Business to Business e-commerce
Investment Perspective
BTB e-commerce: Investment Perspective

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Appendix: European Trading Communities

- AUTIF
- Band-X
- Build-Online
- ef dex
- eLOGISTICS
- ENX
- e-EXchange
- Hyporium Trading Hub
- Pefa.com
- Systemcare/Requisitions.com
- TradeNetOne

GLOSSARY

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INVESTMENT HYPOTHESIS

Durlacher believes that significant opportunities in emerging technologies and media over the next few years lie in the areas of convergence between networks/communications, content/media and IT/software. These spaces are generating churn, new ways of trading, new players and new revenue streams. Convergence within sectors tends to extend functionality, whilst convergence between these different sectors offers the opportunity for the development of new services that change the trading landscape. Within the BTB e-commerce space we can map investment opportunities onto this model as follows:

Over the past five years we have seen the growth of enabling infrastructures and e-commerce applications that quickly and demonstrably increase efficiency by streamlining existing trade processes. This involves organisations who are offering IP based infrastructures (IP VPNs) and internet based applications (buy-side, sell-side, middleware, supply chain) replacing existing paper, phone, fax and EDI networks. The most successful organisations have been those that address the most inefficient sectors, for example the e-procurement application vendors (Infobank, Commerce One), who have focused on the buying of maintenance, repair and operations (MRO) in large organisations. The limitation of having these separate offerings lies in the restricted extent to which separate players can reduce costs.

The second wave of investment has built on the first by extending convergence between sectors. This has seen the growth of centralised hosting facilities, content distribution, e-commerce application service providers (ASPs) and online trading communities. These players are helping to centralise content, bring together fragmented industries and extend e-commerce functionality into smaller organisations through offering network based e-commerce applications as a service. At the same time trading communities are helping to build market efficiency and scale whilst opening up competition and the ability for businesses to trade in new ways (auctions, exchanges etc). In addition e-commerce applications are being wrapped with content and offered as a value added service. As an example VeriSign
(digital certificates etc) has linked up with Dun & Bradstreet (company database) to offer a secure online company credit checking service.

We believe that the market efficiency and scale achievable through existing online trading communities will be extended through further convergence. Longer term opportunities will lie with companies who can provide value added trading solutions that extend reach into more of the value chain, for example trading exchanges are likely to extend their offerings to include settlement and fulfilment capabilities. In addition, the next generation of BTB e-commerce trading communities and BTB e-commerce solutions, will include information, collaboration technology and services that enable companies and suppliers to trade in new ways by addressing the issues of what you should buy, who you should buy it from, what price you should pay, when you should buy and where.

In a broader sense it is our view that the software and services discussed in this report will merge with other parts of the offline supply chain as well as with the existing enterprise software market, and those areas we currently see as discrete areas e.g. knowledge management and business operations will all become part of what already is being identified as e-business.
HIGHLIGHTS


• The existing offline BTB market is dominated by large established players and strong sector based relationships. The key opportunities for new entrants will be in areas that address inefficient sectors of the existing BTB commerce market currently dominated by paper, phone and fax based trade.

• Companies looking to move into the BTB e-commerce space will need to have a deep understanding of existing business processes. This will require partnerships with SI’s, management teams with a clear understanding of the drivers behind BTB commerce, and significant knowledge of the specific industries being addressed.

• Re-intermediation as opposed to disintermediation strategies will work better in the medium term because of the presence of existing industry structures and the strength of key participants. A growing proportion of BTB trade will shift from direct supply, to buyer trade, and on to intermediaries.

• The BTB e-commerce market will support the emergence of clicks and mortar companies, as opposed to pure internet based companies.

• A variety of large established companies are starting to enter the BTB e-commerce market including software vendors (Oracle, SAP), content/service providers (Dun & Bradstreet, Reuters), large distributors (VWR Scientific Products entering the trading community market with Chemdex). Start-ups looking to enter the BTB online intermediary market will need to get big, niche, or get out.

Application opportunities

• Although application platforms are becoming functionally rich and sophisticated, the need for flexibility in the BTB e-commerce environment means that system integration skills will remain an important component of any sale into larger companies.

• We expect that many e-commerce application vendors will partner or acquire SI’s and work with hosting companies to offer commerce applications as services into the SME and inefficient sectors of the enterprise market.

• The focus of BTB e-commerce application software will shift away from sale of narrowly defined commerce platforms to the provision of a broader range of services for managing customer relationships. This will involve the convergence of customer relationship management systems (Siebel) with pure-play e-commerce applications (Broadvision, Vignette) and supply chain applications (Manugistics and i2).

• Durlacher expects consolidation across sell-side applications as vendors compete to add functionality. We also expect to see further partnerships between e-commerce vendors and off-line players (telesales, recruitment, call centres) to extend functionality across the whole enterprise.

• We believe that the buy-side application (e-procurement) market is large enough to accommodate several winners. These will address different types of procurement including transactional, strategic and spot buying activities, each of which require different buy-side solutions. In addition we believe buy-side application vendors will increasingly focus on particular industry sectors.
Intermediary opportunities

• BTB e-commerce will increasingly take place through intermediaries. Durlacher estimates that $8 billion in goods and services will be traded through intermediaries in the Euro-15 over 2000, growing to $407 billion or 32% of all BTB trade by 2004.

• The key initial commerce opportunities for trading communities are in spot buying (purchasing of goods based on market prices rather than long term contracts) and strategic sourcing.

• There will be a rapid growth of trading communities driven by large industry players. In the medium term, neutrality will play an important role in driving marketplace liquidity and will encourage the growth of third party marketplaces in fragmented industries, as well as spin-offs from large players in consolidated industry sectors.

• First mover advantage is less important in BTB than in BTC. Scale, domain expertise, service quality, valuable content and industry understanding will be the key factors in determining winners.

• Buyer centric strategies will prevail as buyers have access to more transparent markets.

• Transaction based revenues will move from flat fees based on value-add arising from cost savings, to flat fees based on support for a greater number of business documents (purchase orders, invoices etc) and a greater number of functions and services. Transaction based fees will vary widely between industries and by company especially in the short to medium term.

• Transaction based revenue will take longer than expected to reach critical volumes. However once critical mass is achieved they will produce high returns for a small number of successful companies who can continue to extend functionality and add value.

• Advertising rates will be higher than in the BTC space but will be a secondary revenue stream behind subscriptions, content sales and transactions.

• We believe that the trading community market will undergo explosion, consolidation and restructuring and that successful trading communities will increasingly interoperate together to form what will amount to a global trading web of industry specific trading sites.
METHODOLOGY

Research for this report commenced in May/June 1999. Notwithstanding the pace of market development, we have published this report with the intention of providing industry players, investors, BTB e-commerce service and equipment vendors, and others in the B2B community, with a pragmatic view and analysis of the BTB e-commerce market. We have also made our best efforts to forecast how and when this market will grow in Western Europe, and outlined the applications, services and business models that will drive adoption.

The report does not aim to provide an exhaustive overview of the BTB e-commerce market place or the enabling technologies. In particular it should be noted that we explicitly exclude in-depth analysis of any of the enabling infrastructures and technologies outside of our analysis of the BTB e-commerce value chain. Other market reports and technical documents are available that fulfill this role.

PRIMARY RESEARCH

Over the past ten months, we have conducted original research and interviews across Europe, and have exchanged ideas with many operators, equipment vendors, application vendors, content providers, system integrators and trading communities.

We have built a view on the market that makes a realistic assessment of the true size and timelines of the BTB e-commerce opportunity. Our understanding of the relevant developments in this particular segment has been shaped through discussions with numerous industry leaders.

However, the market is just being created. In such a new marketplace, it is almost impossible to extrapolate long-term trends from an early, developmental snapshot.

SCOPE

Definition of BTB e-commerce

For this report, business-to-business e-commerce is defined as commerce conducted between businesses over an intranet, extranet or internet (i.e. IP networks). This trade may be conducted between a business and its supply chain as well as between a business and other business end-customer. BTB e-commerce may be conducted directly between buyer and seller or through a third party, who we will refer to as an online intermediary.

The report is focused on the investment opportunities in the applications that enable trade as well as the communities that have been built up to better service current trading relationships. The report aims to give a Western European view of global BTB e-commerce developments with analysis on how BTB e-commerce may emerge in this region over the next 5 years.
BTB e-commerce Definition

Note: BTB e-commerce can be conducted at any point in the existing supply chain either to streamline existing processes or to disintermediate parts of the process.
MACRO ECONOMIC TRENDS
SHAPING BTB TRADE

The environment in which business organisations operate is being transformed by a number of drivers. The most important include:

- Globalisation of the world economy, which is leading to increasing interdependence of markets and industries.
- Changing role of government as it withdraws from direct intervention in economies and instead acts as an economic manager. This has created new privatised industries but is also changing the nature of competition in many markets.
- Older, wealthier but more informed and demanding consumers.
- Changing structure of markets. Many market boundaries are blurring because of changing barriers to entry, resulting in the need for alliances.
- The move to dynamic supply chains, modularisation of business processes, and the trend towards ever changing networks of buyer / supplier relationships.
- Widespread adoption of readily available, easy to implement IP infrastructure by global business.

Underpinning these changes is an accelerating rate of technological innovation. This is occurring across a range of technologies but information technology is having the greatest impact on business organisations.

THE FOCUS OF BUSINESS TECHNOLOGY IS SHIFTING

The focus of information technology within organisations has shifted over the last thirty years from improving the efficiency of business processes within organisations, to improving the effectiveness of the whole value chain. During the 1960s and 1970s, businesses focused on the use of mainframes to process large quantities of data. In the 1980s business focused on using personal desktop computers to improve personal efficiency. The last decade has seen the use of technologies to create electronic networks within and between organisations.

The implementation of Enterprise Resource Planning (ERP) and e-mail systems during the 1990s allowed individuals within organisations to communicate together and share data. This brought some productivity gains, particularly when allied with business process reengineering and shared service centres. Probably their most significant advantage was in the enterprise wide view of a business that ERP systems allow. However, ERP systems have a number of disadvantages. Apart from being costly and difficult to implement, they are inflexible and lack integration to the systems of other organisations within a value chain. This means that only some benefits from networking technologies were captured.

The current focus of large commercial organisations is on integrating ERP and other systems with those of an organisation’s suppliers and customers. Value chain integration allows networks of customers and suppliers to reduce costs, for example by eliminating duplication. In addition, it improves effectiveness, for example by allowing the closer matching of demand and supply. These macro drivers are resulting in significant changes in the way companies are organised, relate to each other and create value.
TRANSACTION COSTS

The pioneering work of economists in the 1930s demonstrated that the scale and scope of commercial organisations was primarily determined by the relative costs of making products internally compared with buying them from another party. Three transaction costs determine the outcome of this calculation.

1. Search and familiarisation costs i.e. the opportunity cost of the time needed to locate a supplier and conduct due diligence. Traditionally, this has been time consuming, for example attending trade shows and obtaining trade directories.

2. Bargaining costs i.e. sending out invitations to tender and obtaining information on prices and service levels.

3. Coordination, policing and enforcement costs. These historically have been the most significant transaction costs. They include the direct cost of supervising contract performance through to the accounts payable function.

The size of transaction costs should not be underestimated. In the US for example, it has been estimated that up to one third of economic activity is tied up in transaction activities and over half of all labour activity (McKinsey estimates).

In practice, high transaction costs have meant the most efficient way to produce goods and services has been through large organisations. These were traditionally hierarchically organised using large numbers of staff to coordinate activities. Generally each entity was distinct within their industry value chains, for example there were clearly defined boundaries between them and their customers and suppliers. Only limited information was shared between companies.

THE RISE OF VIRTUAL CORPORATIONS

The growth of outsourcing in the 1980s was the first signal that the traditional hierarchical corporate model was breaking down. However, the first phases of outsourcing generally dealt with relatively simple products and services, for example groups of components and building maintenance. However, there was a natural limit to the impact of outsourcing because of the continuing existence of transaction costs, notably those involving the coordination of activities between organisations.

Recent development of networking technologies that allow organisations to be integrated electronically has significantly reduced the costs of transactions. This trend is being driven by a number of drivers:

- Business to business transactions are increasingly conducted electronically through the use of computer networks. Fax in particular is becoming relatively less important.
- There is a continuing shift away from developing proprietary systems to those based on open systems, in addition to the continuing move towards platform independent software.
- Technology is moving towards operating at near real time or ‘zero latency’.
- The increasing emphasis on distributed computing or getting applications to operate together across different computer systems in a standardised way.

This means that organisations are able to focus on their core activities and buy in non-core products and services. The result is the growing importance of small and medium sized enterprises (SMEs), falling average company sizes and a macro shift to market based economic coordination. The logical result of these trends is the rise of virtual corporations, and online trading communities.
THE ORGANISATION OF THE FUTURE

Although it is difficult to accurately predict the future of the firm, we believe that the trend points towards increasing specialisation and smaller companies that are fully integrated into dynamic networks of customers and suppliers. In reality this will mean that industry value chains will be reconfigured so that organisations provide only a small number of activities within their ‘core competencies’. We believe that these will include brand holders who manage marketing, specialist product developers, manufacturers who will produce for a number of different customers on a batch basis, ASPs providing IT across the network, information brokers for example trading the availability of batch capacity and a virtual supply chain that is not dedicated to any single manufacturer/retailer.

