



WHITE PAPER

Developing an IT strategy to meet the emerging demands in the Shipping and Freight Sector

An analysis of the rapidly changing trading environment in the shipping & freight sector – defining the information and communication needs and their influence in IT strategy

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Introduction

Over recent years the shipping and freight sectors have undergone unprecedented change and the marketplace continues to display the effects of globalisation, consolidation by acquisition, merger and strategic alliances, with a blurring of distinction between the traditional sector demarcations.

The net result is an exponential increase in the need to service the global market, to track and trace products over a much wider geography and provide high levels of customer service around the world

The trend continues for traditional shipping lines to extend services into logistics operations, even building door-to-door delivery capability. Companies previously described as logistics services providers are extending their offerings into the freight industry. The net result is an exponential increase in the need to service the global market, to track and trace products over a much wider geography and to provide high levels of customer service around the world.

The implications for IT systems as the supply chain becomes extended are:

- **The need to handle inter-modal movements.**
- **The ability to conform to different national legislation and customs requirements.**
- **A need for multi-currency and multi-lingual capability.**
- **A need for multi-time zones (allowing users to track global movements and transactions stage by stage all related back to their own time zones)**
- **Significantly more powerful database and data handling capabilities - necessary to provide a real-time, single view of goods as they travel across the world.**
- **The ability, cost effectively, to support low volume users in remote under-developed regions.**
- **To be able to make informed decisions, there is a need for strong integration capabilities between multiple organisations to provide visibility to the parts of the supply chain not directly under any single organisation's control.**
- **Track and trace capabilities to meet growing customer demand, plus a set of key events against shipments to generate alerts in the event of changes or problems.**
- **The ability to analyse data across offices and regions**

The purpose of this White Paper is to put the changing environment into perspective and to identify the resulting demands on IT systems (innovative ways to cut costs, to improve ROI and to provide new levels of customer service). We then go on to define an IT strategy designed to meet these new demands head on.

Industry perspective

Pace of change

If it had been possible to time-transport a Victorian shipping magnate to the industry in the 1970s, or even 1980s, apart from airfreight and containerisation, he would have recognised and felt remarkably comfortable with the fundamental *processes, documentation and types of companies* involved. Even today, much of the terminology is Dickensian – Bills of Lading, Manifests etc.

Then, over the last decade we have experienced a revolution, the scale of which it is difficult to over-stress. Information & Communications Technology have opened up novel concepts in trading and transporting goods. At the same time, these revolutionary ways of doing business have put new pressures on IT. It has all become a self-fuelling cycle. Let us spend a few moments reviewing some of the key changes:

Globalisation

Globalisation has become a significant factor in changing the concept of shipping. As an example, let us consider what is happening in Asia. Competitive pressures have squeezed margins and at the same time created a huge opportunity which the trading nations of Asia have grasped, emerging as some of the most innovative global suppliers. These countries are, in turn, benefiting from global trade to become considerable consumers themselves. The impact on the container shipping industry is significant with a stampede to capture the customer driven by larger ships and economy of scale.

It is estimated that by year 2015 the Gross Domestic Product of the Asia Pacific region will outstrip North America and Europe, followed by Latin America in the growth league. As we stated in our introduction, the net result is an exponential increase in the need to service the global market, to track and trace products over a much wider geography and provide high levels of customer service around the world. Clearly, the supply chain infrastructure that sufficed from Victorian times to almost the close of the 20th Century is dead in the water.

We are seeing that, rather than being a compartmentalised part of the chain, even small companies are becoming directly involved in shipping, air freight, road freight and so on. Organisations that were relatively local in their logistics operations are widening their offerings to provide new levels of distribution internationally. They are becoming more focused on freight and shipping, while

some shipping companies that previously restricted their operations to movement by ship, are now extending their service portfolio to door to door operations. This is evidenced by the trend for the large container carriers to own their own agency network, both to improve control over the customer while benefiting from revenue stream from inland haulage, inter-modal and freight forwarding operations.

