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Sustainable Distribution: The role of EDI and data exchange hubs

Sustainable distribution has created opportunities and challenges for today's logisticians: previous restrictions on collaboration and ways of working are up for discussion, new technologies are entering the marketplace; but in a world where industry leaders want to make progress there are a wealth of process related barriers to overcome. Modern day Electronic Data Interchange (EDI) and data exchange hubs have an important role to play in taking down some of these barriers.

Originally the name for a set of standards for electronic message formats, the term EDI is also used for the whole process of the electronic exchange of business documents. Within the logistics market, EDI connectivity has been a standard way of exchanging data between warehouses and their customers for many years. The cost and complexity of traditional EDI has delayed the integration of transport data flows where contracts are typically shorter, IT resource scarcer and the number of suppliers higher. In this paper we will concentrate on transport data flows and why EDI is now an affordable option for this sector.

Why does EDI have a role in enabling sustainable

distribution? Normally justified through savings on administrative staff, EDI also speeds up the transmission of data between partners. Most sustainable distribution initiatives are dependent on successful transport planning activities to deliver their full potential. Currently too many transport planning activities are squeezed through lack of time and this article will look at how EDI can improve this situation.

The second sustainable distribution opportunity we will discuss is that of collaborative partnerships. Even when transport is normally an in-house activity collaboration brings a need for data exchange with the partner company. Traditionally EDI has been implemented in one-to-one relationships but modern web based technology can support EDI hubs where a single interface may be used for many relationships. It is the many-to-many aspect of such hubs which is transforming the ease and affordability of EDI messaging. Such hubs can also provide a range of value added services which support supply chain processes and have a role to play in enabling transport sharing agreements.

So let's start by demystifying EDI!

Gobbledegook and options

Electronic Data Integration has been around for a long time but with the advent of the internet, and new service offerings related to web based EDI, the benefits of the technology are now within the reach of many more companies.

It is worth pointing out at this stage that what we are talking about in this article is truly integrated electronic document exchange. We are not talking about emailed PDF transport orders or Proof of Delivery (POD) documents (although for smaller volume business partners such documents have a role to play) but instead the integration of partners so that documents are taken directly into and out of your main business systems without the need for human intervention.

The world of electronic document exchange is populated by a bewildering number of alternative standards and technologies. There are standards for the message format (the equivalent for the layout on the page) and also for the communication methodologies (the equivalent of sending your letter by post, registered post, fax etc.).

Before the internet there were two major EDI message standards used in the UK and Europe, Tradacoms (mainly a British Retail Standard) and UN/EDIFACT. Pre-Internet integrated EDI was achieved by routing messages via a Value Added Network (VAN) which would receive and pass on messages for users and charge for this service. With the arrival of the Internet these VANs are no longer necessary and we now have the option of new communication methodologies, such as AS2, which allow successful message transmission to be receipted so that users can see proof of message receipt including a date and time stamp.

Also with the Internet came a host of new message formats including those based on eXtensible Mark-up Language (XML), a multiple use data specification. XML facilitates the sharing of data between systems without

the need for multiple layers of conversion. However there are hundreds of XML "standards" in use, some industry specific and some generic.

And then there are the companies using CSV or "flat file" standards, which are essentially data lists and are created from applications such as spreadsheets.