These organisations will have the following features:

• Highly responsive - firms coming together in temporary partnerships for specific activities, for example to design and develop a service. After the completion of the project the partnership will be dissolved.

• Focused - the organisation of the future will focus on its area of specialisation, for example design or information broking.

• Flexible - Many activities that are currently controlled by a single firm will become openly traded, for example call centre and factory capacity. In addition, supply chains that currently service one industry will be shared across a number of industries.

• Transparent - Information will become transparent within a network of organisations, for example the accounts payable function will decline in importance.

• Lean and efficient - The organisation of the future will have minimal internal processes, in particular those associated with the coordination of activities. For example, invoice processing will become automated.

• Real time - Many activities will be undertaken in real time, for example concurrent engineering design and build-to-order.

![The Organisation of the Future](image-url)
TODAY’S MARKET

Size of BTB Trade

Transactions between businesses today amount to around $80 trillion globally according to the US Census Bureau. Of this, business-to-business transaction value far outweighs business-to-consumer, accounting for roughly 85% of the total or $60 trillion. In Europe, BTB trade has similar importance totaling around $14 trillion or 77% of total transaction value.

Market evolution

Business-to-business electronic trade has come through a number of phases with each new phase driving development in the next. The first of these was the growth of electronic data interchange (EDI), which offered closed, expensive, proprietary networks between big buyers and their largest suppliers. This was followed by the global rise of the supplier driven company websites, mainly used for marketing, with more sophisticated sites offering e-commerce. In order to increase sales opportunities buyers have demanded applications that helped to streamline the selection, internal permissions and ordering of suppliers’ goods and services.

Traditional buyer and supplier models have been limited in scale and have displayed only partial efficiency in terms of market economics therefore giving rise, over the past 18 months in Europe (3 years in the US), to the growth of online trading communities. These communities are leveraging existing BTB applications and technology and new internet based business models, in order to streamline trade between multiple buyers and suppliers, in existing communities or wider industry sectors. These capture significantly more benefits than buyer and supplier models.

Figure 4. Source: Durlacher
This market evolution in turn has resulted in different waves of investment opportunity starting with enabling infrastructures and applications to streamline existing trade, followed by the migration of applications and value added services into the network and the growth of trading communities and online service providers. Consolidation is already underway at the infrastructure levels and we believe that the next big opportunity for investors will lie in the converging sectors around BTB e-commerce applications, content and trading communities which form the basis of the discussion for the rest of this report.
BTB E-COMMERCE DRIVERS

Growth of internet connectivity in the business sector

Technically the European internet market is ripe for e-commerce. The number of businesses connected to the internet has grown dramatically. Currently 28% of all European companies have some form of internet connection with this growing to around 67% for large organisations (>500 employees). More recently in Europe this has been coupled with the growth of in-company internet penetration through higher speed access and build-out of extranets and intranets. This was confirmed in Durlacher’s 1999 corporate and SME surveys which indicated that internet access within UK organisations has reached 50% in corporations, 43% in medium sized companies and 34% in small companies. An increase in the number of internet enabled companies, coupled with a growing number and range of internet enabled employees, rapidly increases the total number and the range of possible commercial transactions.

<table>
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<th>Table 1: Business internet penetration: Europe</th>
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<tr>
<td><strong>Total European white collar workers (m)</strong></td>
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<td>Total European white collar workers (m)</td>
</tr>
<tr>
<td>106 107 108 109 109 110</td>
</tr>
<tr>
<td>White collar employees with internet access (m)</td>
</tr>
<tr>
<td>42 53 58.9 64.8 70.9 77</td>
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Source: Morgan Stanley

Increased market and product liquidity

Small companies have not traditionally benefited significantly from online business services, automation and electronic trade. In Europe, large companies account for 36,000 of a total of 18 million companies (Source Eurodat). We believe the internet will begin to level the playing field with small businesses projected to make up a growing proportion of total online sales. Moreover the internet is an increasingly global network allowing businesses to reach customers and suppliers in new areas. Reach into smaller businesses coupled with international expansion rapidly increases the number and types of BTB trades that are possible.

The global reach of the internet also opens up the possibility for businesses to sell more of their products across all of the goods lifecycle (raw material, finished goods, second hand goods, scrap etc). Many of the inefficiencies in current BTB trades are the result of companies being unable to find buyers for specialised goods or services (medical equipment), time sensitive goods (return loads, advertising space), second hand goods (used cars) or excess inventory (paper).
Dynamic Trade
The growth of the internet has enabled more buyers and sellers access to each other, which in turn is allowing demand to be more closely matched by supply. This generates a greater degree of pricing transparency and competition and a shift towards demand rather than supply driven trade. In the BTC world dynamic trade has been introduced by mass-market players including eBay offering auction functionality. In the BTB world auction and exchange trading mechanisms are being introduced through online trading communities. Even in cases where this type of functionality is inappropriate (for example machine tools) the low cost of communications facilitated by the internet allows companies to obtain quotes from a wider range of suppliers.

Cost savings
BTB e-commerce promises significant savings in the procurement of direct and indirect goods and services. Smaller buyers can club together to negotiate better pricing and sellers reduce the cost of finding new customers. Both parties benefit from lower administration costs generated through time savings and the reduction in staff numbers.

Cost efficiencies in direct procurement (purchase of products that feed directly into the production process) have been streamlined in many of the larger organisations through the implementation of expensive enterprise resource planning systems (ERP). Indirect procurement (purchase of goods and services used in peripheral maintenance, repair and operations) has tended to be less streamlined and therefore more inefficient. According to the Centre for Advanced Purchasing Studies, indirect goods account for over a third of all costs to a business rising to 60% in service companies. A small reduction in indirect costs therefore has a direct impact on a company’s bottom-line.
Big company push
BTB e-commerce is being driven by large companies (typically large buyers) who are increasingly forcing all their suppliers to trade electronically and smaller suppliers in turn are looking to the internet to make this a viable alternative to traditional EDI networks.

Improved customer service
As we move from a product driven to a service driven economy companies are increasingly looking to the internet to offer improved customer service at low incremental cost. Examples of this include the tracking of parcels, tax calculations, comparison services for air freight or 24x7 access to information on goods and services.

Increased speed of transactions
BTB e-commerce has the potential to streamline existing transactions by speeding up a number of parts of the existing procurement chain. Some of these include:

- Improved ability to find companies and products through search engines, auctions, exchanges.
- Online credit checks such as that offered by Ecclerate.com
- Online bill presentation and payment
- Digital fulfilment, and digital tracking of non digital product
COMPONENTS OF THE BTB VALUE CHAIN

The BTB e-commerce landscape can be roughly divided into e-commerce enablers (carriers, hosting providers, security vendors and technology platform vendors), service providers (application vendors, content providers) and trading communities, with system integrators providing the glue at each stage to either integrate technologies or re-engineer businesses processes around new BTB technologies and online services.

CARRIERS

Europe’s current internet infrastructure owners and operators include telecoms operators (BT, France Telecom, MCI Worldcom, Deutsche Telekom), alternative network operators (Mannesmann, Viatel, Cegetel, Level 3, Qwest, Colt) and large internet service providers (PSInet, Planet, World Online, EasyNet). These organisations are in the strongest position to provide Europe’s commerce base infrastructure. Alternative carriers and large US telcos have addressed the limitations of national PTTs at the infrastructure and transport levels by building high speed, IP based networks linking Europe’s major business centres. Unlike the established PTTs, these companies are not being held back by investments in legacy infrastructures and are in a strong position to benefit from the predicted ramp-up in demand for backbone capacity driven by the rapid increase in the volume of machine-to-machine communication and the rise of multimedia traffic.
In addition, these companies are building out the capability to offer businesses an alternative to expensive value added networks (VANs) for running BTB trade through extending their offerings to include IP virtual private networks that offer 99.99% availability and increasing guarantees for latency and security, within an operator’s network.

We believe that over the next three years major established electronic data interchange (EDI) based trading communities will migrate to an IP based infrastructure for reasons of cost. The companies who can best offer reach, quality of service and attractive pricing will be the major beneficiaries of this migration. Large vendors will retial this infrastructure to large enterprises (e.g. AT&T’s $350 million deal with General Motors for an IP VPN solution connecting 1,100 locations in over 40 countries) as well as wholesale services to Application Service Providers (ASPs), ISPs and hardware manufacturers who will address the SME sector of the market.

More recently, infrastructure companies have started to streamline their offerings to address vertical sections of the business market. An example of this is the recent joint venture between Equant and Reuters to offer financial services firms a secure global IP network. The new company, owned 51 percent by Reuters and 49 percent by Equant, will have up to 600 staff and annual revenues of more than $400 million and is expected to turn a profit within 2 to 3 years.

European telcos are leveraging their dense in-country networks to build out national IP infrastructure offerings. In addition, telcos are offering managed network infrastructures that enable the exchange of XML documents over IP networks to support trading communities and business sites. An example of the former is E-procurement vendor Commerce One’s European partnerships with BT, Deutsche Telekom, Portugal Telecom and Swisscom to operate hubs for the trade of maintenance, repair and operations goods and services. Carriers benefit from their experience in the managed extranet space, central management and facilities, technical support services as well as relationships with suppliers in the MRO space. Carriers are also looking at providing commerce platforms for individual businesses for example France Telecom and Telia, with the latter offering a payment gateway service into all of Sweden’s major banks and charging a commission on every transaction.

CONTENT HOSTING

The webhosting landscape in Europe is very competitive with market entrants coming from the hardware provider sector (HP, IBM, Compaq, Intel, SUN), network provision (Qwest, Level 3, Colt), Telcos (DT, FT, BT, Telia), ISPs (PSINet, Verio, Planet, World Online, Easynet), dedicated hosting providers (Exodus), Datacentres (Debis Systemhouse) and traditional LAN vendors (Madge). These companies are offering a mix of dedicated, colocation and shared hosting facilities targeted at different sectors of the market.
In order to differentiate their services and add value many of the larger organisations are developing a number of additional content services through a combination of partnerships including audio and video streaming, design and consulting, hosted transaction services, security services in partnership with PKI vendors, statistics and reporting services, consulting and business re-engineering and back office fulfilment.

We believe that many of the hosting providers will address the BTB e-commerce market through partnerships for example Digital Island (global network and hosting provider) recently purchased Sandpiper (global content distribution) and is partnering with Inktomi (caching and content distribution software) to better enable effective content management for global organisations. Other organisations such as Adero and Akamai are network agnostic choosing instead to partner with a number of content and hosting providers and building a virtual network of servers for content distribution. Adero for example is partnering with Exodus, Global Centre and COLT giving it a global presence in 18 countries worldwide.

Companies in this sector are likely to benefit from the growth towards outsourced hosting solutions from companies of all sizes. Rising competition for basic hosting facilities though will mean that the most successful companies will be those that can move up the value chain to address companies’ and trading communities’ need for increasingly sophisticated content management services, strong service level agreements and help with back end integration and consulting.

TECHNOLOGY PLATFORM VENDORS

Major technology vendors including HP, Compaq, SUN and IBM are focusing on extending their offerings to address the e-commerce requirements of SMEs, dot.com companies and online trading communities. In order to address the SME and dot.com sectors these vendors are focused on building out application service provider (ASP) offerings. The ASP model enables technology platform vendors to package their technology and technical support as part of a hosted commerce offering in partnership with a combination of large network providers, application vendors, hosting companies and infrastructure equipment vendors. Examples include Compaq’s $500 million partnership deal with C&W aimed at providing SMEs with end-to-end e-business solutions and Sun’s partnership with Oracle, Cisco and Exodus to offer subsidised technology packages for start-ups as part of the www.business-incubator.com scheme running in the UK with plans to expand into the Netherlands and Germany in 2000.

Technology platform vendors are also looking at extending functionality to address the requirements of trading communities with IBM for example recently launching its WebShare Commerce Suite 4.1 that includes a suite of order management, auctions, personalisation and content management applications.

SECURITY PLAYERS

A comprehensive and trusted security infrastructure is critical for BTB e-commerce. A variety of companies provide the technologies, policies and infrastructure that permit business transactions between parties to occur over a global public network with confidence that the parties are who they claim to be, and that the content of the message has not been altered or intercepted. Until recently, security in the enterprise has been a matter of thoroughly executing on rather basic techniques and precautions, but BTB e-commerce means that enterprises must increasingly provide access to their systems not only to employees but increasingly to existing customers and suppliers and new trading communities.
Security comprises a number of elements, some of which we list below:

- **Authentication**: verifying the identity of parties in a transaction.
- **Encryption**: ensuring that a message is not intercepted or altered en route.
- **Non-repudiation**: creation of an audit trail which ensures that parties cannot dispute transactions.
- **Network security**: protection of systems and databases from external attack.