The associated demands for up to date information mean that IT systems are having to be global in scope and they need to provide new levels of operational integration.

Partnerships and collaboration

It used to be the norm for companies to rely on their own resources for running their business and they guarded corporate knowledge jealously from their competitors. Today companies are waking up to the benefits of collaboration. They put value on the sharing of information with one another for mutual benefit.

Within the global transport and supply chain this means business partners sharing access to their *internal* systems in order to provide such data as delivery lead time, pipeline stock levels and product information. This extends to the need to support multiple channels to the customer e.g. booking via freight forwarders, via agents, via carrier web sites, or via links to freight portals such as INTTRA and GTN - all on demand.

The impetus for change came largely from the consolidators who, with the use of seamless IT (all on their own computer and Network) were able to deliver freight door-to-door across the world in 24 hours.

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The cargo 2000 consortium has been working on methods of reducing door-to-door air freight times by matters of days. They calculated that an air freight shipment typically took 12 days door-to-door and involved as many as 25 different companies during the shipment. By making processes changes and applying integrated IT solutions, the shipment can be moved in 6 days.

Applying similar collaboration and partnerships, utilising integrated IT solutions and networks, the shipping industry can start to achieve comparative levels of performance by air and by sea. The biggest challenge is a cultural one - opening up internal data and procedures to partners.

The second challenge is the increased demand on IT systems. To be able to make informed decisions, there is a need for strong integration capabilities between partners to provide visibility to the parts of the supply chain not directly under one element's control. Telephone calls and faxes, with yesterday's relaxed pace, won't

Partners are finding they need to create effective structures that align the functional operations of multiple organisations into an integrated system

wash any more – they are simply incapable of real-time communication of instructions between service partners.

In summary, partners are finding they need to create effective structures that align the functional operations of multiple organisations into an integrated system - focused on satisfying customers. Developing a collaborative culture is not a short term objective. It is a series of on-going joint ventures in which trust, commitment and the sharing of information and plans are essential.

Technology

For all the disappointments (and occasional successes) of the internet on business-to-consumer environment, its positive impact on the more structured business-to-business environment has been remarkable. According to Forrester Research, business-to-business trading over the internet will have grown from \$32 billion in 1998 to a staggering \$1.3 trillion by the close of 2003. Right now, the internet is the biggest single influence on the way we trade.

But the Internet has proved to be a disruptive technology - a technology that changes both the way we work and the economy in which we work. And this is true just as much for shipping as any other area of business.

It should also be recognised that the effects of the internet are much wider than just e-trading. Internet trading has changed peoples *perspectives*. Read any informed trade journal and the dominant issue when discussing the net is Customer Relationship Management. Customer expectations have changed overnight and the balancing of supply and demand becomes an even more critical process. Interestingly, the global access to products on the web opens up greater need for the globalisation of the transport and supply chain.

The Internet has also revolutionised remote systems deployment. For years companies struggled to implement operational systems at small sites around the world. The cost of communications, support and system maintenance was prohibitive, resulting in a proliferation of stand alone PC-based solutions. At a stroke the internet has demolished the cost barriers and the web is fast becoming a corporate communications infrastructure capable of supporting operational systems and providing the capability for carriers to deliver a corporate systems application and database

It allows the smaller niche carriers who operate on a global basis to compete with the same infrastructure and also provide a global integrated system

Not only does this allow the “mega” carriers such as Maersk Sealand to deploy a true on-line corporate system but also it allows the smaller niche carriers who operate on a global basis to compete with the same infrastructure and also provide a global integrated system

Industry response

Web-based solutions

FWL Technologies recently commissioned a survey of web trading by container shipping lines. The findings are probably consistent with other sectors of the industry.

We learned that companies are polarised – on one hand using the web as little more than a billboard, on the other offering an integrated system that allows business partners to perform key functions such as track and trace, bookings etc

With so much media coverage and with such obvious potential benefits, it was surprising to find such a disparate approach to this new route to market (even allowing for the complication of industry portals, such as INTTRA and GT NEXUS, agents providing a customer web-interface, or major high-volume customers using EDI). We studied container lines that make up 79.7% of the total world capacity (representing 5.3 million TEU, 2,337 ships).

