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Supply Chain Learning Needs - Towards a Port Community Perspective

Summary

The traditional role of ports in the wider supply chain context is currently being subject to a process of radical review. In broad terms, the traditional model is being replaced by a model which focuses on higher value and more knowledge intensive activities. This trend requires a change in the way in which new knowedge and skills are developed by staff in companies of all kinds within port communities. Traditional models need to be re-evaluated to reflect the increasing importance of knowledge and skills acquisition, particularly in relation to the supply chain management (SCM) concept and the evolving role of information and communications technology (ICT) in improving supply chain capability. This paper describes the case of NITL's Foundation Certificate Programme (FCP) learning programme with specific reference to its use in addressing some of current shortcomings related to supply chain knowledge and skills in port communities. The FCP rationale is based on the need to move from traditional approaches of supply chain organisation where the various links in the chain were measured and managed in isolation from each other and thus tended to operate at cross purposes, towards more cooperative and integrated approaches.

Key words: supply chain learning, new port models, supply chain cooperation and integration

1. Introduction

Supply chain management (SCM) is concerned with the strategic management of those activities which together provide customers with the appropriate level of service at optimum cost. Recent years have seen significant changes in the nature and the role of SCM. This is a result of increasingly discerning customers, more sophisticated marketplaces and shortening product lifecycles. Furthermore, the trend towards outsourcing of supply chain functionality has resulted in the creation of more virtual supply chain architectures (Clarke, 1998; Crowley, 1998). This, combined with globalisation of markets for product and service inputs, as well as for finished products, has led to supply chain planning and execution becoming more complex than ever. In addition, advanced information and communications technology (ICT) tools are now playing a critical role in enabling integration of processes both within and between companies (McDonnell et al., 2001).

As a result of these changes SCM has moved up the value hierarchy and has shifted from a largely labour intensive orientation to a more knowledge intensive one. This has profound implications for learning needs in all supply chain companies (Hyland et al., 2001; Hult, et al., 2002). In recent years companies generally, and manufacturing companies specifically, have tended to concentrate on those activities which are regarded as core competencies. The corollary of this is that many activities regarded as being non-core have been outsourced (Razzaque, Sheng, 1998; McKinnon, 1999). These trends have resulted in port communities re-evaluating their role in the wider supply chain context. Port communities typically involve a wide variety of constituent companies and have traditionally operated in a quite highly fragmented manner. Furthermore, several of the sectors typically represented in port communities have not traditionally had a strong culture of training and education (Morvillo, 2002). This situation needs to be addressed if port communities, and their constituent companies and organisations, are to achieve their true competitive potential in the coming years.

The National Institute for Transport and Logistics (NITL) in Ireland was established by the Irish government in 1998 to support companies in Ireland in improving their logistics and SCM capability. It provides a range of services to companies, including those companies which typically comprise port communities, all of which are aimed at building better capability in the increasingly challenging market environment. One innovative supply chain learning programme offered by NITL is the Foundation Certificate Programme (FCP). This programme is aimed at existing or emerging supervisory and middle managers, and owner-managers of small and medium size enterprises (SMEs), who have extensive practical experience of one or more aspects of the supply chain but who do not necessarily hold formal academic or professional qualifications. The programme develops participants through modules in all key aspects of SCM, namely: customer service; purchasing management; production planning and control; transport and distribution management; and, warehousing and inventory management. In addition, there is an introductory module and a concluding module

which is concerned with the use of ICT as a supply chain integration enabler. Since 2002, over 100 participants have registered for the programme many of whom have used it as a primary mechanism for developing the supply chain learning required in the evolving business environment.

This paper describes how many of the current shortcomings in relation to SCM learning in port communities can be addressed using the FCP. Following this introduction, the paper outlines the recent strategic evolution of ports and discusses the issue ICT as a key enabler of integration in supply chains generally, and in port communities specifically. The paper then goes on to describe NITL's FCP in detail, with specific reference to its use in addressing some of current shortcomings in port community learning. In essence, the action research methodology is adopted to assess the role of initiatives such as FCP in bridging the gap which is currently evident between learning theory and port community reality. Following a discussion of the pertinent issues, a number of concluding comments and observations are made.