Within B2B commerce, authentication and encryption are areas where the immediate opportunities lie. Encryption addresses the area of secure delivery of content including credit card information, purchase orders etc. An encryption algorithm transforms plain text into a coded equivalent known as cipher text for transmission or storage. The coded text is then decoded on the receiving end. Shared key systems use the same key to encrypt and decrypt the message, requiring the sender and the receiver to have a key that is unavailable to others. Public key encryption is based on each party having two keys, a public key and a private key. When sending a message, the sender encrypts the message with the recipient’s public key and signs the message with the sender’s private key. Upon receiving the message, the recipient decrypts the message with the recipient’s private key (this ensures that only the given recipient can read the message) and interprets the signature with the sender’s public key (this ensures that the message could only have been sent by the stated sender).

Since a private key may only be accessed by the owner, various methods of identification are required to provide access to a private key. These typically involve a password / pin but may also include iris scan, finger print, physical signature capture, voice recording etc. The process of signing a document with your private key effectively creates a digital signature. Digital signatures are increasingly difficult to counterfeit and easy to verify making them superior to even handwritten signatures (under laws currently being passed by European countries in response to an EU directive, digital signatures will be considered as legally binding as a written signature). A trusted third party, or certification authority, provides access to public keys, certifying that a public key really is that of a given person or organisation. Public keys can either be accessed in a centralised database operated by the certification authority, or can be freely distributed as a digital certificate. A digital certificate is a copy of a person’s public key which has been digitally signed by the certification authority. Certificates are issues by companies such as Entrust, Baltimore (in the process of acquiring Cybertrust) and VeriSign. While some of these sell security management solutions in-house, increasingly they are offering an outsourced certificate issuance and management service. In Europe, Verisign is teaming up with local providers such as BT to do this.

The various technologies outlined above need to work with a technical and institutional framework that can guarantee a certain level of security to business buyers and sellers. PKI is an underlying technical and institutional framework that allows public keys to be managed on a secure basis for use by widely distributed users or systems. These services are provided by government agencies, technology providers such as VeriSign (a spin off of RSA Security), service providers such as GTE and Deutsche Telekom or by third party financial institutions. The key here is an established network along with a reputation for trustworthiness. Integral to a PKI are the means of authentication and encryption, secure directory services, secure interoperation of directory services and end user access to directories and the Simple Distributed Security Infrastructure SDSI (SDSI is a system that uses public key cryptography combined with mechanisms for defining groups and group membership certificates).

Some interesting security developments are coming from companies operating at the network layer. Large carriers are building out secure extranets through working with network equipment vendors including Cisco to incorporate encryption into routers and switches as well as in separate devices in the network. Carriers are looking to retail security services in the form of secure extranets to enterprises and offering these as wholesale services to smaller service providers and ASPs.
APPLICATION VENDORS

As the BTB e-commerce market increases in size, so does the market for e-commerce trading, sales and marketing software applications. Currently the European market is dominated by American companies, profiting from their head-start in the United States to expand their business in Europe, but the need for local expertise has also led to the creation of European-based e-commerce software vendors, although so far only a select few (Infobank, Intershop, Worldpay) have been able to establish a global or even regional presence. Many of these players have focused on building in the necessary features for European rollouts from launch, for example the support for 52 languages and multiple currencies in the Infobank MRO procurement package, whilst US application vendors have tended to focus on requirements for the US market. We believe that the European market will experience healthy growth over the next few years because of the demand for local language, support and knowledge, with industry analyst estimates for the European market standing at between $470 and $500 million by 2003 (IDC $479 million by 2003).

The pure-play e-commerce software vendors such as Broadvision, Intershop, Cybersource, Mediasurface, Bid.com and Open Market (who are BTC market leaders in Europe) are starting to move into the BTB market along with pure-play BTB focused application vendors Infobank, Ariba and Commerce One. A major presence in the BTB market though will increasingly come from the established enterprise application vendors including Oracle, SAP, JD Edwards and Peoplesoft, Concur, and Clarus, who along with supply chain vendors (Manugistics, Extensity, i2) and vertical players such as Systemcare (engineering MRO) are looking to extend their supply chain and customer relationship applications out onto the web through a combination of build (Oracle, SAP), partnerships (Ariba/SAP, Commerce One/PeopleSoft) and acquisition (Concur/7software). Larger established ERP application vendors along with other software powerhouses including Netscape, Microsoft and IBM are looking to increase their share of the sales and marketing applications in the emerging BTB space by leveraging their financial strength, distribution networks, and brand visibility in large accounts.

In the SME area large vendors such as Microsoft and AOL/Netscape are leveraging their BTC shopping portal businesses to make in-roads into the SME BTB e-commerce market. As an example Microsoft launched bCentral.com at the end of 1999 which offers SMEs access to hosted applications that allow them to launch, market, sell and manage their businesses online. Large application vendors and portal players that can continue to offer and extend application functionality at low upfront cost to the SME sector will dominate this sector moving forward.

CONTENT PROVIDERS

Content providers play varying roles in facilitating BTB trade and building communities that facilitate trade. Major content owners such as EMAP are looking to leverage their established publications to build online trading communities whilst companies such as Dun & Bradstreet have formed an internet based subsidiary eccelerate.com to offer database content from 58 million companies worldwide, as a service to multiple trading communities or individual buyers. In addition content providers are looking to distribute their content in various forms via multiple devices as well as categorise and streamline content for specific marketplaces, suppliers or individuals. We believe that as BTB trading communities grow in transaction volume, the aggregate data they can generate on transaction types, volumes, trading patterns and trends will become extremely valuable to industry players. To compete with these new sources of realtime, strategic data being generated by the most successful business-to-business sites and marketplaces, established content providers will need to offer a greater amount of analysis and comment. This has already started to happen among firms on sites such as the Financial Times and Hoovers.com, who offer basic content for free but increasingly charge for additional analysis.
TRADING COMMUNITIES

Trading communities are internet based hubs that focus on specific industry verticals or specific industry processes (horizontal marketplaces) and use various market making mechanisms (auctions, exchanges, aggregation) to mediate any-to-any transactions amongst businesses. Trading communities lie at the centre of convergence between content, communication and commerce, and offer the potential for companies to conduct one-to-many-to-one trade. In other words they provide a hub through which buyers and sellers can trade electronically with established partners whilst at the same time get access to a new markets and new parts of the supply chain. Marketplaces can be public, where all members participate in an open, interactive buying and selling community, or private, which are invitation-only communities whose members participate in special pricing arrangements and/or product and service offerings. The key organisations building and operating marketplaces include dominant industry players (Ford AutoXchange), industry associations or trading groups (ENX), large distributors VWR/(Chemdex), Systems integrators (EDS), software providers (Commerce One, Ariba, Systemcare), and spin-offs or start-ups built out of teams or individuals from existing industry organisations (Band-X, Altra Energy, 58K).

SYSTEM INTEGRATORS

Businesses need to restructure the way they work if they are to recognise the key cost savings and new revenues offered by BTB e-commerce. This in turn requires not only integration of I.T. systems between businesses and their new trading partners, but also business re-engineering. The high end of this market is being addressed by established system integration houses (KPMG, Andersen Consulting, Deloitte & Touche, Ernst & Young, PwC) who are putting significant resources around the development of their e-business practices. As an example in December 1999 PwC announced that they were planning to increase revenues related to e-business by 20% a year for the next 5 years. Established facility management companies including EDS, ICL and second tier international players including Cap Gemini, Cambridge Technology Partners, Logica, Sema, Perot and Origon are also entering the BTB e-commerce market. These large organisations have started to streamline their offerings by industry and are working in partnership with professional services groups within each sector of the value chain (infrastructure equipment vendors to application vendors) to offer end-to-end vertical solutions. A key example of this closer integration with equipment vendors is Cisco’s $1 billion investment into KPMG’s consulting arm to build 6 centres that will allow the two companies to provide additional support to Cisco customers.

The middle to high-end of the market is being addressed by providers who have focused on offering integrated web design, back end systems integration and business services. These ‘one-stop-shop’ vendors are emerging from a number of sectors including the traditional web design houses (Razorfish, Organic, iXL), large niche system integration houses including USWeb/CKS and Viant in the US and smaller niche SIs in the UK including Nvision, CommerceNTI, Jacobs Rynall and CSF. As an example, the established US web design company Razorfish acquired a back-end system integration house iCube for $68 million (who bought a similar outfit, Conduit, in the UK). Together with webhosting partners Digital Island and Exodus, Razorfish is increasingly able to offer an international one-stop solution to medium and large enterprises. These vendors offer a combination of SI, bespoke code, advice on ISPs, business services and web design at a price point of $50,000 to $100,000 for scoping and $0.5 to $1 million for build.

The lower end of the market is being addressed by ISPs (Freeserve and Planet), brand names (Virgin) and start-ups (Freecom.net, App-Tap) working together with hardware manufacturers (IBM, Compaq), software vendors (Microsoft, Intershop) and resellers to offer SMEs an out of the box e-commerce solution. The system integration component of this offering will need to be addressed through a network of organisations who have an understanding of the needs and an established relationship with small organisations. These integrators will play an increasingly important role in the BTB e-commerce space as larger organisations force smaller suppliers into trading communities. Local value added resellers and web hosting companies are in a strong position to address this demand but to date have been slow to enter the market.
BTB E-COMMERCE APPLICATIONS

THE GROWTH OF ASP SOLUTIONS

“An ASP is an agent or broker who assembles functionality needed by enterprises or SMEs, and packages it with outsourced maintenance and other services. The essential difference between an ASP and an outsourcer is that an ASP will manage application servers in a centrally controlled location, applications will be accessed via a browser over a wide area network and the application will be offered as a service which would include the application hardware, service, support upgrades and maintenance”

Source: Durlacher Application Service Provider Report: 1999

E-commerce applications are increasingly being included as part of a hosted application suite from ASPs including Interliant, USInternetworking, Corio, HP, Futurelink, Aspective as well as telco’s (BT, Swisscom, Deutsche Telekom) and traditional ISPs turned Commerce Service Providers (PSInet, Planet, WorldOnline, etc). The growth of the ASP market will have a strong positive effect on penetration of e-commerce applications into the SME sector. The first element of this is driven by cost. ASP pricing models are driven by advertising, subscriptions and transactions rather than large up-front perpetual license fees that can currently run from $100,000 upwards. A second element comes from ASPs ability to take responsibility for system development and maintenance easing the burden on smaller organisations to find and keep expensive IT staff.

In turn the ASP model is putting expensive e-commerce functionality into the ‘network’ and making this available to a much larger number of businesses. Examples of this include Commerce One’s CSF hosted buy-side solution which gives browser based access to sophisticated workflow functionality once only available to larger organisations. Another example is Broadvision’s hosted solution which gives SME’s browser based access into sophisticated content management, profiling and transaction management functionality. A final example is Clarus who have teamed up with a number of ASPs including USInternetworking (USI) and Interliant to offer electronic procurement applications as services to both the enterprise and SME markets. ASPs are increasingly bundling these different applications together to offer a more complete e-commerce offering.

The growth of the online intermediary (OI) could be viewed as taking the ASP model one stage further. OIs – discussed in detail in the next section- are increasingly offering hosted e-commerce applications (exchange, auctions, payment, supply chain, decision support etc) along with content and offline services to extend the functionality and value of their trading communities. The key here is that the trading community extends the one-to-many reach of the initial ASP offerings to a one-to-many-to-one environment in which companies of all sizes have the potential not only to get access to expensive application functionality but also in the case of hosted supply chain management software, the ability to use the trading community to share this functionality directly, with more of its supply chain.
We believe that e-commerce applications will continue to be sold directly into large organisations, as well as being offered as a part or fully managed ASP solution to small and medium organisations, either through established ASPs or as part of a commerce solution offered by a growing number of trading communities.