The most common facility (and the easiest to provide if not maintain) is the ability to enquire into vessel schedules. Even this basic function was missing from 37% of sites.

The first lesson was that, not surprisingly, all lines have a website presence. The surprises come once you dig beneath the surface. There is evidence, for example, that even where an apparent transaction or enquiry facility exists, it is often not integrated with back office systems, which means out of date information and double keying of information between systems. The most common facility (and the easiest to provide if not maintain) is the ability to enquire into vessel schedules. Even this basic function was missing from 37% of sites.

A staggering 27% of shippers clearly had no web-based track and trace facility. It was not clear whether apparent facilities were linked to a central database in real-time or available on a global basis (different sites for USA, Asia and Europe).

The implications of track and trace facilities are significant – they add value for the customer and they significantly cut costs for the shipping line, deflecting what would otherwise be a welter of time-consuming telephone enquiries.

Nevertheless, a staggering 27% of shippers clearly had no such web-based facility. Of the remainder, it was not possible to ascertain whether their apparent track and trace facilities were linked to a central database in real-time. Neither was it clear whether the data was available on a global basis as many carriers have a different web site for say USA as opposed to Asia or Europe. How does the shipper get a consistent view. Some 27% of lines offer quotation request facilities, but again most appear to be missing the main point by not making this a near real-time transaction linked to the back office systems. The figure was 37% providing web-based requests for booking, though the caveat regarding back office links still applies.

Just a small number of companies are emerging as the movers and shakers

In some cases the lack of features may be off-set by web support on agents sites, but in the current competitive climate of staying close to customers is key.

Clearly, a company website is just one channel to customers, but a very important one nonetheless. The real message is that there is everything to play for in terms of customer service and just a small number of companies are emerging as the movers and shakers.

Front-end obsession

Despite the fact that the industry is quite mature in terms of electronic data interchange (EDI), its response to the internet, as our research revealed, has been disappointing.

Too much attention has been devoted to front-end solutions without thought to the back office, the engine that drives the business. The dot.com boom was an example of front-end systems going nowhere, with the dot.coms doing exactly the same.

For many companies, the cost of re-writing internet-enabled systems has been prohibitive and has delayed the inevitable. The 'inevitable' being systems that bring benefits such as operational savings, inventory savings, faster deliveries and better planning – consider the implications on the management of container stock and empties.

Disparate systems

Our research has also revealed that companies are still relying heavily on disparate systems (a mixture of legacy systems and the fad for 'best of breed' solution modules) loosely connected and with little integration with the outside world.

Compare this with manufacturing and retail companies, where huge steps in terms of integration have been achieved. When a supermarket till records an item sold, information goes straight into the ordering and planning cycle for the next delivery truck, often involving multiple systems spanning retailer, manufacturer and a third party logistics company in the middle.

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For most container carriers, the data captured in a customer booking is not automatically linked to container planning systems, voyages recording and the inland movement of cargo.

Another way of reading this message is that for any organisation willing to make the effort, there is everything to play for

Everything to play for

The message, then, is that few companies in the shipping and freight arena have really grasped the nettle. Most are not yet benefiting from the leverage the internet can provide, few have truly integrated systems capable of providing the real-time information customers yearn for and few are able to integrate systems with trading partners.

Another way of reading this message is that for any organisation willing to make the effort, there is everything to play for.

Defining an ideal solution

First, let us get one thing straight. There will never be an ideal solution. Time marches on. It is possible, however, to define a solution that meets all of today's needs and foreseeable requirements to stay ahead of the pack. By choosing the right IT infrastructure, it is also possible to insure against almost all the current imponderables.

