad-hoc/once-off orders, such as sporadic re-work packaging, product bundling for promotional marketing campaigns and the inclusion of non-standard components or accessories to meet end customer needs.

Supporting such ad-hoc materials spend places significant pressures on procurement teams to source, price and purchase un-forecasted or partially forecasted requirements in extremely short timeframes. On a global scale, this challenge becomes even greater as these activities are happening in multiple geographies with different supply bases and constraints. Such pressures can often lead to less than optimal buying and inefficient procurement.

SerCom's new toolkit and process, is specifically designed to overcome many of the inefficiencies that can arise when dealing with such materials requests. Providing an online project management tool, the system has been developed to specifically support companies with a set of processes to more effectively manage such ad-hoc materials spend.

Commenting on the new supply chain toolkit, Rose McCarthy, Supply Chain Director at SerCom Solutions said: "Taking data feeds regularly from all of the customer regions into our Data Mining tools, our analysts can get to work on customer data and transform ad-hoc activity into definable books-of-business. These activities trigger cost improvement projects by concentrating on extracting business from the data that can be tendered in a formal Request

for Quote (RFQ). Other areas for focus are lead time levelling, MOQ (minimum order quantity) management, supplier negotiation and supply chain improvements. All projects are managed in our online project management tool and governed by joint customer/SerCom steering panels."

According to McCarthy, customer feedback to date has been very positive and the company is confident that significant productivity gains and cost savings can be achieved for customers as a direct result of the new toolkit.
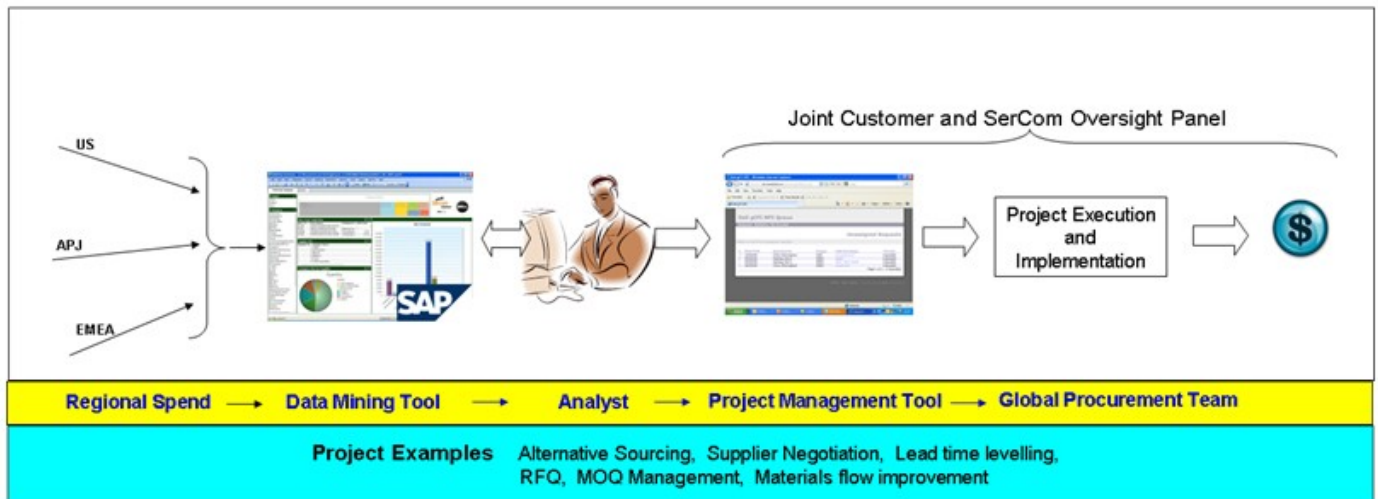
About SerCom Solutions

SerCom Solutions acts as a global outsourcing partner to many of the world's leading ICT companies. These companies are increasingly outsourcing key aspects of their supply chain in order to achieve shorter lead times to market, reduced inventory levels and more cost effective and efficient distribution.

Established since 1978, SerCom Solutions delivers a comprehensive range of outsourced supply chain services, covering kitting, supply chain planning, order and warehouse management, product sourcing, procurement services, distribution and logistics management.

SerCom Solutions is headquartered in Dublin, Ireland with additional facilities in Limerick, Poland, China, Mexico and USA. The company currently employs 230 people.

SerCom Solutions is a wholly owned subsidiary of DCC plc, the procurement, sales, marketing, distribution and business support services group listed on both the Irish and London stock exchanges.
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Review Article
By Edward Sweeney and Dan Park

John Gattorna and friends *Dynamic Supply Chain Alignment – A New Business Model for Peak Performance in Enterprise Supply Chains Across All Geographies* Farnham: Gower Publishing 2009 (ISBN 978-0-566-08822-3).

As we noted in our review article based on one of his earlier books (Sweeney and Park, 2006), Professor John Gattorna's contribution to scholarship and practice in supply chain management (SCM) is substantial and sustained. In this article we pointed up the evolution of Gattorna's thinking from his (1998) *Strategic Supply Chain Alignment* through to the (2006) book *Living Supply Chains* building on the potential impact of SCM as a set of tools and techniques aimed at operational efficiency and total cost competitiveness into the basis for creating a differentiated business model, with SCM as the strategic focus and force for resource concentration. *Dynamic Supply Chain Alignment* takes us a stage further into the dimension of SCM as the basis for effective international and global strategic and operational management.