<table>
<thead>
<tr>
<th>Buy-side</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ariba ORMX</td>
<td>MRO E-procurement</td>
</tr>
<tr>
<td>Clarus</td>
<td>MRO E-procurement/Expense management</td>
</tr>
<tr>
<td>Commerce One</td>
<td>MRO E-procurement/Supply chain management</td>
</tr>
<tr>
<td>Concur</td>
<td>MRO E-procurement/Expense management</td>
</tr>
<tr>
<td>Datastream</td>
<td>Enterprise asset management</td>
</tr>
<tr>
<td>Elcom</td>
<td>MRO E-procurement</td>
</tr>
<tr>
<td>Infobank</td>
<td>MRO E-procurement</td>
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<td>MRO E-procurement</td>
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<td>Right Works</td>
<td>MRO E-procurement</td>
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<tr>
<td>PurchasePro</td>
<td>MRO E-procurement</td>
</tr>
<tr>
<td>Extensity</td>
<td>Expense management</td>
</tr>
<tr>
<td>Oracle</td>
<td>ERP</td>
</tr>
<tr>
<td>SAP</td>
<td>ERP</td>
</tr>
<tr>
<td>Systemcare</td>
<td>Supply chain</td>
</tr>
<tr>
<td>Aspect Development</td>
<td>Decision support</td>
</tr>
<tr>
<td>Broadvision</td>
<td>Content management/Personalisation</td>
</tr>
<tr>
<td>INTERSHOP</td>
<td>Packaged sell-side application</td>
</tr>
<tr>
<td>INEX (bought Infospace)</td>
<td>Packaged sell-side application</td>
</tr>
<tr>
<td>Interworld</td>
<td>Packaged sell-side application</td>
</tr>
<tr>
<td>Mediasurface</td>
<td>Content management/Personalisation</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Packaged sell-side application</td>
</tr>
<tr>
<td>Netscape</td>
<td>Packaged sell-side application</td>
</tr>
<tr>
<td>Openmarket/ Future Tense</td>
<td>Packaged sell-side application</td>
</tr>
<tr>
<td>Portal Software</td>
<td>CRM</td>
</tr>
</tbody>
</table>

Table 2: Subset of e-commerce ASP offerings

Source: Durlacher

Figure 10.
Source: Durlacher and Infobank
There are basically five key application types that enable businesses to either trade directly or via a centralised trading community, these include:

- Sell-side applications that enable companies or trading communities to build storefronts to sell products
- Buy-side applications targeted initially at the largest buyers (but increasingly hosted by ASPs to address the SME market), that allow companies to buy across existing or new suppliers.
- Market making applications that allow multiple buyers and sellers to come together to trade.
- Supply chain applications that enable the integration of supply chains and help buyers and sellers to collaboratively plan, forecast and replenish inventory.
- EAI (enterprise application integration) and middleware applications that enable a company’s back-end system to be more tightly integrated into online trading communities or with customers and suppliers
Sell-side applications

Sell-side application vendors are looking to provide solutions to help enterprises sell their goods and services to other businesses over the web. This category consists of applications that address the areas of content management (electronic cataloguing, profiling and personalisation, searching and product configuration) and transaction processing (credit checking, payment processing). Within this group are several subcategories of software including catalogues, configurators, personalisation engines and payment technologies.

This area of the market is highly fragmented. Vendors who have entered this market include dominant software houses (IBM, Microsoft, Netscape/AOL), ERP vendors (Oracle, SAP), traditional EDI vendors (Sterling Commerce, Harbinger), BTC e-commerce application vendors (Interworld, Broadvision, Openmarket) and Customer Relationship Management vendors (Siebel). At the enterprise level these players are looking to remedy the shortcomings of enterprise resource planning systems in offering an internet front-end into existing systems thereby giving customers a link to real-time inventory systems that allow a more transparent view of what items are in stock, what is on order and how quickly items will arrive. In addition many of these organisations are also providing solutions to smaller organisations with no ERP system, by offering them tools and services to catalogue goods, sell online and track customer buying habits.

Large established software vendors including IBM, Microsoft and Oracle have developed what are commonly referred to as commerce platforms which provide software, a framework and tools for the development of BTC and increasingly BTB e-commerce offerings. These applications were traditionally sold to the largest organisations as they required a fair amount of customisation. As the number of organisations using the web to sell their products has grown, it has created the opportunity for software vendors to sell packaged applications. These packages typically offer anything from 20% to 80% of out of the box functionality. We believe that companies doing BTB e-commerce will increasingly buy rather than build their sell side applications, except in the situation where applications bring a significant source of competitive advantage. In the case of the latter companies may increasingly buy in and customise existing industry specific modules. This trend towards packaged, off the shelf software will rapidly increase the market potential for vendors operating in this sector.

Vendors have varied on their approach to extending functionality, with Broadvision, for example, building a wide range of tools (transactions, workflow, site management, personalisation, content management etc) into its own platform through acquisitions and internal development. Vignette, on the other hand, is focusing on personalisation and content management, and offers other services through a range of partners. Both approaches typically still require a fair amount of customisation and system integration. Newer vendors including Mediasurface, are looking to address this through building out an open content management platform with plug and play interfaces to best of breed product, whilst at the same time developing and partnering with independent software vendors to build out new functionality.

We believe that it is possible that the focus of BTB e-commerce application software will shift away from narrowly defined commerce platforms to a broader vision of managing customer relationships. This will involve convergence in the sell side space. As an example Manugistics has already partnered with Siebel to offer customers an internet based platform for demand planning, supply chain collaboration, inventory and shipment status. In addition we are seeing partnerships between buy-side and sell-side vendors for example Interworld’s global marketing and technology relationship with Ariba, and Commerce One’s partnership with Intershop.
Cataloguing vendors are looking to address the business demand for a searchable online database of suppliers goods and services that allow businesses to offer real time inventory status, more sophisticated up-sell and cross-sell relationships and the ability to offer more accurate pricing and product descriptions. Catalogue companies are also looking to customise interfaces to reflect existing offline relationships in terms of volume discounts, buyer status and bundled offers. Whilst at the same time giving buyers access to new products or, in the case of aggregated catalogues, more suppliers.

The database is the foundation of most electronic catalogues and today is hosted by a combination of the buying organisation, the supplier or a third party (virtual distributor, third party marketplace). Durlacher believes that it is possible that over the next 3 years 80% of all suppliers in Europe will have their stock online in a database hosted by one of these parties.

Catalogue management is complex and time consuming. This has enabled cataloguing vendors including Aspect Development, Harbinger and Requisite the opportunity to offer their software as a hosted service. Aspect Development launched a subscription based service- Preferred Catalog – in August 1998 which currently manages over 3600 supplier catalogues; and 18 million line items. Harbinger offers a service for migrating proprietary, legacy cataloguing data into standard formats through Harbinger.net and Requisite offers cataloguing services to SAP and Oracle.

Facilities management organisations including ICL and IBM are a second set of player entering the cataloguing area. ICL has 3 UK data centres with further facilities planned for the Nordics, Netherlands and Finland in 2000, hosting 300 catalogues, 30,000 products and employing 15 people to work with suppliers to make system updates. IBM, is offering cataloguing hosting facilities for industry specific catalogues in Europe.

The medium term success of companies operating in this space will lie with their ability to upload a suppliers catalogue once and make it available anywhere. This in turn will support companies offering managed distributed, open platforms, in addition to players who are aligning themselves with the cataloguing standards being developed through a world standard currently referred to as the United National Standard Product and Services (UNSPSC). This code allows procurement staff in large organisations to correlate internal coding systems with the industry standard. A lot of work still needs to be done to standardise more sophisticated features. In the longer term we believe that XML will have

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Background</th>
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<tr>
<td>Art Technology Group (ATG)</td>
<td>Pure-play</td>
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<td>Aspect Development</td>
<td>Established software vendor</td>
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<td>Broadvision</td>
<td>Pure-play</td>
<td><a href="http://www.broadvision.com">www.broadvision.com</a></td>
</tr>
<tr>
<td>Elcom International</td>
<td>Pure-play</td>
<td><a href="http://www.elcom.com">www.elcom.com</a></td>
</tr>
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<td>Harbinger</td>
<td>EDI</td>
<td><a href="http://www.harbinger.com">www.harbinger.com</a></td>
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<td>Pure-play</td>
<td><a href="http://www.intershop.com">www.intershop.com</a></td>
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<td>IBM</td>
<td>Established software house</td>
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<td>ERP</td>
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<td>Pure-play</td>
<td><a href="http://www.mediasurface.com">www.mediasurface.com</a></td>
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<tr>
<td>Mergent Systems (bought by Commerce One)</td>
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<td>Microsoft</td>
<td>Established software house</td>
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<td>Netscape</td>
<td>Established software house</td>
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<td>Trilogy</td>
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<td>Vignette</td>
<td>Pure-play</td>
<td><a href="http://www.vignette.com">www.vignette.com</a></td>
</tr>
</tbody>
</table>

Source: Durlacher
a big impact on catalog vendors and proprietary catalog systems will be dropped as companies move towards open standards. In addition we believe that successful players will be those who align themselves with major ERP and emerging buy-side and sell-side software vendors and offer their service as part of a larger tool set or service.

Table 4: Competition in the cataloguing space

<table>
<thead>
<tr>
<th>Vendor</th>
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<tbody>
<tr>
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<tr>
<td>Aspect Development</td>
<td>CSM Catalog Management</td>
<td><a href="http://www.aspectdv.com">www.aspectdv.com</a></td>
</tr>
<tr>
<td>Harbinger</td>
<td>Harbinger Knowbility Catalog+ Harbinger Knowbility Supplier+,</td>
<td><a href="http://www.harbinger.com">www.harbinger.com</a></td>
</tr>
<tr>
<td>Mercado</td>
<td>IntuiFind Merchant Catalog</td>
<td><a href="http://www.mercadosoftware.com">www.mercadosoftware.com</a></td>
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<td></td>
<td>IntuiFind Procurement Catalog</td>
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<tr>
<td>Requisite</td>
<td>Unified Catalog</td>
<td><a href="http://www.requisite.com">www.requisite.com</a></td>
</tr>
<tr>
<td>Connect Inc</td>
<td>Marketstream 2.0</td>
<td><a href="http://www.connectinc.com">www.connectinc.com</a></td>
</tr>
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<td>iCat (Intell)</td>
<td>iCat Electronic Commerce Suit</td>
<td><a href="http://www.icat.com">www.icat.com</a></td>
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<tr>
<td>QRS corporation</td>
<td>QRS Keystone</td>
<td><a href="http://www.qrs.com">www.qrs.com</a></td>
</tr>
</tbody>
</table>

Profiling/personalisation

Personalisation involves tailoring a site to individuals or classes of individuals. In the BTC world the merchant often has limited prior knowledge of the customer and the website is used to gather this through customer supplied info, IP address demographics, click stream data (current surfing habits) and past transactions. This information is then used to provide more targeted selling. In the BTB world the seller often already has a relationship with the buying organisation and knows some of their buying requirements. This means that online personalisation must extend into offering a customised interface that mirrors existing offline relationships (volume discounts, product requirements, past purchases) whilst at the same time opening up opportunities to offer targeted promotions and information.

The internet is seen as an increasingly important medium to build up more sophisticated user profiles of existing business customers, or in the case of BTB marketplaces make educated guesses about smaller customers who may be unknown. Many of the techniques used in BTC sites work to track online surfing habits after a customer has logged in.

- Collaborative filtering takes advantage of previous decisions made by other people/organisations with similar user profiles to select information (e.g. adverts, product suggestions, news etc) that are likely to be relevant to that person.
- Rules based personalisation uses a content matching engine and a set of rules to identify content that is relevant to a user/organisations profile.
- Case based personalisation matches user supplied free form information ie question and answer sessions to match a user to a short list of services. This is useful in the BTB environment when a buyer is unsure of the exact item that they are looking for.

Sell-side packaged application vendors including ATG, Broadvision and Interworld have strong personalisation offerings, as do a number of niched vendors who are focused on this area including Engage Technologies, Firefly Network, Multilogic, Net Perceptions, Vignette, Haht and Media Surface.

We believe that vendors in this space will continue to forge new relationships with internet technology companies, systems integrators, and web developers to complement existing alliances with hardware and content distribution companies (which often make up for up to a third of sales). An example of the latter is Broadvision’s relationship with Macromedia and Hewlett Packard. In addition we believe that companies in this sector may also acquire businesses that offer call centre and telemarketing technologies and services in order to integrate internet information with all other parts of the business.
Configurators

Another offshoot of personalisation is configuration. Configurators are software tools that allow a user to define a product that meets certain given criteria by combining a number of parts, features or functions. Initially configurators were add-on modules for back-office ERP systems used by trained sales specialists, but increasingly these tools are being deployed with web interfaces. Cisco and Dell have been very successful users of this technology for the online configuration of routers and PCs respectively. Some of the key vendors operating in this market include Selectica, Trilogy software, PersonaLogic and Calico Technology.

We believe that configuration software will be incorporated into existing ERP systems or within larger packaged application suites.

Payment applications

Payment applications for electronic business mirror the conventional payment methods cash, cheque, credit transfer, debit transfer and payment cards. Online payment applications work to replicate many parts of the offline process, for example they enable cheques and giros to be issued electronically, allow bill presentation and payment online as well as facilitate the use of payment and credit cards over the internet.

For BTB e-commerce to succeed, purchasing of goods online needs to be easier and faster than traditional offline transactions. In addition, online payments must address the problem of lack of face-to-face contact and therefore the need for authentication, as well as network security.

Some of the key areas that software vendors are currently addressing include:

- Support for multiple payment options (purchasing cards, credit cards, automated handling charges (e.g. direct debits), digital checks)
- Support for multiple currencies
- Tax and shipping cost calculations
- Credit checks
- Electronic bill presentation and payment

In the newer internet based models of auctions and exchanges, buyers and sellers may be more anonymous and authentication will play a greater role. To meet this need, suppliers may offer wallets of different kinds, a wallet being an electronic file containing the purchaser’s financial information for multiple payment alternatives along with encryption and certification information for each. Electronic payment is relatively advanced in Europe with 94% of all banks offering online banking in 1999. In addition Europe is ahead of America in that many corporations already use direct credits and many smaller organisations already pay some of their regular bills via direct electronic payments.