In our opening section, we outlined the key demands on IT systems as:

- **The need to handle inter-modal movements.**
- **The ability to conform to different national legislation and customs requirements.**
- **A need for multi-currency and multi-lingual capability.**
- **A need for multi-time zones (allowing users to track global movements and transactions stage by stage all related back to their own time zones)**
- **Significantly more powerful database and data handling capabilities - necessary to provide a real-time, single view of goods as they travel across the world.**
- **The ability, cost effectively, to support low volume users in remote under-developed regions.**
- **To be able to make informed decisions, there is a need for strong integration capabilities between multiple organisations to provide visibility to the parts of the supply chain not directly under any single organisation's control.**
- **Track and trace capabilities to meet growing customer demand, plus a set of key events against shipments to generate alerts in the event of chnages or problems.**
- **The ability to analyse data across offices and regions**

According to IT market research company Meta Group, the world's top 2000 companies on average rely on 49 core applications and spend up to 30% of their IT budget getting them to talk to each other

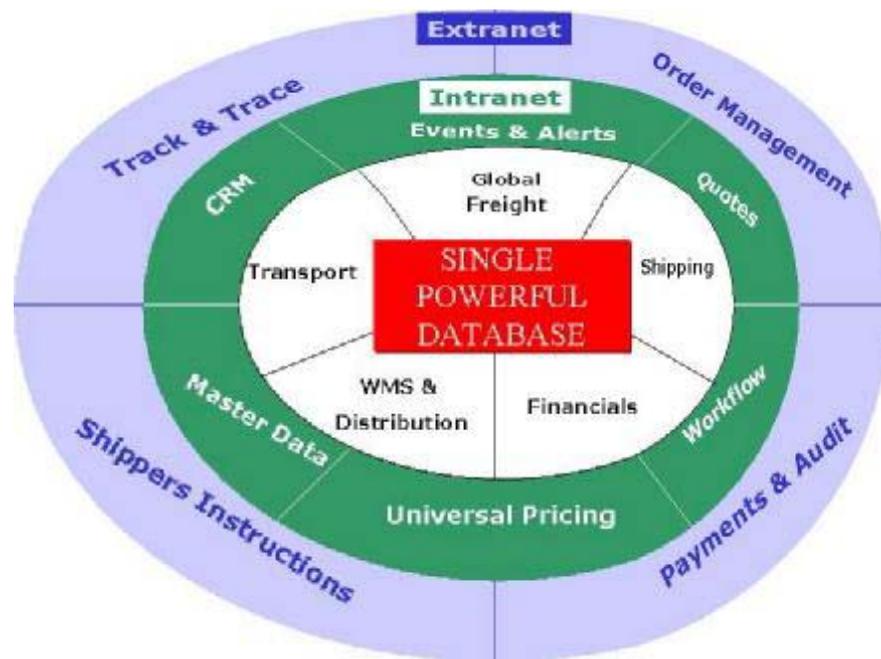
Integration, integration, integration

From demands outlined above, a number of messages emerge. The first three messages are clear – integration, integration and integration. Lack of integration leads to an inability to plan effectively, to communicate internally and with business partners, plus an inability to leverage key customer-facing applications such as track and trace.

This view is underscored by the definition of a utopian state for any company as defined by IBM's chief executive, Sam Palmisano : *“Process integration end-to-end across the company and with key partners, suppliers and customers – providing the ability to respond with agility and speed to any customer demand, market opportunity or threat.”*

Integration, then, not in the traditional sense of internal systems, but end-to-end integration from back office systems through intranets (for customised flows and events, internal to company users) to extranets (external party access, such as customers, ports etc) complete with an e-commerce front end.