2. The Evolution of Port Community Supply Chains

The traditional role of ports in the wider supply chain context is currently being subject to a process of radical review. A number of key issues are changing the supply chain management (SCM) strategic landscape. Arguably, the most significant such issues are internationalisation (or globalisation) of supply chains, vertical disintegration as a result of outsourcing and the changing role of the supply chain in strategic differentiation. These changes are forcing port communities globally to reassess their service provision models with a strong focus on the enhancement of value adding capability. In a sense, ports are complex entities supporting the procurement of raw materials and the manufacturing and distribution of goods (Carbone, de Martino, 2003). They are potentially members of many supply chains. Port competitiveness is becoming increasingly dependent on external coordination and control of the whole supply chain (Huybrechts et al., 2002). Ports are widening their role moving from a traditional interface with the ship to a more logistical orientation of their activities. This means that the landside impact on port operations has to be considered, forcing ports to increase their market orientation. Consequently, this process has lead to a substantial growth of port operators on a global scale. A similar process has affected dedicated terminals. In broad terms, the traditional model is being replaced by a model which focuses on higher value and more knowledge intensive activities.

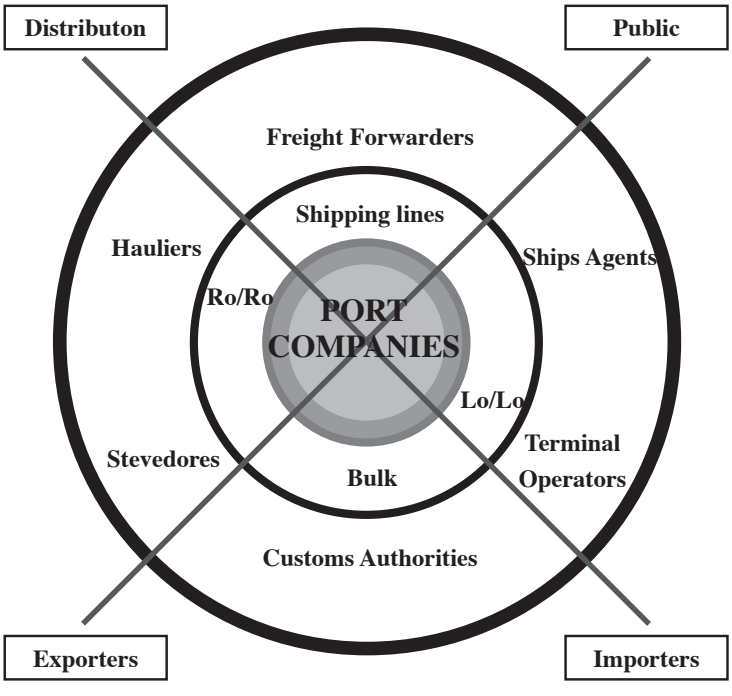
The authors are currently involved in an EU supported project[1] which aims to to raise the skills of the maritime community in three ports in the south-east of Ireland and three ports in south Wales (http://www.i-sea-net). This will be achieved through:

[1] ISEA-NET is supported by the EU under the INTERREG IIIA programme

- The identification of training needs and the delivery of appropriate training in basic ICT upskilling;
- Delivery of an awareness programme of the specific benefits to the sector of ICT; and,
- The design and development of a Maritime Community Portal to deliver training services and supports. It will also bring about an awareness of how practical business benefits can be achieved through an Electronic Community Information Service.

Figure 1 shows the key beneficiaries of the project and the main companies who will make use of the proposed portal. The figure indicates that port community members (including shipping lines, terminal operators and stevedores) must interact with a wide range of organisations in the wider supply chain.

Figure 1 – Typical Port Community Participants (http://www.i-sea-net)



In the authors' view, this type of configuration highlights the need for integration at three levels:

- Within individual companies that comprise port communities (internal integration);
- Between companies that comprise port communities (port community integration); and
- Between the port community and external organisations (external integration).

Recent developments in ICT have facilitated these integration processes. Indeed, ICT can be considered an essential enabler of integration at all three levels. The next section provides and overview of ICT as a supply chain integration enabler, with specific reference to its use in ports.