The market for online payment system providers is at an early stage and is made up of a combination of payment systems and products and services companies. These companies are driven principally out of venture backed start-up organisations, existing BTC offerings or from parts of the established offline BTB transaction supply chain. Internet start-ups in the US have been ahead of established offline companies including First Data Corp (transaction processing), Fair Isaacs and Co (risk scoring) in launching internet based services. These start-ups have focused on building a number of internet based processes including tax calculation (Taxware), credit card processing in multiple currencies (Worldpay, Cybercash, Cybersource) and online fraud screening (Cybersource).
Applications are increasingly offered as services with revenues often generated through a setup fee along with a fee per transaction.

<table>
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</table>

Source: Durlacher

Buy-side Applications

As mentioned earlier the current focus of organisations is increasingly on integrating ERP and other internal systems with those of an organisation’s suppliers and customers. Buy-side e-commerce solutions are looking to help companies streamline business processes by providing greater visibility of the supply chain. In addition these solutions reduce the sales cycle time by helping to improve the product development process and finally these solutions usually aggregate historical transaction data and provide real-time reporting to help organisations organise and use customer data. Existing ERP systems lack integration to the systems of other organisations within the value chain and because they are costly and difficult to implement have tended to be relatively inflexible. This has provided the window of opportunity for new application developers to get in ahead of the curve.

The buy-side application space was initially driven by pure-play buy-side vendors including Ariba and Commerce One who built out solutions to address the inefficiencies in purchasing of in-direct goods and services across large organisations. The purchase of these types of goods tends to be highly fragmented with a fair amount of maverick buying and an inability among companies to co-ordinate volume discounts across departments, or to track company spend. The huge potential of this market opened up by pure-play e-commerce vendors has been recognised by established software vendors including ERP vendors (Oracle, SAP, Peoplesoft), internet expense management software companies including (Concur, Captura) and Asset Management organisations (DataStream). These companies are looking to leverage their existing customer base and knowledge of vertical sectors to drive adoption of their new buy-side offerings.

In order to remain competitive pure-play internet companies are rapidly buying and building up functionality for example Ariba has recently purchased TradingDynamics (auctions) and Tradex (exchanges) and Commerce One purchased Commercebid (auctions) and Mergent Systems (cross catalogue searching). In addition, buy-side application vendors are hosting third-party applications, for example Commerce One is hosting a range of transaction and payment services, tax by Taxware, logistics by UPS and Tandata, and business intelligence through Cognos and Sagent.
Table 6: Subset of key buy-side application vendors

<table>
<thead>
<tr>
<th>Company</th>
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<td>Pure-play</td>
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<td>Datastream Systems</td>
<td>Enterprise asset management</td>
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<td>Pure-play</td>
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<td>Established software vendor</td>
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<td>ERP</td>
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<td>RightWorks</td>
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<td>ERP</td>
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</tbody>
</table>

Many of the buy-side vendors including Oracle (iPayment, Istore, lmarketing, lsupport), Netscape (BuyerXpert) Infobank (InTrade Purchaser) have developed packaged buy-side application suites that are typically sold into the largest buyers and have a number of functional components including a multi-supplier catalogue; rules based workflow system for routing purchase requisitions through an organisation’s approval process; a mechanism for transmitting approved purchase orders to vendors; a method of checking product availability and order status and a set of management and reporting tools.

- Multi-supplier catalog: Applications from vendors including Netscape, Infobank, Commerce One, SAP, Oracle and Ariba allow employees in large buying organisations to aggregate and compare products across an organisation’s approved suppliers. The catalog may reside on a server at the buying organisation, or buyers may connect directly to suppliers catalogues over the internet and see a personalised view of products and pricing. Alternatively cataloguing software is hosted by a third party such as the Commerce One Marketsite hosted by BT in the UK. Cataloguing tools built into these software applications include mechanisms to allow multiple supplier updates and buyer approval of suppliers.

- Workflow: Workflow systems built into buy-side applications allow individual employees to create purchase requisitions, and have these automatically routed through the necessary parts of the organisation for approval. The specific routing taken by any transaction will depend on the content of the transaction and will be mapped into the software as a set of rules that will be different for each company or each department.

- Supplier interfaces: Buy-side applications also allow for the automatic transmission of approved orders to a supplier via EDI links, network links via leased line, email or fax. In turn many applications also now provide a receiving interface that tells suppliers that the goods have been received by the buyer. The growth in the number of always on connections in Europe will help more of these requests to be processed in real-time.

- Management and reporting tools: Management and reporting tools are key to the success of a buy-side application suite especially in large organisations. These tools allow an administrator to grant various levels of access to the system, control updates to catalogues and monitor the status of transactions. In addition reporting tools allow for an audit trail of what has been purchased by whom as well as the ability to report on performance of suppliers and track where money has been spent. These applications are increasingly tightly integrated into existing ERP systems in large organisations through partnerships, for example the Commerce One partnership with PeopleSoft, and Ariba’s partnership with SAP.
We believe that current buy-side application vendors will move into supply chain management solutions. At the same time we believe that existing ERP vendors and supply chain vendors (e.g. Manuguistics, i2) will extend their offerings to focus on e-procurement. Many of these established players have large installed customer bases and will benefit from existing workflow tools that pure-play procurement vendors are currently having to develop.

Most of the pure-play e-procurement application vendors have focused on indirect procurement that reduces transaction costs across multiple industries. Increasingly, though, these companies are looking to move into the direct procurement space. This requires a greater degree of understanding of industry specific business processes. We believe therefore that existing players will work to increase functionality whilst at the same time partner with industry leaders, and emerging vertical portals to provide the necessary understanding. In addition this will provide a new window of opportunity for existing supply chain and ERP vendors who have focused on understanding and acquiring customers in specific verticals.

e-procurement providers will be lured by the possibility of transaction based revenue and will offer their solutions as enablers to other vertical trading portals (Infobank) and/or build their own trading hubs (Ariba, Commerce One, Concur).

Market Making Applications

The simplest of market making applications on the internet today are ‘Bid and Ask’ systems which allow businesses to place open orders to purchase particular items. Sellers on the system are notified of the buyers interest and have the opportunity to bid. This functionality has been included in more sophisticated auction (set interval) and exchange systems. Application vendors have tended to focus on one type of market making application but increasingly the market is moving towards integrated multi-mechanism platforms [as exemplified by Ariba’s purchase of both Trading Dynamics (auctions) and Trade’x (Exchanges)]. In addition application vendors, including Trade’x and Bid.com (in Europe) are focusing on building functionality that can be modified to suit vertical markets.

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<td>Connect Inc</td>
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<td>Trading Dynamics (bought by Ariba)</td>
<td><a href="http://www.tradingdynamics.com">www.tradingdynamics.com</a></td>
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</table>

Source: Durlacher
Auctions

There are around 15 different types of offline auctions including reverse auctions, Yankee, Dutch and English, that auction software aims to mirror online. Some of the current functionality in auction software includes registration of buyers and sellers, management of user accounts, automation of the bidding process and email notification of the status of the bidding process. Auction software today largely relies on buyers’ and sellers’ existing order management systems to handle the remainder of the processing (tax, payment, logistics) but are likely to build up some of this functionality over the next 12 months. Over the past year there have been a host of new start-ups developing auction technology. Auction technology is increasingly being incorporated into existing applications through:

- **Acquisition:** Ariba’s purchase of Trading Dynamics
- **Build:** Microsoft released a free auction toolkit for its Site Server Commerce Edition.
- **Partnership:** Persistence Software linked up with Cysive to develop web based auction technology.

Full auction frameworks are being provided through a host of partnerships with application, webserver, caching, database and message broker partners. In addition established bricks and mortar auction facilities such as AbleAuctions in the US (computers, electronics, office equipment, furniture) are looking to bring their offline experience to the Internet through live broadcasts. The website provides the ability for buyers to log in, register and bid in real-time for any article being sold in a number of key auction locations (launch planned for Europe in 2000/2001).

Exchanges

A second market making mechanism is the exchange or two-way auction platform which enables temporal matching of supply and demand. Internet based exchange platforms today contain a high speed bid-ask matching process, marketplace management tools for user hierarchies and permissions and supplier and pricing management. More sophisticated application providers are looking to develop settlement and clearing functionality. Technology vendors operating in this space include Trade’ex, Bid.com and Tradient along with platforms developed within vertical markets including eSteel (steel) and ComDAQ (commodities exchange sites for coffee and sugar).

Supply chain Applications

Supply chain applications play an important role in providing sellers with access to supply chain capacity enabling them to determine whether an online customer order can be fulfilled. Applications that address this space are essentially decision support software packages that use mathematical principles to balance multiple levels of demand and supply in the supply chain taking into account availability of transportation, manufacturing capacity, finished goods and alternative inventory supplies. The end-game for these applications is to provide customers with the ability to make real-time, interactive decisions.

Key vendors in this market include pure-play vendors, such as i2, and niche ERP vendors including Manugistics, and more recently the large ERP vendors SAP, Oracle and JD Edwards. i2 has a head start on the slower moving large ERP vendors as does Manugistics who, unlike ERP packages such as SAP (whose founders were experts in financial software), was started by people with significant experience in manufacturing. Their approach does not force a company to change its operations to suit the software.

We believe that larger ERP vendors will move aggressively into this market and that niche players will continue to acquire best of breed application vendors to keep ahead of the game as i2 and Manugistics have done.
Table 8: Subset of key supply chain application vendors

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Middleware for Back-end Integration

If e-commerce is to embrace the full cycle of buying and selling activities (managing customers and supplier contacts, gathering pricing info, entering and tracking orders, managing transactions and analysing customer and supplier data) then it needs to offer integration between e-commerce packages, custom applications, legacy systems and ERP applications. This opens up the demand for a ‘backbone’ system that can mediate between all these resources. The companies in the strongest position to address this market are the web based ERP vendors and the enterprise application integration (EAI) vendors. It is estimated that back-end integration into e-commerce systems can account for up to 75% of total costs of going online. We believe that as online sales grow into an increasingly significant proportion of all BTB trade so companies will have little choice but to build out real-time integration capabilities.

From a business-to-business perspective these vendors fit into two camps including technologies offering data interchange tools (XML, EDI) and BTB integration architectures (Extricity, webMethods, OnDisplay). These vendors address a number of different system integration requirements across different BTB environments including direct sales from merchant sites, many-to-many transactions off trading communities and buyer-to-supplier transactions through third party hosted procurement sites. Trading communities are likely to entail the greatest complexity because of the many-to-many nature of their offerings and the variety of disparate systems that this may involve. This will be particularly the case in closed networks such as the ENX automotive network in Germany where buyers and suppliers already have complex back end systems and established relationships. We believe, though, that complexity may increase in public networks such as Metalsite, eSteel etc. as the demand for simpler forms of integration for basic trading evolve into more complete trading solutions.

BTB integration architectures

All the major ERP vendors (SAP, Baan, Oracle, JD Edwards, Peoplesoft) have launched e-commerce strategies that extend the functionality of their packages to allow access through a standard web browser rather than an application specific client. This integration goes beyond read only access, to include the provision of a web server that implements an electronic storefront providing tight linkages from a website’s catalogue, order entry system and customer database to the back-end ERP system. This connectivity is established using connectors that are written by the application server vendor that call on application interface protocols (APIs) supplied by the ERP vendor. Some of the key vendors offering ERP application servers are Bluestone, Haht software, IBM, NetDynamics, Persistence software, Weblogic and Netscape.
Many of the traditional EAI vendors including Active software, IBM/NEON, CrossWorlds Software, Oberon, Vitria and others originally focused on intra company and industry specific integration. E-commerce is driving up the focus on corporate portals and inter company internet infrastructures. Although we believe that there is still considerable opportunity behind the firewall, the incremental opportunity lies in inter business domain integration. Some of the current EAI vendors will make this transition whilst others will remain in the internal market. The key vendors focusing exclusively around cross industry integration include Viewlocity, Extricity, OnDisplay and WebMethods. As the EAI marketplace matures we believe that current proprietary interface standards will be replaced by more open standards such as XML.

We also expect the market potential for vendors in this space to grow substantially as the need to provide real-time data from back-end systems over the internet becomes more critical.

**Data Interchange Tools**

Early adopters of inter-company integration have taken a more straight forward, data centric approach to integration. In essence they have focused on some of the application-to-application data transfer requirements that were initially addressed through EDI, involving website-to-website, application-to-website and application-to-application integration. We believe that XML will eventually play a central role in this area.

**XML**

The eXtensible Markup Language (XML) has the potential to be the standard language of e-commerce. XML is very like HTML in application and origin. They are lightweight meta-languages i.e. languages used to describe the content and the structure of the data contained within. In fact, XML allows for the creation of subset families of languages each servicing different application specific purposes. In this, HTML (which is used to visually depict content on the web) may be considered a subset of XML. XML is designed to communicate the meaning of the data through a self-describing mechanism. If companies’ information systems are XML-compliant, data (e.g. a purchase order) can be exchanged directly (computer-to-computer) even between organisations with different operating systems and data models. The drawback to XML is that it is not a data description language, rather it is a specification for creating data description languages. Trading partners or industry groups still need to get together to define what are termed document type definitions (DTD) which define how XML data is to be implemented in a particular setting.