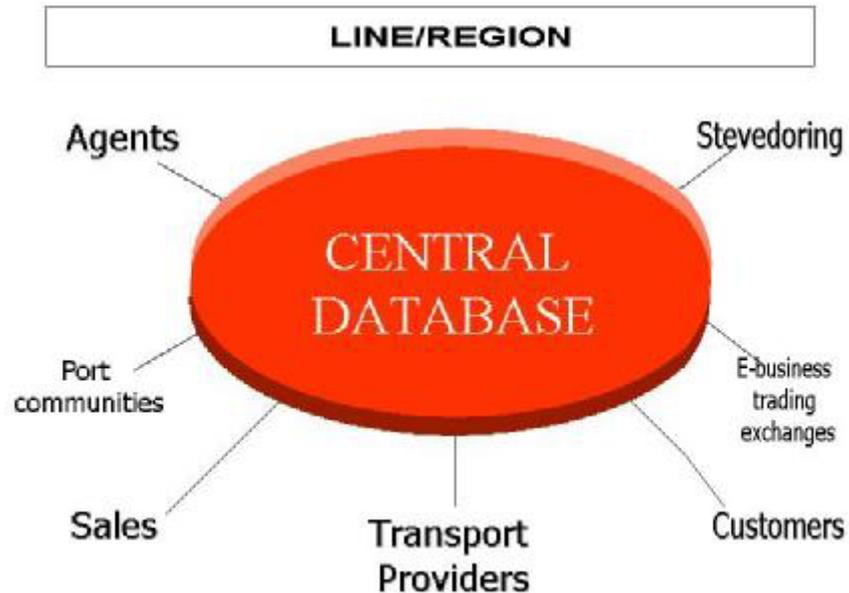
Diagrammatically, an ideal solution would look something like this:



In this model the e-commerce front end is linked integrally with shipping, freight forwarding, warehousing and distribution systems - plus strong integration capability with external systems such as those at Ports. The islands of information in a traditional set up, with a head office database and a database at each agent, can be eliminated to give a consistent view to the carrier and more importantly to the customer.

Single, central database

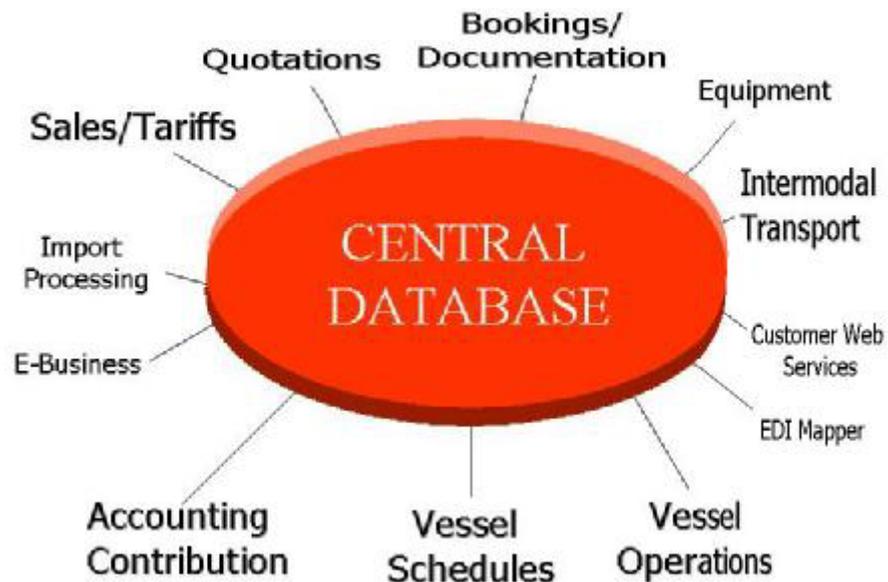
Let us explore further the compelling arguments for a powerful, single central database:



In the diagram above, users around the globe have real-time data access, with systems management benefits:

The islands of information in a traditional set up with head office database and a database at each agent can be removed to give a consistent view to the carrier and more importantly to the customer

- No need to manage databases at each site
- No need for interfaces for data on a batch basis
- No need to translate or map codes
- Control of customer database
- Reduction in duplication of data
- More control over similar customer requests to different offices
- Presenting a consistent view to customer worldwide.



Now let us examine some of the significant gains and opportunities for process re-engineering that can be achieved by having a central database and integrated modules. As our example, let us take a company with booking agents in ports throughout Europe. If all their data is entered into a single database, then the company needs just one location to process back office tasks such as documentation. Similarly, for each port agent there need be just one location that manages container stocks and movements.