Dynamic Supply Chain Alignment is written by a mix of practitioners, consultants and academics. There are over 30 contributors to the book, each considering the underlying concept of dynamic alignment of supply chains from his/her own particular perspective. Furthermore, and as suggested by the ambitious phrase "across all geographies" in the book's subtitle, the contributors are based Europe, the Americas, the Middle-East and the Asia-Pacific region. Despite the number and variety of professional and geographical perspectives, Gattorna has succeeded in putting together a volume that is itself characterised by alignment between its various sections and chapters.

A somewhat unusual and quite innovative feature is that the first section of the book consists of reportage of a set of subject-focused panel discussions held as part of the Supply Chain Business Forum that took place in Melbourne in February 2008. Significantly the main themes that were aired at the forum, and find their summary here, are taken up in detail at the theoretical and practical levels in the body of the substantial text that makes up this book. The structure of the main book is predominantly thematic but the reader has to work hard to link the main themes of the first section to the detail: there is not a lot of cross- or back-referencing. This is however not an insuperable problem viewed against the wealth of detail found in the main text.

As in previous works, there is a strong central focus on the "built-to-change" model of business, as distinct from "built-to-last". Gattorna's perspective takes full account of the structural changes in the world economy that have combined to propel the supply chain concept and their alignment of multiple, interactive supply chains towards the centre of contemporary strategic thinking. This perspective is based on a number of key organisational characteristics that derive from the new sets of core competencies on which differentiation in a "built-to-change" business environment is achieved. These are, as Gattorna has argued consistently, integration; flexibility; risk versus efficiency trade-offs; time compression; and quality at best cost.

Given this increasingly complex situation, how do we deduce generally applicable models and principles. Gattorna deals with this complexity in a very powerful way, by identifying four generic supply chain models or frameworks - continuous replenishment, lean, agile and fully flexible – within which general business and detailed operational strategies can be formulated, nowadays increasingly across geographical boundaries. The one central dimension that these generic approaches have in common is thinking "backwards from the customer". Gattorna and colleagues (notably in the chapters by Githens and Kong) lead us to a view of markets that combines the SCM concept with the "death of geography" principle and moves us towards customer-oriented segmentation in which one looks for the commonalities of requirement and purchasing criteria that will drive an organisation's approach to meeting customer needs in a differentiated way that can be rapidly and responsively updated. Thus a market segment can be served by a customised SCM approach in which customer location is no longer a major factor in itself but cost-to-serve and time-to-execute become the critical issues.

The concept of integration, along with alignment, has always been at the heart of SCM thinking, and this is the main supporting theme of Gattorna's work along with the unifying theme of alignment. Indeed both are essential if the full business and operational benefits of SCM are to be realised. The extensive use of case experience through the book is particularly enlightening on this point. The danger of the "silo mentality" persists in many organisations of all types and sizes and any attempt to introduce the "alignment" concept without an equivalent commitment to the "integration" dimension is likely to prove unsatisfactory.

Gattorna's perspective goes further. It is not only on business strategy and organisation that SCM is making its impact. It encompasses broader issues of international economic and political relations. There are perspectives on developments and opportunities in the major emerging areas of the world (the BRIC economies) as well as assessments of the impact of increasingly global SCM on the mature industrialised economies. Moreover Gattorna demonstrates how the principles of SCM apply in a wide variety of activities and organisational types, ranging from humanitarian aid to IT and manufacturing and service activities.

This has major implications for the way in which we think of organisations. The increasingly fuzzy boundaries between interdependent entities are now giving rise to a re-evaluation of basic concepts of "the firm" and consequently of the theory of the firm that has been at the heart of much thinking in applied economics and business strategy. There are two important aspect to this. First, the extended enterprise becomes the unit of competition. Second, the view of a market on a geographical basis gives way to a perspective of available and accessible value, with segmentation based predominantly on customer rather than on product or geography. But we would venture to add a third here that is perhaps not addressed, namely the potential of SCM to enable an enterprise to cope with value migration within the supply-demand continuum. As business globalises, activities migrate to locations where it is financially and operationally logical for them to be.

SCM is potentially important in enabling an organisation to anticipate and re-align itself to the reality of a changing value structure that runs in parallel to the activity structure. Indeed, a perspective on international financial supply chains is missing here – most probably out of considerations of length of an already very substantial work. Nevertheless finance is already an international supply chain (with positive and negative aspects, as we have recently experienced) and many would argue that it needs a little more alignment and integration, thinking backwards from the customer as Gattorna would advocate.

Inevitably in a book consisting of a "Prelude", 28 chapters and a "Last Word" one cannot economically point here to all the detailed insights. Let it suffice to note the very scope of the book, covering the SCM field as a whole from the question of multi-geographical integration through the dimension of corporate social responsibility and environmental considerations to the tax implications of SC structures and management of intellectual capital within the emerging business and organisational models. Not least, as Gattorna himself has long argued, the "people dimension" cannot be overlooked. Organisational and individual behaviour is affected by the application of SCM, and this is emphasised further when one unavoidably introduces an increasingly international and cross-cultural element of business management into the business models that Gattorna advocates.

Professor Gattorna's latest work will provoke much thought not only on the subject of tools and techniques of SCM but on its broader business impact and strategic potential. This substantial and multi-dimensional contribution is a valuable addition to scholarship and practice, and can be read equally profitably by academics, practitioners, and consultants alike.

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