3. ICT in Port Community Supply Chains

ICT has transformed the way companies in all sectors conduct their businesses. The movement of goods along the supply chain is reflected by corresponding movements of information. For example, the moment an item is sold at the supermarket check-out, this information is captured via a bar code reader and can then be read immediately anywhere in the distribution chain. Computers communicate with other computers via local area, national and, in some cases, international networks. However, without properly designed supply chains and capable people, this will not succeed.

Broadly speaking, there are two types of supply chain ICT solutions: point solutions and enterprise solutions (McDonnell et al., 2004). Point solutions fulfil a particular function within one of the component parts of the supply chain; buy, make, move, store or sell. Enterprise solutions, on the other hand integrate elements of the enterprise or the supply chain, linking the output of one action to other related elements. In this supply chain context, a wide range of transportation management systems (TMS) are commercially available, and typically include following functionalities:

- Complete support of transportation order management, transport planning, and fleet management;
- Communication with other supply chain participants. Most interfaces are supported by electronic data interchange (EDI). However the use of internet technology will enhance communication between supply chain participants;
- Open databases for execution and administration of transport activities; and
- Evaluation of transportation key performances indicators (KPIs)

A brief description of an example of a TMS is shown in Table 1.

Mandata provide computerised solutions for the haulage business, from traffic management to vehicle costings to workshop management. These solutions can, for example, be used to track a vehicle's progress, calculate how much it is earning, or highlight when tachograph re-calibrations are due.

Table 1 - Example of a 'Move' Solution (http://www.mandata.co.uk)

Specifically within port communities, ICT has become a key enabler of both internal and external integration. Its importance is reflected in the significant investment which has been made in technology platforms within port communities in recent years. The information flow upon which the port operation relies needs to be extended into a wider environment. It also brings the port's system up against other requirements - such as road or rail traffic management systems. Several major ports around the world including Rotterdam, Houston, Hong Kong and Singapore, have developed electronic port communities systems (PCS) that use Internet based technology to connect the various parties involved in moving freight such as shippers, forwarders, insurers, customs, terminal operators, land, ocean and air carriers. A good example is Hutchison Port Holdings's e-commerce platform 'portsnportals', which offers a full range of Internet-enabled business-to-business (B2B) services through its arrangement with Arena, a leading supplier of software for SCM solutions (Evangelista, 2005). In the port of Antwerp, for example, Seagha has become a major player in the supply chain largely as a result of its ability to better integrate port community companies through appropriate ICT (http://www.seagha.com). The diversity of companies within port communities makes the achievement of the desired levels of integration difficult.

Learning needs within port communities are evolving as the strategic role of ports themselves evolve. These changes require a change in the way in which new knowledge and skills are developed by staff in companies of all kinds within port communities. Traditional models need to be re-evaluated to reflect the increasing importance of knowledge and skills acquisition, particularly in relation to the SCM concept and the evolving role of ICT in improving supply chain capability. In this regard, the effective adoption of the supply chain learning paradigm (Bessant et al., 2003; Sweeney, 2003) has significant potential. The following section provides an overview of NITL's Foundation Certificate Programme (FCP) and describes how this programme is used to address some of the key learning requirements within port community companies.

4. NITL's Foundation Certificate Programme (FCP) in Supply Chain Management

4.1 Introduction

The National Institute for Transport and Logistics (NITL) was established in Ireland as a result of a major study commissioned by the Irish government in 1995. The report (Forfas, 1995) recognised the importance of transport, logistics and SCM to the continuing success of the Irish economy based on a number of factors:

- the potential economic and service benefits;
- the open nature of the Irish economy (both imports and exports represent an large proportion of economic activity and economic success depends on dynamic export-oriented firms in both the manufacturing and service sectors);
- Ireland's relative geographical peripherality;
- the changing nature of customer-supplier relationships with a strong emphasis on the development of partnership approaches; and
- developments in ICT as a key enabling technology in supply chain integration.

The report went on to recommend the establishment of "a single new national centre of excellence to support companies in improving transport, logistics and supply chain effectiveness". NITL came into existence in 1998 as this centre of excellence (http://www.nitl.ie). It achieves its mission through awareness creation activities (conferences, roadshows, magazine, etc.), the provision of support tools (self-audit packs, service directories, benchmarking clubs, etc.), delivery of consultancy services, research (both academic and applied research) and the provision of a range of innovative supply chain learning programmes.