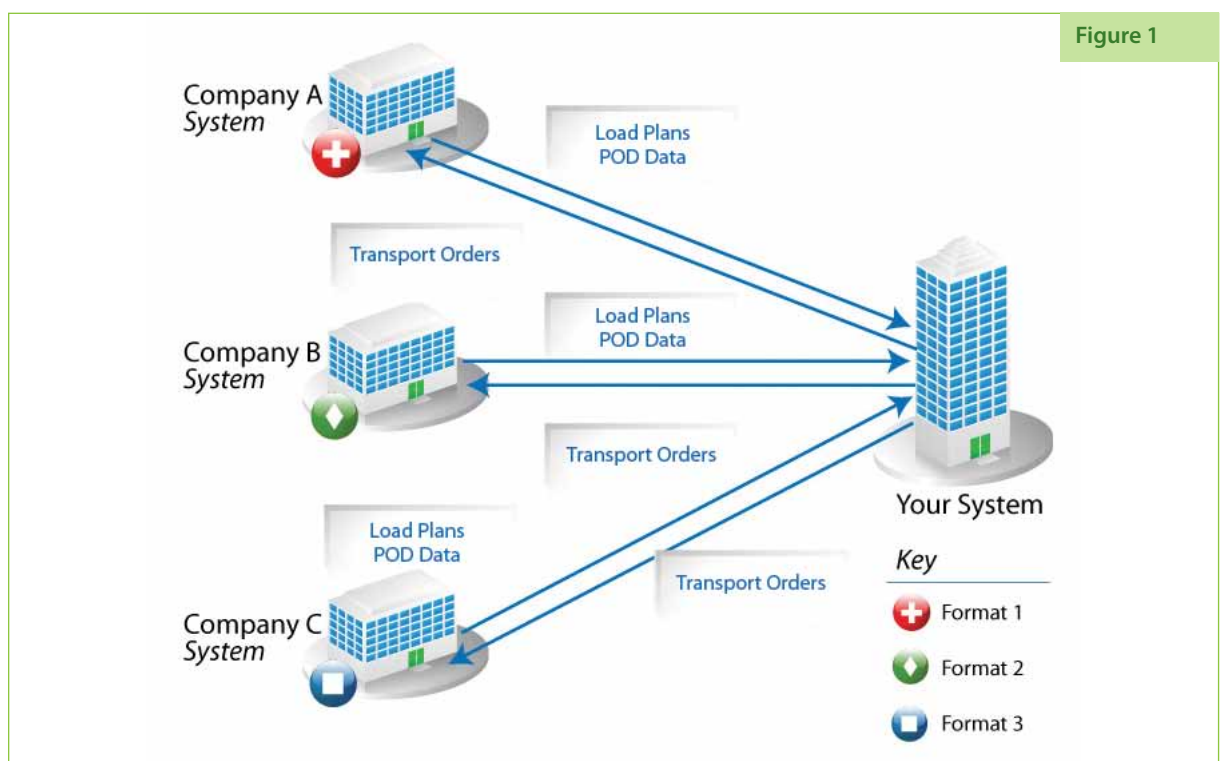
The main problem arising from the profusion of EDI message formats and communication methodologies is that you can bet that each business partner you wish to integrate has a different requirement, based on the capabilities of the system they are operating or their accepted standards. Companies integrating with their partners on a one-to-one basis therefore risk the situation illustrated in Figure 1, where each new relationship requires either the sender or recipient to reconfigure their messages in a new format. This is resource intensive and risks delaying or even stopping the integration.

An alternative way

With the advent of the Internet, a new way of providing EDI services has arisen. It is known by many names, 'Software as a Service (SaaS); 'Outsourced EDI'; 'Shared Service Centres' to name but a few.

Although the name changes all these provisions offer the same basic solution: they will roll out EDI to your trading partners for you. All such services should provide you with a service based entirely on the principle that you pay for what you use and no more. Some partners will charge based on the number of transactions, some on a flat fee per trading partner and message type, but the basic principle holds that you pay for what you use.

This gives you an advantage straight away. It allows you to dip your toe in the ocean of EDI – for example, allowing you to try out, say, messaging to five trading partners to gain experience of EDI in practice before you commit further. You will need no capital expenditure outlay, and will have a proof of concept.



It also allows you to start with, and pay for, only one type of message type (say, the transmission of transport requests) and develop it gradually (for example, by rolling out POD messages from your suppliers later, followed by exceptions data from their telematics systems).