**Repositories & Extensions**

One way that businesses are looking to standardise XML data descriptions is to establish repositories where XML specifications can be stored and publicly retrieved. Some of the major repositories are Microsoft’s Biztalk, CommerceNet, XML.org, and OASIS. These and other repositories will increasingly contain XML DTD’s developed by and to cater for, specific industry sectors. Examples of these include Ad Markup (classified advertising), RELML (real estate listings). There are also XML specifications for cross-industry documents such as purchase orders, invoices, product descriptions, and shipping schedules, developed through initiatives such as the Common Business Library CBL (driven by Commerce One), or Open Buying on the Internet (OBI). These are designed to standardise business-to-business purchasing over the internet, for high-volume, low value transactions such as those involved in maintenance, repair and operations (MRO).
IBM is also seeking to advance the features of XML through its development of the Business-to-Business Protocol Framework (BPF) to help developers create applications using tpaML (Trading Partner Agreement Markup Language) extensions to XML. These extensions take XML one step forward by including capabilities that enable companies to integrate business processes, workflow, and security into a business-to-business transaction. IBM is adding tpaML support to its software by mid 2000.

The key hurdle that XML will increasingly face will be similar to that faced over the past ten years by EDI - achieving industry wide consensus on data definitions. We believe therefore that many organisations in Europe may wait 12 to 18 months before making infrastructure changes to accommodate XML related e-commerce.

Web based EDI

EDI refers to the exchange of electronic business documents, such as invoices or requests for proposal (RFPs), between applications. The exchange involves no human interaction and no paper. These exchanges are expensive to set up and require a proprietary client as well as a network connection between the two organisations. This has traditionally been provided by a value added network (VAN) provider, who will guarantee a secure connection, bridge incompatible networks and keep track of transactions. Major developments are currently underway to migrate EDI message traffic off the VANs onto the internet as well as migrate the existing EDI messaging standards into XML. To achieve the former the IETF has proposed the Internet EDI (EDI-INT) standard, that defines the standards for using encryption and digital certificates to secure EDI transactions over the internet. Many industries are also drafting their own industry specific protocols for using EDI over the internet. Audit trails and acknowledgments are still lacking over the internet today and therefore many of the value added services are still being provided by VANs using the internet as a transmission medium.

XML is a more flexible way of defining transaction sets based on open standards of the World Wide Web Consortium (W3C). More flexible formats such as XML offer a transition from EDI fixed formats to self identifying data. We expect EDI functionality to be migrated into XML over the next two years. With emerging technologies and standards mapping desirable EDI functionality into the web environment which will in turn reduce the cost and open up EDI functionality to a greater number of smaller businesses.

We believe that during 2000/2001 European organisations will start to migrate their EDI supply chains off value added networks and onto managed extranets running over the IP backbones of the largest service providers. The key driver for this will be cost savings and the key enabler will be developments in IP technology and management that will allow for audit trails and security (development of PKI infrastructures etc) once only available over VANs.
B2B transactions have traditionally been undertaken in one of three ways.

1. Initiated by sellers – for example through advertising and a direct sales force who contacts potential buyers.

2. Initiated by buyers – for example by undertaking product searches using trade associations and company catalogues.

3. Mediated by intermediaries – for example using brokers.

The new emerging organisational relationships will continue to see transactions initiated by buyers and sellers. However, these transactions will increasingly be supplemented by intermediaries because:

• The rapid growth of websites and content means potential buyers and sellers will have difficulty locating suitable partners. This problem will increase as the number of commercial organisations with websites increases to saturation level.

• The cost of searching for potential partners on the internet can exceed any likely benefit in terms of lower prices. For example, it would not be financially sensible for a buyer to spend significant time searching for low priced stationary products.

• There are significant familiarisation and other due diligence costs for a buyer considering a transaction with an unknown seller. Although the internet can reduce these to some extent, there are still high costs associated with ensuring a product offered by a seller matches the buyer’s expectations in terms of quality, performance and ongoing support. This is particularly the case for small business selling products because buyers need to ensure the former will continue in existence.

<table>
<thead>
<tr>
<th>Table 9: Advantages of dynamic trade</th>
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<td><strong>Market liquidity</strong></td>
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<tr>
<td><strong>Product liquidity</strong></td>
</tr>
</tbody>
</table>

Intermediaries theoretically resolve the uncertainties that e-commerce poses for buyers and sellers coming together with no previous transaction history. The role of the intermediary centres around the areas of communication, commerce and content and includes:

• Bringing together buyers and sellers within an electronic network

• Providing a method for transactions to take place, for example through an auction and standard contracts in order for them to be cleared. This means that a new contract does not need to be prepared for each transaction.

• Qualifying buyers and sellers. For the former they will provide assurance that sellers have suitable goods, a ‘track record’ and minimum levels of quality. For sellers they will provide assurance that the buyers are capable of making payments

• Aggregate third party content

• Create original content through aggregating trading data and user data
Value added services such as insurance, logistics and financing through partnerships with third parties

Targeted communication through offering email, alarms and alerts and personalisation of advertising and content. Advanced messaging and filtering is necessary to preserve existing business relationships

DEFINITION OF AN OI

An online intermediary (OI) is a third party that combines enabling BTB technology along with market-specific or process specific expertise to facilitate trade. The exchange of information underlying this exchange can be extended to include a physical flow of goods or services but today these are largely the responsibility of the buyers and sellers.

OIs have the potential to create near perfect, efficient markets. Intermediary offerings are being built and operated by a number of different parties including:

- Dominant industry players building closed trading communities, for example Ford, GM and DaimlerChrysler in the automotive sector and Sears/Carrefour in the retail sector.
- Industry associations or trading groups for example ENX (automobile network exchange operating between car dealers in Germany, France, UK, Spain) which is owned and operated by 16 European automobile manufacturers and suppliers, as well as four national automotive associations, and AUTIF (Association of Unit Trusts in the UK).
- Large distributors e.g. Chemdex in partnership with AVM
- Teams spun out of industry service companies e.g. insurance, financing
- Systems integrators e.g. EDS
- Software providers e.g. Commerce One, Ariba, Systemcare
- Spinoffs or start-ups build out of teams or individuals from existing industry players e.g. Band-X, AltraEnergy
- Spinoffs from neutral industry service providers (Insurance, finance etc)

MARKET APPROACHES

Horizontal and Vertical Markets

Online intermediaries have adopted a horizontal or vertical strategy depending on the key inefficiencies they are seeking to address. Vertical intermediaries have focused on inefficiencies that exist across a supply chain within a specific industry sector e.g. chemical, automotive or steel, and generally involve streamlining the trade of direct goods (goods involved in the finished product or service).

Examples include:

- Telecoms (Band-X)
- Automotive (Worldparts)
- Chemicals (Chemdex)
- Construction (Buildnet)
- Energy (Altra Energy Technologies)
- Healthcare (Medibuy)
- Metals (Metalsite)
Horizontal intermediaries address inefficiencies within multiple supply chains. These normally centre around a process or service or involve the trade of indirect goods.

Examples include:

- Asset management (Assetline.com)
- Media buying (Adauction, BuyMedia)
- Maintenance and Repair (Commerce One, Ariba, Infobank, PurchasePro, Systemcare)
- Operations (e.g. office supplies) (Commerce One, Ariba, Infobank, PurchasePro)
- Business Travel/Expense management (Concur, Captura)
- Shipping (Seanet, Maritime Global)
- Logistics (Celarix, e-Transport)
- Human Resources (Employease)

The distinction between vertical and functional intermediaries is sometimes blurred, for example vertical industries such as transport or packaging are often able to offer a service across a number of industry supply chains whilst horizontal intermediaries including finance, insurance, asset management and MRO may specialise their offering for specific verticals. This blurring of roles is also happening across the purchase of indirect and direct goods, with vertical marketplaces, including HightechMatrix.com (an initiative between i2 technologies, Compaq and HP) moving into the trade of indirect goods, and Commerce One who is moving into the direct goods space through partnership with a number of application vendors including Adexa (supply management).
WHAT IT TAKES TO WIN

We believe that the following characteristics are desirable for companies looking to create online intermediaries:

• **Domain expertise:** Success in a given vertical requires that companies have significant knowledge of the players, business processes and key inefficiencies in the market. This in turn requires industry expertise at both the management and sales levels of a business.

• **Large addressable, inefficient markets:** Intermediaries that succeed will be addressing not only a large industry sector but also a sector that is either very fragmented (for example print buying) and/or has major inefficiencies (indirect procurement, return loads) and/or one which has a history of poor customer service.

• **Strategic partners:** These are important in gaining critical mass and credibility. Getting large companies in the existing value chain to endorse an intermediary directly (press announcements) or indirectly though use of the site is often essential in building up liquidity within a market. Technology and service partnerships that add value to the core market proposition will also be increasingly important.

• **Reliability and security:** In order to service an increasingly global, business customer base, intermediaries need to offer a robust, scalable, open platform that ensures that the marketplace is available 24x7 as well as being able to guarantee acceptable levels of security.

• **Ease of Use:** A user friendly interface is key in building marketplace liquidity as is the ability of hubs to offer increased functionality in terms of search facilities, customised interfaces and additional tools to streamline trade.

• **Intermediation:** Intermediation strategies (as opposed to disintermediation strategies) will work better in the medium term because of the presence of existing industry structures and the strength of key players.

• **Liquidity:** The winners in trading communities will be those who are able to offer the most liquid markets.

• **Credibility:** Winning intermediaries are likely to be a large or neutral organisations that have a high standing and visibility in the industry sector.

**European winners**

In Europe, we feel the following characteristics are additionally important:

• **Country understanding:** Companies with an understanding of country-specific cultural relationships, for example the way that business is conducted in Germany versus Spain.

• **International adaptability:** Organisations who can address differences in regulations, language and currency on a regional or country by country basis.

• **Market knowledge:** Understanding of current market players.

• **Access to capital**

**Different skills for different approaches**

The primary challenge for vertical intermediaries is in diversifying into other vertical industries, because relationships and expertise are often domain specific. In addition, vertical players will need to build critical mass and differentiate offerings within increasingly competitive vertical sectors e.g. Chemdex.com (unites life sciences enterprises, researchers and suppliers), Chemconnect.com (global chemical and plastics exchange), Chematch.com (trading platform for high-volume, bulk commodity chemicals, plastics and fuel products) in the chemical sector. Vertical hubs servicing the same industry are likely to merge in the longer term as well as expand into offering private parts of a public offering to larger organisations or closed industry groupings.
Horizontal/functional intermediaries on the other hand will struggle to deliver industry specific functionality and content. In order to address this we are starting to see horizontal hubs migrate to a service provider role behind vertical industries, as well as extend service offerings through partnerships. An example of both of these comes from Commerce One who has partnered with Renaissance’s eWorkplace services, (to provide self service, call centre, workflow and enterprise information portals) as well as with Remedy to supply eCRM (electronic customer relationship management) solutions. It has also supplied multiple vertical industries with MRO software and services (GM, Shell, Wellpoint Health Networks, GUESS?).

Horizontal approaches focus on providing the same service/function or automating the same business process across different industries. Their expertise normally lies in a business process that is fairly horizontal and can therefore migrate across vertical markets. The likely success of a functional hub therefore increases with:

- Ability to standardise a process or service
- Knowledge of the process or service
- Ability to customise the process or service across different industries
- Ability to streamline a process and cut end-user costs
- Ability to offer a complete solution

One of the most successful functional offerings out on the market today comes from the MRO sector. These organisations have been able to replicate many of the success factors listed above. They have helped to standardise user interfaces to the procurement system, streamlined the requisition approval process within large organisations and provided immediate cost saving to a company’s bottom line. MRO is a successful model because it is generally highly inefficient and common to all organisations.

Vertical hubs focus on aggregating (Chemdex), exchanging (Metalsite) or enabling (Collabria) the purchase of goods and services which are specific to an industry. Vertical marketplaces require deep domain specific expertise as well as relationships with key industry buyers and suppliers.

The likely success of a vertical hub therefore increases with:

- Domain knowledge and industry relationships
- Greater fragmentation between buyers and sellers
- Greater inefficiencies in the existing supply chain
- Ability to create critical mass of key buyers and suppliers
- Ability to create master catalogues and sophisticated searching.
INTERMEDIARY TRADING MODELS

Intermediaries are currently making use of a number of overlapping models to enable trade and collaboration among business communities over the internet.

Auctions

The Auction mechanism creates value by temporal matching of buyers and sellers, and by matching prices to levels of supply and demand. Auction services can be divided into three main types.

• Bulletin boards: Allow for a central online meeting place for fragmented buyers or sellers. Sellers post offers and buyers bid on these offers through basic email or traditional fax or phone. The bidding period is not defined and bidders are not aware of other people’s bids. Many sites which have started with bulletin boards will move onto interactive auction or exchange formats as the site builds liquidity as the technology matures.

• Reverse auctions: Allow a buyer to post requests to purchase in a structured format, and sellers to bid for supply of the goods or services. This format is especially attractive for the SME market as it allows multiple buyers to club together to negotiate greater discounts from a greater number of suppliers.