4.2 NITL Learning

NITL Learning is the training and education division of NITL. It focuses on improving the supply chain capability of organisations through the delivery of a range of both in-house and open learning programmes. Currently the main programmes are as summarised in Table 2 (below). All programmes are based on the supply chain learning paradigm. This approach emphasises the benefits of knowledge development in a broad, multi-company, supply chain environment.

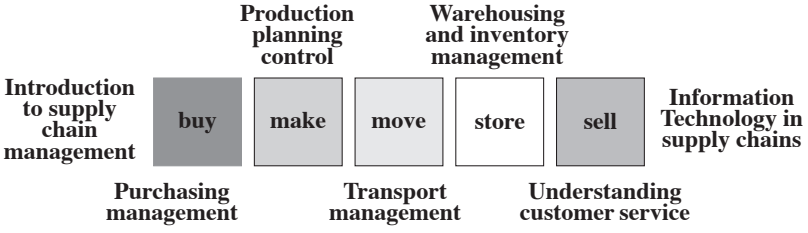
Table 2 - NITL's Supply Chain Learning Programmes

The range of programmes reflects the requirements of different levels of staff in organisations in all parts of the supply chain (e.g. manufacturing, logistics service provision and retail). The most recent addition to the portfolio is the Foundation Certificate Programme (FCP) which came into existence to satisfy a particular requirement and which has been adopted by several port community member companies in Ireland.

4.3 FCP background and rationale

The FCP was introduced in 2002 to meet a specific requirement which had become apparent to NITL in earlier years. It is aimed at existing and emerging supervisory and junior management staff, or owner-managers of small and medium size enterprises (SMEs), who have extensive experience of one or more aspects of the supply chain but who do not necessarily hold formal academic or professional qualifications. The latter is a product of the traditional lack of a training and education culture in the field, particularly within transport and logistics service sector (Morvillo, 2002). The structure of the programme is as shown in Figure 2 (below).

Figure 2 - Structure of FCP



The programme aims to develop participants in all aspects of SCM based on this approach. Most participants have detailed operational knowledge of that aspect of the supply chain in which they are most experienced. However, their knowledge of other aspects of SCM is usually very limited and their view of the role of their specialist area in the context of overall supply chain performance is usually also very narrow. From the perspective of core port community member companies, this specialist knowledge tends to be in the area of transport and logistics with knowledge of other supply chain areas tending to be extremely limited. The programme endeavours to develop participants in all aspects on the supply chain with a strong emphasis on the interaction between the constituent areas.

4.4 FCP – delivery and assessment

Each programme subject is delivered as a discrete self-contained module of approximately 20 hours duration. The twenty hours is usually delivered as a block from Thursday evening to Saturday afternoon. Each module is conducted several times a year in a variety of locations in both the Republic of Ireland and Northern Ireland. Module assessment is carried out using post-module assignments (PMAs). Each PMA tests participant knowledge of the theory and concepts of the subject, as well as of

the best practice models introduced during the module. Furthermore, it provides the participant with the opportunity to apply the knowledge acquired during the module in their own workplace. Submission of completed assignments usually takes place eight weeks after the module has been completed. In addition, all participants are required to complete a major in-company project towards the end of their programme of study. These projects are concerned with the analysis, planning and implementation of major supply chain change management initiatives in their organisations and are usually conducted over a three month period. While the period taken to complete the programme is deliberately kept flexible the average completion time is approximately 18 months. This involves taking modules at intervals of approximately two months. Participants who successfully complete all seven modules and the associated PMAs, and the major in-company project, are eligible for NITL's Post-Experience Certificate in Supply Chain Management.

5. Discussion

5.1 FCP in port communities

The FCP is particularly relevant to the evolving learning needs of port community member companies for a variety of reasons. Firstly, management within these companies increasingly needs to be knowledgeable in relation to a range of supply chain concepts and methodologies. In most cases it is no longer sufficient to have detailed knowledge in relation to specific transport and logistics issues. The scope and range of activities carried out by the companies has expanded. This in turn requires that the breadth of knowledge of managers at all levels expands accordingly. Customer companies are increasingly seeking to use a "one-stop shop" approach which provides complete supply chain solutions and not just limited transportation services. In this environment the breadth of knowledge provided by the FCP is becoming not only desirable but essential.