The EDI hub concept

The SaaS vendor's expertise should be in the 'translation' of message format from one partner to another, allowing all parties to work in their chosen format. As the SaaS vendor adds customers within a certain market some of the trading partners will be common with an existing partner. This reduces the workload associated with integrating this partner and creates a virtual 'hub' of many-to-many relationships. Each customer only pays for the connections to their own partners but the cost of this integration is reduced because the links can be used for more than one relationship. This many-to-many mapping may be seen in Figure 2 below.

Other services provided by a SaaS EDI hub

Providing EDI integration together with the associated support services are the core offerings of a SaaS EDI service, but there are additional services such hubs can provide which are directly relevant to the logistics environment. Figure 3 illustrates the range of potential services, the less obvious of which are described overleaf.

Translation Services – these are a key offering of the EDI hub and allow the sender and recipient each to use the message format which suit their business. It allows one stream of information from a shipper to be transmitted to several carriers, each in a different format. For smaller or

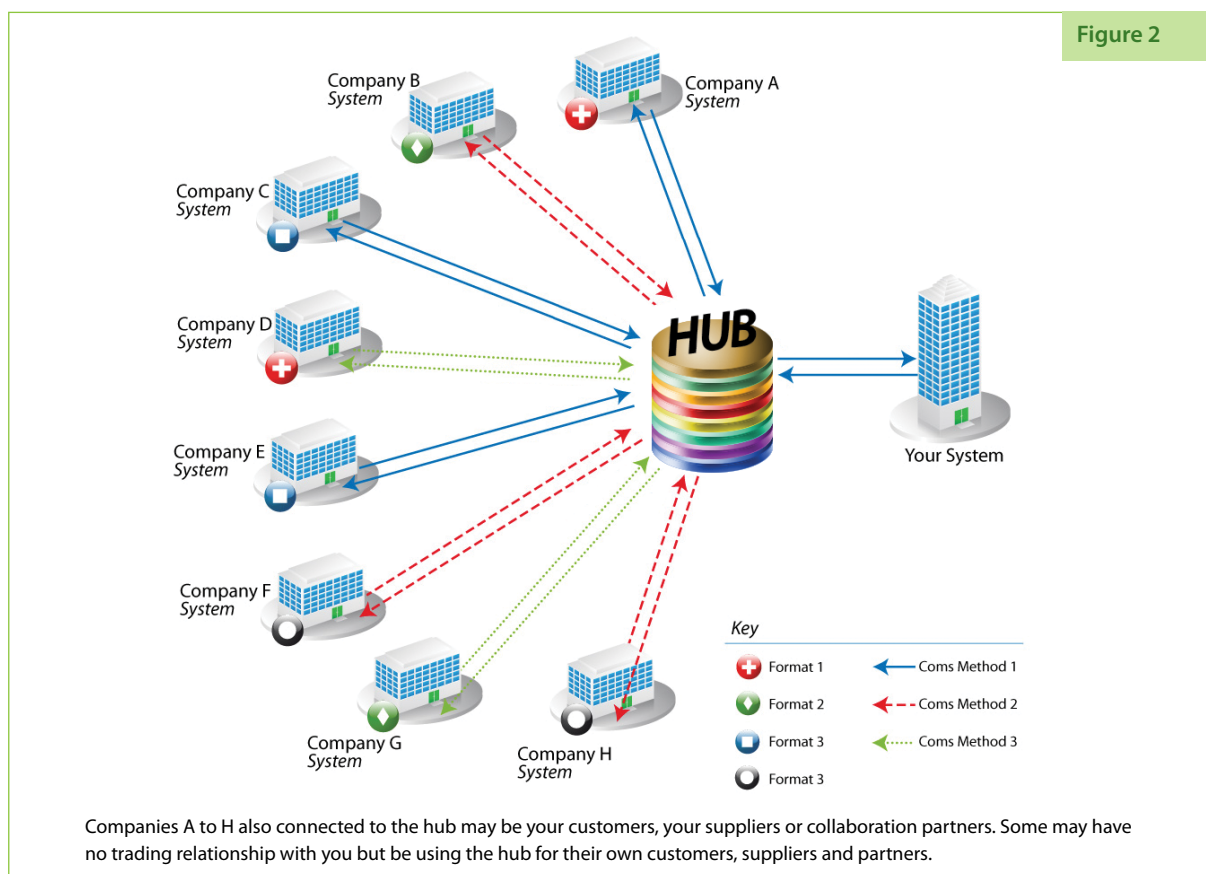
temporary suppliers the hub can translate the message into a CSV or even a PDF file and automatically attach it to an email and send it to the supplier. Similarly the hub can receive a variety of messages from your trading partners. This will include data from spreadsheets and even text messages which can be translated into a message your system can accept.