• Regular auctions: Allow the seller to post an offer and buyers to bid on this.

ActivMedia projected that $16 billion was spent worldwide in B2B auctions in 1999.

Sectors and Benefits

The auction mechanism works best in sectors of industries that are trading redundant, time sensitive or specialised goods and services for example second hand equipment, unsaleable returned goods, media space, return loads, earth moving equipment. Auction models often work across multiple products or industries and typically in closed or pre-qualified marketplaces. Buyers benefit from a broader supply base, lower search and transaction costs and more dynamic pricing. Sellers benefit from broader customer access, lower transaction costs and a better understanding of market pricing.
Key challenges

The key challenges centre around building liquidity of buyers and sellers and the ability of players using the auction mechanism to extend offers to include post sales customer support e.g. fulfilment, warranty etc. In addition, qualification of buyers and suppliers is a key component needed for open communities. Companies looking at this model will need to remain neutral and will need to build up a wide base of industry specific expertise.

### Table 10: Subset of sites offering auction functionality

<table>
<thead>
<tr>
<th>Marketplace</th>
<th>Industry</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AdAuctions</td>
<td>Media</td>
<td><a href="http://www.adauctions.com">www.adauctions.com</a></td>
</tr>
<tr>
<td>Freemarkets</td>
<td>Industrial components</td>
<td><a href="http://www.freemarkets.com">www.freemarkets.com</a></td>
</tr>
<tr>
<td>Agorum.com</td>
<td>Surplus stock</td>
<td><a href="http://www.agorum.com">www.agorum.com</a></td>
</tr>
<tr>
<td>Allocation</td>
<td>Surplus stock</td>
<td><a href="http://www.allocation.net">www.allocation.net</a></td>
</tr>
<tr>
<td>Mondus.de</td>
<td>MRO</td>
<td><a href="http://www.modus.de">www.modus.de</a></td>
</tr>
<tr>
<td>Outpark</td>
<td>MRO</td>
<td><a href="http://www.outpark.com">www.outpark.com</a></td>
</tr>
<tr>
<td>Portum</td>
<td>MRO</td>
<td><a href="http://www.portum.com">www.portum.com</a></td>
</tr>
<tr>
<td>Printmountain</td>
<td>Commercial printing</td>
<td><a href="http://www.printmountain.com">www.printmountain.com</a></td>
</tr>
<tr>
<td>iMark</td>
<td>Idle assets</td>
<td><a href="http://www.iMark.com">www.iMark.com</a></td>
</tr>
<tr>
<td>Worldparts.com</td>
<td>Automotive</td>
<td><a href="http://www.worldparts.com">www.worldparts.com</a></td>
</tr>
</tbody>
</table>

Source: Durlacher

Exchanges

Online exchanges normally exist in central, neutral locations that offer defined processes for the trading of goods and services between buyers and sellers in known communities e.g. raw sugar, telecoms minutes. These exchanges are replicating what has been developed in industry specific financial exchanges, in the physical market (buyers, trade houses, exporters, producers). This model is more flexible than the auction model and allows both buyers and sellers to make bids and offers for some underlying commodity. Offers can be made at any time and can often be withdrawn or revised. Online exchanges often work to replace or extend existing offline brokers by offering faster transactions with a lower cost of two way negotiation.

Sectors and benefits

Exchange platforms work best in markets where demand and prices are volatile and the products are standardised, commodities (sugar, coffee, tea) or easily defined, such as excess inventory in the semi conductor industry. The reason for this is that these products require minimal direct interaction between the buyer and the seller to explain product characteristics. Buyers benefit from better matches and better prices as well as the ability to hedge risk in volatile markets. Sellers benefit from greater access to buyers as well as the ability to liquidate excess supply and manage volatility. At first, the emphasis will be on building a proposition that will attract the key organisations in each market. Nevertheless exchanges will provide the greatest benefit to the smaller businesses and ultimately that is where a large part of their business will be conducted.

Key Challenges

A key challenge for exchanges will be to build a value proposition that is attractive to the majority of the dominant businesses in the sector and that is easy to implement, with a minimum of up front cost. This in turn will require specific domain expertise to identify key inefficiencies, market structure and key players. In addition exchanges will work to open up market transparency which in turn may lower commissions they can charge in the medium to longer term. This is expected to be counterbalanced by the growth in volumes on successful exchanges, but will put pressure on all players to offer revenue-generating value added services including settlement, credit services, and back-end system integration as additional revenue streams.
Table 11: Subset of exchange sites operating in Europe

<table>
<thead>
<tr>
<th>Marketplace</th>
<th>Industry</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virtual Chip Exchange</td>
<td>Electronic components</td>
<td><a href="http://www.virtualchipexchange.com">www.virtualchipexchange.com</a></td>
</tr>
<tr>
<td>World Wine Exchange</td>
<td>Wine</td>
<td><a href="http://www.wwe.com">www.wwe.com</a></td>
</tr>
<tr>
<td>Band-X</td>
<td>Telecoms</td>
<td><a href="http://www.bandX.com">www.bandX.com</a></td>
</tr>
<tr>
<td>PaperExchange</td>
<td>Paper</td>
<td><a href="http://www.paperexchange.com">www.paperexchange.com</a></td>
</tr>
<tr>
<td>WIRE</td>
<td>Re-insurance</td>
<td><a href="http://www.wire.co.uk">www.wire.co.uk</a></td>
</tr>
<tr>
<td>e-Exchange.com</td>
<td>IT</td>
<td><a href="http://www.e-exchange.com">www.e-exchange.com</a></td>
</tr>
<tr>
<td>ComDAQ</td>
<td>Commodities (including raw sugar)</td>
<td><a href="http://www.comDAQ.net">www.comDAQ.net</a></td>
</tr>
<tr>
<td>AltraEnergy</td>
<td>Energy</td>
<td><a href="http://www.altraenergy.com">www.altraenergy.com</a></td>
</tr>
<tr>
<td>i2i</td>
<td>Energy (natural gas, electricity)</td>
<td><a href="http://www.i2i.com">www.i2i.com</a></td>
</tr>
</tbody>
</table>

Source: Durlacher

Aggregation

Virtual Distributors

Virtual distributors aggregate, standardise and index suppliers catalogues or content and make these available in a centralised location to buyers. As an example, companies such as Commerce One are building up a centralised catalogue of MRO suppliers hosted by the largest telco’s (NTT, BT, Swisscom, Deutsche Telekom, Singapore Telecom, Optus and MCI) whilst players including Ariba have focused on normalising catalogues hosted on a suppliers own website. The Ariba.com network then operates to push customised suppliers data to specific buyers.

At the buyer side, more developed models tend to provide some sort of workflow application or service to help streamline the approval and permissions process within a buying organisation as well as to reflect existing pricing and relationships between larger buyers and their suppliers. The latter requires a fair amount of system integration and is a large part of the sale of players including Ariba and Commerce One. For smaller buyers Commerce One and Ariba have recently teamed up with ASPs (CSF and USi respectively) to host the buyside workflow application and make it available, through a browser interface, to smaller buyers.
Virtual buying organisations

Buy-side aggregation models are often aimed at the SME market and focus on aggregating buyers requests for quote (RFQs) and linking these into a pool of suppliers who are often notified by email and can make bids. Small buyers benefit from the ability to aggregate demand and negotiate volume discounts from suppliers, suppliers benefit from a new source of pooled buyers.

Both virtual distributor and buyer aggregation models tend to focus on either a push or pull principal. Putting the buyer at the centre, push models rely on suppliers pushing goods into a market place and buyers having to select products from a catalogue of new or pre-assigned suppliers. Pull models put the onus on the supplier to respond to specific requests from single or multiple buyers. The Push principal works better with large buyers and pre-qualified suppliers with predefined business rules. It can also be used for the occasional purchase requiring searching across smaller suppliers e.g. Ariba, Commerce One, Infobank but it is often expensive requiring a fair degree of customisation to streamline the buying interface and difficult to build a critical mass of suppliers. The pull principal works better in more fragmented markets or buying organisations (i.e. multiple hotels in a hotel chain) or with smaller buyers, by putting the onus on the supplier to react to RFQs from multiple buyers whilst at the same time allowing buyers to come together to negotiate volume discounts. The pull principal also reduces the cost of aggregating suppliers in distributed or centrally located repositories relying instead on a network of supplier contacts to respond to buyers requests.

Sectors and Benefits

These models are usually used for trades of well-defined products such as maintenance repair and operation goods and services (that have limited price volatility or pre negotiated pricing), and where the supplier or buyer base is fragmented. Buyers benefit most from these models through lower search and transaction costs as well as a broader supply base. Sellers benefit from lower transaction costs as well as a broader customer base. The key here lies with the ability of the model to build a critical mass of buyers and sellers whilst at the same time being able to streamline and support existing trade.
Key challenges

Push models have the problem of building and maintaining a critical mass of suppliers in a central repository. Ariba has addressed this through using a partner, Aspect, to do the initial cataloguing at the suppliers site and putting the onus on the supplier to keep this up to date. Commerce One on the other hand is breaking its repositories up by country and partnering with large PTTs including Swisscom, Deutsche Telekom, BT etc. to help maintain these. Push and pull models must also build up a critical mass of buyers and suppliers so that buyers do not have to go outside the marketplace to find goods and services. The key challenge for successful aggregators will be to sign up large buyers who in turn will bring in suppliers. In addition, push models will need to ensure in the medium term that their repositories of suppliers interoperate with other competitors repositories i.e. Ariba.com with Commerce One’s Marketsite, so that buyers are not limited to specific suppliers and suppliers do not have to maintain multiple catalogues.

<table>
<thead>
<tr>
<th>Table 12: Catalogue aggregation marketplaces operating in Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commerce One (C1) MRO Marketsite</td>
</tr>
<tr>
<td>Ariba MRO</td>
</tr>
<tr>
<td>AutoXchange (Ariba) Automotive</td>
</tr>
<tr>
<td>TradeXchanger (C1) Automotive</td>
</tr>
<tr>
<td>NetBuy Electronic components</td>
</tr>
<tr>
<td>AutoTrader Motoring</td>
</tr>
<tr>
<td>Chemdex Chemicals</td>
</tr>
<tr>
<td>Seafax Seafood</td>
</tr>
<tr>
<td>Hyperchannel IT</td>
</tr>
<tr>
<td>ITnetwork IT</td>
</tr>
</tbody>
</table>

Source: Durlacher

Content

Online publishers aggregate and filter third party content and combine this with proprietary content to attract communities of industry professionals. The key here is the ability of the OI to use content to attract a critical mass of like-minded industry professionals and ultimately facilitate commerce. There are a number of established types of online content available from a number of sources (trade publications, news services, industry repositories, trade associations). These companies are looking at using their content to attract commerce or enhance transactions either through building their own sites or by providing a service behind other vertical sites.

Key content producers include:

- Trade publications e.g. EMAP, Avantel, news agencies Reuters, Bloomberg and specialist publications e.g. Packaging Today offering timely, industry specific news and comment.
- Industry Research Agencies offering online report services along with sophisticated indexing and search technologies.
- Owners of existing company databases including Dun& Bradstreet (eccelerate.com) and Asnef/Equifax, along with startup companies such as Infotel and Informa offering access to these databases for online credit checking services.
- Technical information through links to white papers developed by standards bodies and major vendors.
- Recruitment agencies such as Employease and publications offering access to job seekers and job listings online.
- Major trade associations or industry players who own industry specific databases.
Sectors and Benefits

Communities are viable in any sector that has content which is of interest to a sizable group of like-minded professionals who are prepared to pay for the privilege of access to this content or to the respective community. We believe that a key benefit to a business in the medium term will come from the ability of content communities to index and cross reference material and to use the reach of the internet to generate new content and communication through services such as discussion forums, and user groups. The production of the various vertical market XML schema will assist in this.

Key challenges

The key to challenge for content/community plays will lie with their ability to categorise and streamline content for specific marketplaces, suppliers or individuals, as well as to migrate the model to offer value added services and ultimately facilitate commerce. VerticalNet (an OI that has built up 55 vertical communities), has partnered with Microsoft, IBM, ZillaCast (Webstreaming), Pengroup.com (consulting around e-procurement), PurchasePro (e-procurement platform) and recently acquired NECX (www.necx.com) to migrate its model from content and community to services and commerce. The major challenge that VerticalNet, and its look alikes will face, will be in their ability to convert a huge range of community sites into trading communities, each of which require a significant level of industry expertise. It is this expertise that will be necessary to deliver trading solutions that address key industry inefficiencies and build market liquidity.

Morphing models

We believe that the mechanisms described above are just the starting point and that they will morph over the next 18 months to better address BTB e-commerce needs. In addition we believe that online intermediaries will increasingly make use of multiple trading mechanisms to address the needs of their communities and that this selection will depend on the industry and the type of buying (spot, transactional or strategic).

• We believe that the end game for most content/community plays is to migrate revenues from subscriptions and advertising to services and eventually commerce. We believe therefore that these mechanisms will morph to include auction and aggregation functionality through partnerships or acquisition, or to mutate into services plays behind other communities.