Secondly, the interaction between participants from companies in different parts of the port community supply chain promotes the cross-fertilisation of thinking. This can be particularly beneficial as it helps to foster a better understanding of evolving customer requirements and challenges. In the current environment of increasingly competitive and sophisticated markets, more discerning customers and shortening product life cycles this learning can be invaluable.

Finally, several design features have been incorporated into the programme to facilitate the learning process for busy managers in the sector and in particular for owner-managers in SMEs. These are based on well established generic paradigms of lifelong learning. For example, participants attend modules at their own pace and not according to pre-set rigid schedules. In addition, modules are generally conducted at weekends thus avoiding serious disruption to the busy schedules of participants. As a

result of the traditional lack of a learning culture in many of the companies, for many participants registration on the FCP is their first foray into education for many years and can be quite a daunting prospect. With this in mind, NITL provides extensive support to participants in terms of the development of appropriate learning skills.

5.2 FCP in developing ICT knowledge

The FCP has a strong focus on ICT as a key enabler of supply chain integration. The introductory module addresses this issue very strongly. Each of the five functional modules outlines the role of ICT in the specific areas using examples of "point" solutions to illustrate key learning points. The focus of the final module ("IT in the Supply Chain") is on integration. At this point in the learning cycle participants have been exposed to detailed knowledge concerning the specific elements of the supply chain and it is important that the central message of integration is reinforced. This final module does exactly that. The theme of the module concerns the role of ICT as a key enabler of supply chain integration. Participants are introduced to a range of SCM ICT applications, as well as to best practice in devising and implementing ICT strategies for the supply chain. In all cases there is a strong emphasis on the need to move away from the traditional approaches which were very often characterised by fragmentation towards approaches which are characterised by integration. Within third party logistics service providers (3PLs) in particular, and in port community member companies more generally, this has become a key issue in terms of ability to provide integrated supply chain solutions to customers in a range of sectors. Another issue which represents an important part of this module is the effective use of supply chain information in supporting the elimination of waste and non-value adding activities (NVAs). An NVA is any activity which adds cost or time to supply chain processes without necessarily adding value from a customer perspective. For example, the carrying of excessive levels of inventory is a common form of waste in supply chains. Inventory reduction depends on the ability of a supply chain to control inventory. Inventory control is, in turn, dependent on inventory visibility. ICT represents an opportunity to improve the level of inventory visibility across the supply chain, thus improving the chances of success in terms of inventory reduction.

5.3 FCP and relational learning

Relational learning processes are based on the willingness to encourage organisational integration, the search for new solutions and, in general, the decisive change for improving performance and process efficiency (Evangelista et al, 2004). The FCP rationale is based on the need to move from traditional approaches of supply chain organisation where the various links in the chain were measured and managed in isolation from each other and thus tended to operate at cross purposes, towards more

integrated approaches. In this way, organisational integration is not only encouraged but represents the very essence of the programme's philosophy and structure. The search for new solutions is also an important element of programme philosophy. Participants are introduced to supply chain best practice models during all programme modules. Assessment of modules is carried out using in-company assignments and a major in-company project. These mechanisms provide the opportunity to relate best operational practice back to participating companies. Furthermore, as the FCP is a multi-company programme, a typical module running involves participants from many parts of the supply chain (e.g. freight forwarders, stevedores and shippers). This encourages the exchange of knowledge in a non-threatening and low risk environment and thus encourages improved mutual understanding and joint problem solving across the external supply chain. From a logistics service provision perspective specifically, staff often attend modules alongside staff from their customer companies. This has several benefits, particularly in facilitating better understanding of evolving customer requirements. Similarly, staff from various departments in individual companies often attend modules together. This facilitates a similar approach in relation to the internal supply chain. The cross-fertilisation encouraged by these mechanisms ensures that learning in achieved not only by relating but also by co-operation, by networking and from customers.

6. Conclusion

Supply chains have become more global as a direct result of structural changes in the world economy. In addition, they have become more virtual as companies outsource key supply chain functions. These two factors have resulted in SCM becoming a more important determinant of competitive advantage than ever before. They have also made SCM more complex than ever before. In developed economies the continuing shift in emphasis away from manufacturing and towards the provision of high-value services will have a major impact on the essence of SCM in the coming years and decades.