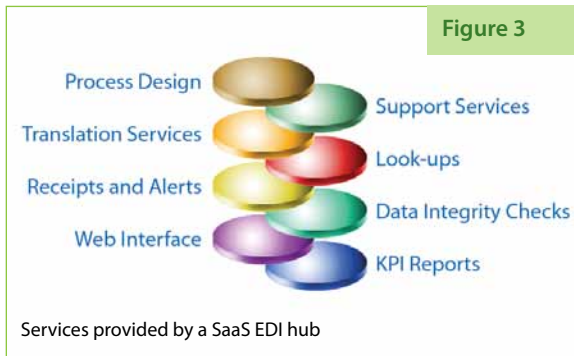
Look-ups – where translation services alter a message's format, look-up services populate or convert the content of a message. Content data is often different in different systems: for example, delivery locations, load numbers and reason codes. Trying to ensure that all systems have the same data standards or reason codes is unrealistic. However the hub provider can use look-up tables to translate between your system requirements and those of your supply chain partners.

Electronic receipts and alerts – your SaaS EDI supplier should also provide the partners with the ability to see message receipts giving the exact time and date the message was received. This can be extended to provide alerts if messages have not been received by a certain time or have been rejected after data integrity checking.

Data Integrity Checks – the best SaaS EDI suppliers can perform a number of data integrity checks before a message is passed on to the recipient. These include, in ascending order of complexity:

- Checking that all mandatory fields are completed.
- Checking that the format of a field is correct for the recipient.
- Checking the content of a field. This can include cross referencing the contents with another data file that has been provided to the EDI hub, e.g. product codes are valid.





- Checking consistency between messages, e.g. that a POD document quotes a valid load number from a message previously exchanged by that supplier.

Web Interface – your hub’s web interface will allow suppliers and customers to access all business documents exchanged through the hub in a clear, humanly readable format. Some providers will also provide a web interface with functionality to allow non-integrated smaller or temporary suppliers to enter data not exchanged by EDI.

KPI Reports – all data passed between you and your partners will be held on the EDI hub’s database. It can then be used for KPI reporting across all your logistics partners or just for one relationship.

Process Design – an EDI hub specialising in logistics integration will have tackled many different logistics messages in the past and will have template messages available as well as solutions for a range of supplier capability. They will be able to support you in the process design associated with a new collaboration or the integration of your current processes; either utilising their own resource or through the services of partner consultancies specialising in this field.

So how does this help Sustainable Development?

The potential to use SaaS EDI hubs to improve the data flow and supply chain visibility when we work with logistics partners is huge. But how can this help drive sustainable distribution? Aside from normal efficiency improvements, and the saving of paper, there are two main areas in which EDI hubs have great potential to enable sustainable distribution improvements: by freeing up more time for the transport planning function and by supporting collaborative partnerships. Let’s take each of these in turn...

Reducing empty running – giving sufficient time for transport planning

Defra’s Food Industry Sustainable Strategy (FISS) identified a ‘Big 6’ opportunities list for sustainable distribution.