For inland transport, a single location is able to manage and review all transport requests, matching trucker/hauliers to an outbound and inbound delivery, again saving costs. The single database allows information easily to be shared across all modules: quotations, bookings, equipment control, intermodal, documentation.

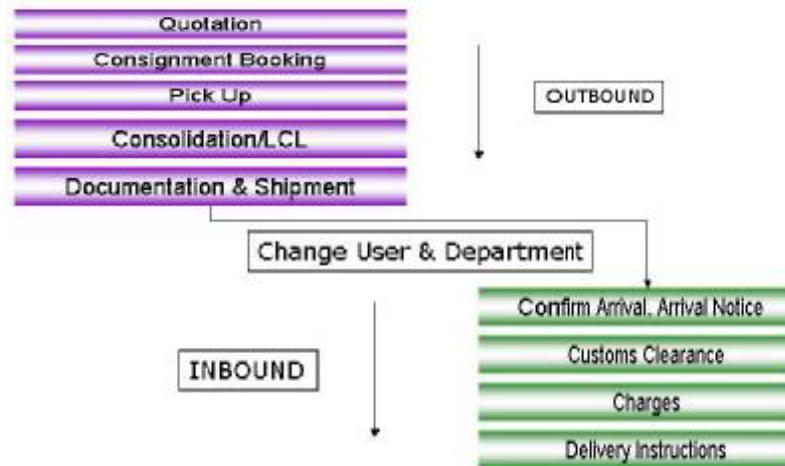
The benefits:

- **Once-only entry of data**
- **Reduction in errors**
- **Faster turnaround of questions and queries**
- **Shorter time to complete shipment process**
- **Reconciliation all data prior to port call closure**

Complete visibility of all information in the central database, allowing head office view of the live operation enables:

- **On line tariff/quotation approval**
- **Real time booking summary vs allocation**
- **Real time view of contribution**
- **On line OOG, HAZ approvals**

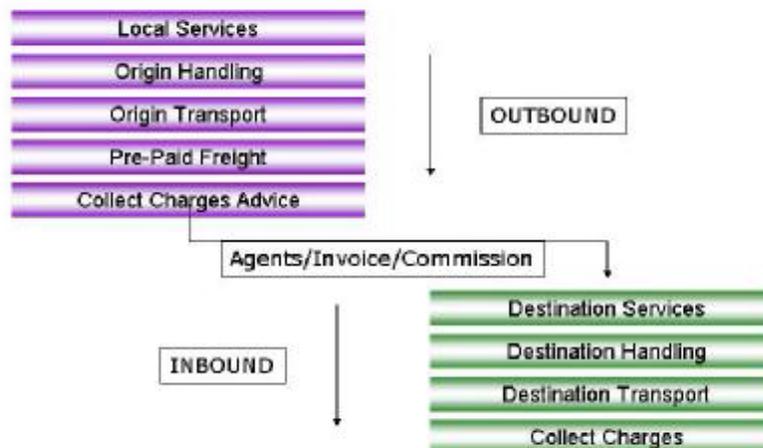
One File Processing End to End



Employing a single file concept means that bookings entered by the export office are immediately available to the import office, with obvious benefits:

- **Import office visibility**
- **Access to data at the import office (subject to security checks)**
- **Enhanced customer service due to information being available earlier**
- **Fast import processes due to earlier availability of data**
- **Reduction in transcription errors**

Cost & Revenue Reconciliation



Continuing this argument – at each point during the processing of a transaction, cost or revenue data can be written to the central database relating to the shipment. Then a profit/loss analysis could be made against each shipment / route / voyage.

Since the database is central and up to date, data is significantly closer to real time. In most carrier IT systems this data is captured weeks and months after the event, when agents report back to the central system.

Such techniques are used extensively in the airline industry to price aircraft space based on demand, as well as being used in the ferry industry

With up to date information, carriers can react more quickly to trends. It is also possible to use this data, together with container and booking forecast data, to apply stronger revenue management techniques, such as using data analysis to determine whether a booking should be taken or not, and if so what price to sell. Such techniques are used extensively in the airline industry to price aircraft space based on demand, as well as being used in the ferry industry. The container shipping industry has yet to leverage such control.