Ireland will be particularly affected by this trend due to the open nature of the economy and the high proportion of imports and exports as a percentage of GDP. Logistics and SCM will become less about the physical movement of material on to and off of the island. In this context, there is a need to think of SCM is a radically different way. In short, SCM will need to move up the value-adding hierarchy. SCM will become less concerned with the physical movement of material and more with the management of information and knowledge. ICT is a key enabler in this process.

These changes have has profound implications for the knowledge and skill base of managers at all levels. It also has implications in terms of ICT and communications infrastructure. Nowhere is this more evident than within ports and port communities. The approach to addressing supply chain learning needs outlined in this paper has the potential to significantly enhance the value adding potential of ports in this evolving environment.

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Potrebe za učenjem u dobavljačkom lancu – ususret budućoj lučkoj zajednici

Sažetak

Tradicionalna uloga luka u širem kontekstu dobavljačkog lanca trenutačno doživljava korijenite preinake. U širem smislu, tradicionalni model zamjenjuje model usmjeren prema intenzivnim aktivnostima većih vrijednosti i znanja. Takav trend zahtijeva drukčije načine usvajanja znanja i vještina u raznim vrstama organizacija u lučkim zajednicama. Tradicionalne modele valja podvrći ponovnoj procjeni kako bi odražavali sve veći značaj stjecanja znanja i vještina, posebice u odnosu na koncepciju upravljanja dobavljačkim lancem (SCM – supply chain management) i sve veću ulogu informatičke i komunikacijske tehnologije (ICT – information and communication technology) u unaprijeđivanju mogućnosti dobavljačkog lanca. U ovom se radu opisuje program učenja Fondacije NITL (NITL's Foundation Certificate Programme – FCP) s posebnim osvrtom na njegovo korištenje u rješavanju nekih tekućih nedostataka u vezi sa znanjem i vještinama o dobavljačkom lancu u lučkim zajednicama. Taj se program temelji na potrebi za napuštanjem tradicionalnih pristupa organizaciji dobavljačkog lanca kojima se mjerenje i upravljanje pojedinim karikama u lancu obavljalo odvojeno od ostalih i tako izazivalo i sukobe u djelovanju s različitom svrhom, a usmjeren je ka integralnim pristupima koji se temelje na boljoj suradnji.

Ključne riječi: učenje u dobavljačkom lancu, novi lučki modeli, suradnja i integracija dobavljačkih lanaca

Le esigenze di nuove competenze logistiche di fronte all'evoluzione della attività portuali

Sommario

Nel corso degli ultimi anni, il modello tradizionale delle attività portuali sta subendo un radicale ripensamento a causa delle profonde trasformazioni che stanno interessando l'organizzazione e la gestione della supply chain. Tali cambiamenti stanno infatti spingendo verso l'affermazione di un nuovo modello di portualità caratterizzato dalla creazione di attività a maggior valore aggiunto e da una focalizzazione sulla attività immateriali. Questa tendenza richiede un cambiamento nel modo in cui la conoscenza e le abilità vengono sviluppate e gestite in tutte le imprese coinvolte nelle attività portuali. E' necessaria un rivalutazione del modello tradizionale di portualità che tenga conto dello sviluppo della conoscenza e dell'acquisizione di nuove competenze professionali coerenti rispetto al concetto di supply chain management (SCM) ed al ruolo che hanno assunto le tecnologie informative e della comunicazione (ICT). Questo articolo descrive il caso del Foundation Certificate Programme (FCP) - una iniziativa di formazione realizzata dal National Institute for Transport and Logistics (NITL) di Dublino (Irlanda) - specificamente progettata per rispondere alle esigenze attuali di aggiornamento e sviluppo delle competenze logistiche in ambito portuale. La logistica su cui il FCP è stato progettato si basa sul passaggio da un approccio tradizionale di organizzazione delle attività logistiche - in cui le

attività della supply chain sono misurate e gestite in maniera del tutto indipendente e conflittuale l'una dall'altra - ad una concenzione basata su di maggiore cooperazione ed integrazione logistica.

Parole chiave: nuove competenze logistiche, evoluzione dei modelli di portualità, cooperazione e integrazione logistica