These are:

- Larger vehicles
- Out of hours deliveries
- Modern engine design
- Vehicle telematics
- Transport collaboration
- Logistics system re-design

Of these, five are related to improving vehicle fill: either through increasing the load size or reducing the amount of empty running or both. Fundamental to this, although not explicitly mentioned, is effective transport planning

and scheduling. No transport organisation can make the best use of larger vehicles, out of hours deliveries or real time vehicle information if the transport planning process is curtailed through delays in receiving the right data or does not allow dynamic changes to load plans.

By transport planning we mean here the activity which matches the deliveries required for a particular period of time with the transport resources available (vehicles and drivers). Transport planning is typically done with the aid of specialist software, often as part of the 3PLs Transport Management System (TMS). The output of the activity is a grouping of deliveries into loads together with confirmed collection and delivery times; data which normally needs to be shared with the despatching warehouse and shipper.

Where companies outsource transport, they often differ greatly in the degree to which transport planning activities such as booking in with customers are part of the outsourced provision. This will change the fields of the messages exchanged and the more freedom the transport provider is given the more data will need to be exchanged at the end of the process.

There are a number of ways in which we can improve or optimise the transport planning activity and therefore improve vehicle fill:

- Reserving the maximum amount of time possible for the activity, i.e. passing transport requests to the 3PL or transport team as soon as possible, in an integrated environment, so that no re-keying is required, and with the correct volumetric data. Transport requests should not be batched up for transmission, but be sent on as soon as they have been generated by the ERP system.
- Ensuring the activity is carried out in a transport planning environment with the best overview of the total vehicle fleet and all the transport requests for that fleet. In the case of outsourced transport this will normally be the 3PL rather than the manufacturer or retailer.
- Using an expert planning tool for the transport planning.
- Giving flexibility on delivery and collection times to the transport provider where possible.
- Allowing changes to load plans up to the time warehouse picking begins so that later transport requests can be added to loads.

In the case of outsourced transport, giving the planning process to the 3PL, including the booking in with customers and warehouses where possible, requires a flow of data back from the 3PL informing the shipper and despatching warehouse of the agreed delivery and collection times, the load plan including loading sequence, the load number and any changes to the load plan from the last communication.

Allowing changes to load plans up to the point at which picking commences, which is vital for optimising load fill in a part load environment, requires status communication between the warehouse and the 3PL.

To summarise, enabling efficient load planning requires transport requests to be translated into logistics units by the shipper and sent directly into the transport planning system of the transport provider. Both the shipper’s ERP system and the warehouse WMS then require data on the load plan directly back into their system. With one

transport provider and one warehouse this still represents an IT project on both sides – but what if the shipper is working with several transport suppliers and a couple of warehouses and what about the sub-contractors? This multiplicity of interfacing partners only increases when collaboration is brought into the mix.

Collaboration – the challenges

As seen above, even without collaboration there are many interfacing relationships in a normal transport fulfilment process. This is only made more complex when manufacturers and retailers collaborate together to fill vehicles.

With all collaboration methodologies the challenge is still the same: how to efficiently pass data between the parties involved in the collaboration without requiring a major IT or process design project. As a manufacturer or retailer may eventually have a number of different collaboration partners across its business (to improve vehicle fill in different sectors, geographies or on specific routes) the easier and more efficient it is to set up the data flows the more progress may be made.

Both parties in any collaboration will have their own process design for transport fulfilment which suits their particular business and ways of working. They will often be integrated with their internal transport departments or 3PLs and have specific processes for POD reporting and pallet management.

It is important not to limit collaboration to opportunities based on shared storage, full loads or to assume that a shared storage 3PL will necessarily be the optimum transport provider. By simplifying the establishment of data exchange to the requirements of each party, modern EDI hubs can allow collaborating partners to consider the full range of cross docking, outsourced transport, different partners for different routes without sacrificing process efficiency or spending endless hours in process design meetings!