Web deployment

Web exploitation offers so many advantages in the form of deployment flexibility. Essentially, users need only an internet connection and a PC to gain access. In summary, infrastructure benefits include:

- **The older client server model, with a difficult technical implementation is no longer required.**
- **No local data or IT infrastructure to maintain.**
- **Access for sales and to operational staff ????**
- **User confidence (less training) from familiar browser access**

Effectively, this translates into allowing management to concentrate on running the business, rather than managing IT issues.

In many cases, smaller carriers should even be able to outsource the running of the central server to a third party, gaining 'big company' systems benefits without the technical overheads.

Extranet integration

The Extranet layer in diagram (number^{???}) would allow customers (following a secure login) to interact with on-line global data. This should include the ability to enter shipper instructions and print draft and original bills of lading - a major time saver for carriers as telephone calls, faxes and queries can be reduced when customers are able to access and carry out these tasks for themselves.

A properly designed extranet that is integrated with back office systems can allow customers to employ an 'alert' management style, rather than a reactive track and trace model

As well as providing access to relevant data, a properly designed extranet that is integrated with back office systems can allow customers to employ an 'alert' management style, rather than a reactive track and trace model. Shippers should be able to define their own workflow, milestones and alerts that are relevant to the running of their business. In the new world of the supply chain customers will insist that information is provided in their own specific format.

Allied with commercially available query tools, it should also reduce customer queries and telephone calls.

Conclusion

Defining an IT strategy

From the discussion above, it is possible to draw up the elements of an IT strategy to meet the emerging demands in the shipping and freight sectors. In summary, it would have the following features:

A seamless product, spanning the supply chain can accommodate structural industry changes

Breadth of application span – the changing nature of the industry (mergers, extension of services offered, blurring demarcation between operators along the supply chain etc) makes it difficult for any one player to predict precisely the shape of their company even five years from now. The secret, then, is not simply to address the organisation's current commercial activities. Ideally, a solution should be selected from an application provider who supplies linked solutions across the supply chain including, specifically, warehousing, shipping, freight forwarding and intermodal transport. This is the only sure route to ensuring the flexibility to exploit emerging trading opportunities faster, without risk and costs of future systems replacement

Consistency of applications – there is a very real need avoid the tyranny of disparate solutions (patching up legacy systems one year, adding stand alone fixes another, adopting a cosmetic front end, and so on). There is a compelling argument for adopting a single supplier route, where the supplier can provide a range of consistent, integrated application modules. Not only does this result in smoother implementation, it also means lower on-going support costs. The real imperative for adopting this strategy, however, is to ensure data consistency, end to end, opening up the potential of open systems between trading partners and their customers.

Powerful, single, central database – the new world of real-time data access around the globe requires a powerful database technology, complete with supporting data manipulation techniques. The decision, here, has been simplified by the industry's adoption of Oracle database technology as its *de facto* solution.

Extranet - The air freight and courier sectors have demonstrated the commercial arguments for providing supply chain visibility, while structural changes in the supply chain are creating a 'virtual community'. An extranet, fully integrated with back office applications is the only viable route to exploiting the benefits of this

According to Nobel prize-winning economist Ronald Coase, the time people and companies spend searching, co-ordinating and checking whenever they exchange goods account for one third of the cost of all economic activity

community. The biggest single benefit is the effect on interaction – the time people and companies spend searching, co-ordinating and checking whenever they exchange goods. According to Nobel prize-winning economist Ronald Coase, costs of this kind account for one third of all economic activity. When evaluating potential software solutions providers, therefore, it is essential they can address both back office and extranet needs, complete with full integration.

Integration – A consistent message throughout this document has been this need for integration, integration, integration – both internally and with business partners. Cost of getting core systems to talk to each other accounts for a staggering 30% (The Meta Group). Return on investment in pre-integrated solutions can ensure a systems payback within xxxx.

Appendix – FWL Technologies and its solution

Appendix – The Oracle contribution