To understand the data flows better we can look at a typical grocery fulfilment process with two collaborating manufacturers, two despatching warehouses and a shared transport provider. Figure 4 opposite shows that data flows for the scenario where the transport is outsourced to a third party. If the transport was provided by one of the manufacturers the data flows to that manufacturer's ERP system would clearly be an internal rather than an external interface.

Traditionally many of the data flows in Figure 4 involved paper based processes with the keying in of data at the haulier and the manufacturer. Today more and more manufacturers expect these data flows to be integrated with their ERP systems which poses a challenge both for smaller or less sophisticated transport suppliers but also for collaboration projects to deliver the same level of automation and integration. The flows associated with claused PODs in particular, which require both product level information and an agreement on reason codes, can require significant project resource to deliver if integrated on a one-to-one basis.

In contrast, a logistics industry EDI hub allows each manufacturer and transport provider to set up their data and message requirements once and use this interface for several relationships (customers, suppliers and collaboration partners). The hub provider should

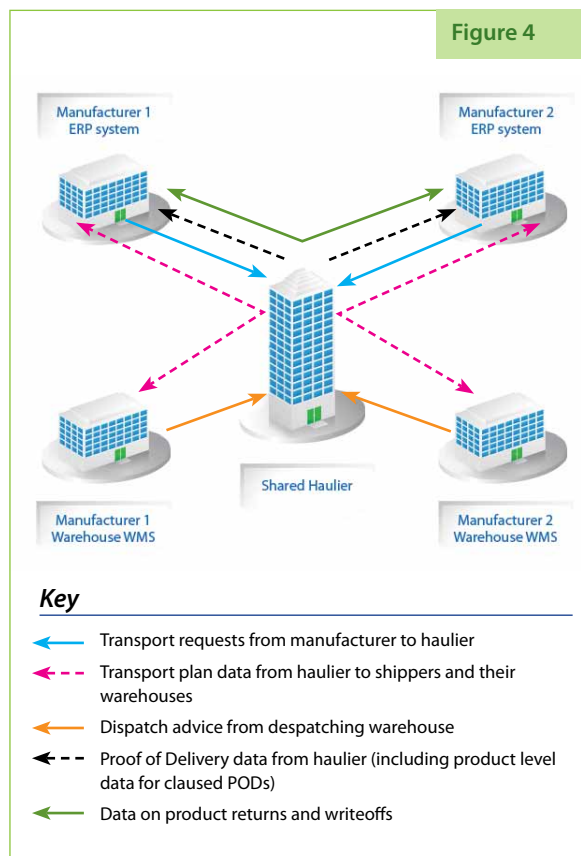
engage with each transport supplier and, depending on the level of sophistication of their systems, either provide full integration or provide an alternative method of generating the message required by the manufacturer. By developing standard processes which can be 'translated' into the requirements of each partner the hub also enables businesses to set up more relationships efficiently to suit different parts of their business.

Who benefits and who should pay?

Conventional EDI thinking is that the main beneficiary of an EDI message, in terms of efficiency savings, is the recipient. For a transport order this would be the transport provider, who would no longer have to employ someone to type the order into his TMS system. For a POD message this would be the shipper, who would receive the delivery data directly into their ERP system, saving on administration costs and facilitating prompt invoicing for the goods.

Sustainable distribution thinking turns this convention upside down. The savings and benefits from increased load fill from allowing hauliers to plan in their own systems and to have more time for this activity will be of another magnitude altogether. If the same manufacturer spent £10m on transport a 2% increase in load fill, should deliver in the region of £200k p.a. in transport savings in addition to the congestion and environmental, and warehousing resource benefits. In contrast the savings from eliminating the keying in of transport orders will vary by supplier but will typically be of the order of 40p per delivery. For a large manufacturer, with 50,000 transport orders p.a. their transport suppliers would save a total of around £20k p.a. on this activity (although this would be higher if there were administrative savings at the manufacturer as well).

Providing a process for adding late orders to loads up to the point of picking would deliver further savings to the manufacturer.



Different SaaS EDI vendors have different pricing models. However we would argue that setting the IT strategy and paying for the messaging and hub services best sits with the shipper of the goods: the manufacturer or retailer. 3PLs and 4PLs subcontracting to other hauliers and messaging the data onwards would also pay. The recipient of the data would only pay for additional services, such as data storage or reporting, unrelated to their contracts with the shipper.

Future developments

As technology and communication costs fall, and there continues to be an increase in the tracking of vehicles and the goods themselves together with real time reporting of delivery performance, the quantity and scope of messaging between logistics partners will only increase. Geofences will increasingly be used to trigger messages and process steps. Integrated EDI will be the only way to incorporate real time information into dynamic transport planning and delivery management as well as for communicating changes to the plan back to stakeholders.

And having got used to the real time visibility of their main transport provision, manufacturers will expect the same visibility from collaborative partnerships. Interfacing to a single system, rather than expecting personnel to browse across numerous web screens, will be vital to success.

Moves by retailers to self billing based on goods receipt will change the process and the message type but not the need for interfacing with the manufacturer's system. Overall manufacturers will need to be flexible with their messaging to provide and receive different information for different customers and suppliers.

There will be an increasing proportion of 3PLs, 4PLs and even smaller hauliers with TMS systems which support product code level visibility and reporting; therefore direct system to system interfacing of POD information will become the norm for this market.

Lastly manufacturers, retailers and 3PLs will have the opportunity to create larger collaborative transport

networks where the pool of vehicles and orders within the transport planning and optimisation activity is extended across organisations for maximum vehicle fill. Like many opportunities the technology to do this already exists, and logistics industry EDI hubs will be an enabler, but the community co-operation required poses a greater challenge!

Summary

Modern day SaaS EDI providers can do more to enable sustainable distribution initiatives than simply pass messages electronically. By establishing and developing logistics EDI hubs they can make each integration work for many relationships rather than just one and thus bring integration into the realm of medium sized companies rather than just those processing tens of thousands of delivery orders. Such hubs can offer a range of value added services which can improve supply chain processes rather than simply automate them.

EDI hubs can also support manufacturers retaining or developing their efficient data exchange while working with new collaboration partners. The hubs can offer a range of established process and integration solutions to suit different business needs, thus reducing the process design effort of collaborative working particularly in multiple supplier environments.

Data from telematics is revolutionising the real time visibility of transport fleets, but these resources will never be planned to their full potential if delivery request data is not passed quickly and completely into the planning system. EDI hubs can provide an efficient way for transport data to be exchanged between shipper and carrier, giving the maximum available time for transport planning optimisation.

As sustainable distribution initiatives and real time information open up new opportunities and ways of working in logistics, EDI data exchange hubs will move from an optional technology to a necessary way of working. Expect them at a logistics operation near you soon!

About the Authors



Jo Godsmark is the founder of Supply Chain Design Company and a director of Labyrinth Logistics Consulting Ltd and leads their supply chain division. Formally a logistics buyer at Mars she has long been interested in haulier connectivity and how this can improve transport operations and supply chain processes.

For further information on Labyrinth's process design services please contact Jo at jogodsmark@labyrintholutions.co.uk, call her on 07760 178740 or visit Labyrinth's website at www.labyrintholutions.co.uk.



Ian Ford is Managing Director of First B2B Limited. In 2002 First B2B became the first company to offer an outsourced EDI service. To date the First B2B outsourced EDI solution has grown to over 1,200 live trading relationships, with over 2 million business documents exchanged each year.

For further information on First B2B's Software as a Service e-commerce solution please contact enquiries@firstb2b.net, call 01246 350000 or visit their website at www.firstb2b.net