• The relatively static nature of pricing in aggregation models will tend to push these models to include some degree of auction or exchange functionality. In addition we believe that these mechanisms will increasingly look to offer value added services. This has already started to happen with Ariba’s acquisition of Tradex (exchange) and Trading Dynamics (Auction) to build out trading functionality.

• Auction and exchange sites may look to replicate each other’s functionality to address the widest possible trading base. In addition, we expect that auction and exchange sites will increasingly generate dynamic content which will be made available to trading members.
Revenue models
Trading communities are looking to make revenue through a number of models.

Transaction based pricing models
These pricing models currently involve a flat fee per transaction. The size of this fee will vary depending on the type of goods traded, the industry sector, and most importantly the value added by the intermediary. We believe that transaction based fees will be a key component of successful trading communities but that the justification for this fee will mutate over time. To give an example Commerce One currently charges around $1 per transaction that passes through their Marketsite trading community. As the value attached to cost savings from automating purchase orders goes down so the value of this may reduce to 20cents or less. In turn, Commerce One will need to extend the types of business documents that they can trade to include for example invoices whilst at the same time extend the functionality attached to any trade to include for example archiving and data mining tools. Another more generic example is online exchanges that currently charge a small fee for bringing together fragmented buyers and sellers. These will, in the longer term, need to supplement this with the ability to provide settlement, credit checking and possibly even fulfilment in partnership with third parties. In the same way that offline financial exchanges charge different fees for execution-only and broker advice so trading communities will need to link transaction based fees with value add.
Subscription based pricing models

Subscriptions involve a monthly, quarterly or annual fee to participate in a marketplace or parts of a marketplace regardless of the number of transactions. Revenue for the seller is recurring and the model encourages buyer and seller participation. Subscription fees are attractive as they can be received from buyers, sellers or both and represent a relatively predictable revenue stream with high gross margin. Use of this model though, does present a barrier to entry for users, and may therefore be offered in combination with other pricing models possibly for certain sections of the site, for example valuable industry content. This may also be a model that hubs look to in the medium to long term once substantial value has been built into an offering.

Licence based pricing models

Licence pricing models involves an up-front fee on a per seat, per user or per server/processor basis. This pricing is often attractive to large buyers with large transaction volume. Licence fees are recognised up front with recurring maintenance fees built in over time. This pricing mechanism will be attractive to established enterprise application providers and new e-procurement vendors, including Ariba and Commerce One. This model provides high up front revenue to the intermediary as well as potentially high gross margins. In addition these applications tend to ‘lock’ customers in, because of customised user interfaces and back end system integration. The limitations of this model lie in its inability to scale with growth of the BTB marketplace and tend to alienate smaller businesses who are increasingly migrating to a subscription based model.

Advertising based pricing models

BTB advertising revenue can be very attractive because of the targeted nature of the audience. Companies such as CMGI’s online advertising network Adsmart, allow advertisers to buy banner ads across a variety of sites in particular categories. The network focuses on niche categories of BTB sites and charges advertisers twice as much as the Adsmart BTC equivalent. Fees are normally based on the number of advertisements placed, with revenues to the intermediary recognised over a contract period. The limitation of this model comes with its inability to scale with volume and the relatively fixed total size of the potential advertising pie.

Classifying BTB Hubs

![Classification of BTB Hubs](image_url)
1. Vertical Distributors: These hubs are putting industry specific catalogues online with the aim of automating the systematic sourcing process and creating value for buyers by lowering transaction costs. They are increasingly supplementing basic transactions with content and communities that provide advice on who and where products can be best sourced.

e.g. Chemdex, SciQuest, Worldparts

2. Horizontal Distributors: These hubs have generally been built up by buy-side software providers. They focus on improving the efficiencies in the purchase of operations goods and services. These hubs are horizontal in nature and offer network based catalogues of MRO suppliers goods and services. They have tended to focus on building out their platform functionality rather than focusing on content services, and have partnered with “horizontal” third party service providers (e.g. logistics companies) to extend value.

e.g. Ariba, PurchasePro, Mondus, Portum, Commerce One

3. Vertical Exchanges: These hubs address spot buying of direct goods and services, and have focused on providing exchange and auction functionality that enables the trade of commodities or near commodities. Buyers and sellers may not always be known to each other, and therefore these hubs are run by organisations who either know the key players in a given industry or partner with content providers who can provide online company data. In addition, once these hubs reach critical mass they are looking to feed content back into the community on supply, demand and pricing trends.

e.g. E-steel, Metalsite, AltraEnergy, Band-X

4. Functional Exchanges: Many hubs aimed at spot buying of MRO goods have focused on using auction functionality to allow buyers and sellers to scale their operating resources at short notice. These hubs also increasingly offer information on products and companies to help with buying decisions. These hubs tend to be more vertical than transactional MRO hubs and increasingly operate as service hubs behind vertical communities.

e.g. Employease, AdAuctions, Assetline, iMark

VALUE ADDED SERVICES
Dynamic trade is increasingly facilitated by value added service providers that complement or complete transactions. Linking value added services with current intermediary offerings will accelerate and extend the volume of online trade. These services will be particularly important for cross border trade and for trade between small and medium sized organisations. Below, we cover two of the fastest emerging service sectors addressing BTB e-commerce.

Finance
A new breed of service provider is emerging to help organisations of all sizes to manage transaction processing systems. These services have grown out of existing BTC services as well as emerged from parts of the established offline BTB transaction supply chain moving online.

In the US, internet start-ups have been ahead of established offline businesses in launching internet based services. These start-ups have focused on building a number of internet based processes including tax calculation (Taxware), credit card processing in multiple currencies (Worldpay, Cybercash, Cybersource) and online fraud screening (Cybersource). Service revenues are normally generated through a set up fee along with a fee per transaction.

Transaction services are often offered in partnership with large system integrators, platform vendors (IBM, Compaq), commerce application platforms (Openmarket, Intershop, Interworld, Broadvision) and PKI infrastructure vendors. In addition players such as Cybersource are looking at Banks including Barclays to OEM their products.
These services are sold directly into medium and large organisations, and through partnerships with system integrators and application vendors into medium businesses and marketplaces. Sales to small businesses are through telcos (BT, Telia, Deutsche Telekom), banks and established portals (Yahoo! and MSN) who are building up bundled offerings for the SME sector.

Fraud services

Cybersource estimates that between 4.6% and 7.8% of physical product sales on the internet are fraudulent, with this rising to as high as 14.4% to 23.5% for digital product. The risk of identity fraud is highest in the BTC environment where relationships between buyers and sellers are often weak, but the rise of global trade coupled with the growth of auction and exchange sites and vertical marketplaces, has given rise to the growth in many-to-many transactions between business buyers and sellers who may not have traded before.

Established offline vendors in the US and Europe have been slow to understand the requirements of the internet, with risk management services for the internet being developed by start-up organisations instead. Cybersource (launched in 1994 in the US and in Sep 1997 in the UK) offers a fraud screening system that uses artificial intelligence along with an extensive transaction history database from a growing number of merchants (Cybersource is expected to have reached 50 million transactions for 1999 and one billion billable transactions by 2003) to allow merchants to predict and control fraud. The service typically returns a predictive score in under 10 seconds, which the merchant can use to make a decision on whether to accept an order, thereby reducing risk of fraud losses. This service initially addressed fraud in the BTC market but is useful in the BTB market to identify fraud conducted by smaller organisations with a limited credit history.

Credit Checking Services

More recently established credit checking companies have started to realise the huge potential of offering their services online. One of the most significant moves into this market has come from Dun & Bradstreet. This global organisation currently has a database of 58 million businesses worldwide containing information on accounts, credit history, partnerships along with news and analysis. This database is updated through a global network of people making 1000 calls a day. On the 2nd November 1999 Dun & Bradstreet launched a 100% owned start-up subsidiary eccelerate.com to make this database accessible as an online service. Eccelerate.com has partnered with digital certificate authority VeriSign to launch ‘eccelerate’ enabled certificates that allow buyers to get online access to the Dun & Bradstreet database for company credit checks. Fees are based on the type of company information requested. Other database companies in Europe are working with merchants and vertical communities to offer online company credit checks.

We expect that, increasingly, databases of company information may be incorporated into wider company attribute certificates and made available for more sophisticated credit, financing and insurance services in the future.

Bill presentation and payment

Interactive billing services aim to allow large businesses to reduce their operations costs by doing away with paper invoices and sending bills, statements and payments via corporate intranets, email and other web based applications to partners and suppliers.

Companies including EDS (E.solutions), IBM Global Services, Andersen Consulting, KPMG, Unisys and Computer Sciences are all looking to deliver interactive billing services to European Businesses in 2000. The market for electronic billing in Europe expected to reach $3.4 billion by the end of 2000 growing to $12 billion by 2005 (Source EDS).
Partnerships between banks, telecommunication operators, billing application vendors and system integration firms are forming in the US and Europe to address the complexity of the BTB billing market, an example being the alliance between EDS, Bank One and MCI WorldCom. Similar partnerships are expected in Europe over 2000 with global organisations such as EDS opening local processing centres to address data security concerns.

National markets and the SME sector are being addressed by Telcos, an example being Telia (Sweden) who has teamed up with Oracle and Broadvision to offer internet billing and payment services, by leveraging existing telephone customers such as the utilities organisations to provide one unified bill to the customer. Telia is looking to extend this service to include reporting services that allow businesses to receive monthly graphs breaking down company spend. In addition middleware vendors including Tibco and specialist internet billing companies including Portal Software, are teaming up to offer an integrated off-the-shelf solution, that is designed to meet the specialised needs of service providers within the telecommunications industry, including Operational Support Systems (OSS) integration, Billing Support Systems (BSS) integration, mediation and real-time service provisioning.

Logistics

Logistics involves a number of processes whereby products ordered from a website are tracked through the payment process to the warehouse and shipped to the customer. Logistics services include transportation, insurance, duty and regulatory checks and fulfilment. We believe that logistics will become increasingly valuable as transaction costs fall and shipping volumes rise in response to trade across wider geographies and smaller companies. A number of players are starting to help merchants and trading hubs to manage physical and digital product delivery these include online intermediaries (Celarix, iLink Global, GF-X), global distributors (UPS, Fedex, DHL), European postal services (Deutsche Post who has a 25% stake in DHL), national warehousing operations including Bookers in the UK, facility management companies and software vendors.

Fulfilment is intrinsically localised in its effectiveness. Many high profile enterprises in e-commerce had hoped to be able to serve worldwide markets from central locations, but this has proved to be ineffective and has resulted in a territory-specific approach. In response to this we have seen large distributors including UPS and DHL start to build out high tech warehouses in central locations in Europe. These facilities are often incorporated with strategic parts centres in local countries to support logistics businesses in each region. We expect further consolidation between distributors and fulfilment houses, as well as between these two parties and freight forwarders as businesses increasingly look for a single interface for logistics.

Software vendors are also entering the market, offering Internet-based shipping services that allow anyone to price, ship, track and manage shipments over the Internet. One example is iShip.com, which lets shippers compare rates and services among multiple carriers, including UPS, FedEx, Airborne, US Postal Service and Yellow Freight. We expect a slew of third party software vendors to enter the market with sophisticated distribution applications to address the needs of vertical markets.
Fulfilment services include secure fulfilment messaging to simplify the transmission of online orders to distribution centres, fulfilment centres and merchant owned distribution centres. Services handle a combination of message routing, secure email, FTP, and EDI formats. These services also work along side other payment services to comply with card association rules regarding settlement upon product shipping.

Delivery address verification is another service offered by a limited number of companies including Cybersource. These services work to highlight incorrect physical addresses whilst the customer is still online so that discrepancies can be resolved immediately. These services rely on city and state zip codes in the US, with limited country services starting to emerge in Europe.

<table>
<thead>
<tr>
<th>Table 13: Subset of logistics vendors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
</tr>
<tr>
<td>Celarix</td>
</tr>
<tr>
<td>CargoFinder</td>
</tr>
<tr>
<td>FedEx</td>
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<tr>
<td>UPS</td>
</tr>
<tr>
<td>DHL</td>
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<tr>
<td>Deutsche Post</td>
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<tr>
<td>Torget</td>
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<tr>
<td>E-pack</td>
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<tr>
<td>Escalate</td>
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<tr>
<td>EDS</td>
</tr>
<tr>
<td>IBM</td>
</tr>
<tr>
<td>MCI WorldCom</td>
</tr>
<tr>
<td>OrderTrust</td>
</tr>
<tr>
<td>Cybersource</td>
</tr>
<tr>
<td>Shipper.com</td>
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<tr>
<td>GF-X</td>
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<tr>
<td>e-logistics</td>
</tr>
</tbody>
</table>

Digital Logistics

A third area that is being addressed in the logistics space is secure digital delivery of digital product. Currently services are looking to use proprietary technology, digital watermarking, and digital certificates to allow electronic delivery of digital content including software, images and documents. These services are linking up with content distribution networks including Digital Island, Adero, and Akamai who offer a combination of virtual and owned, distributed server networks to facilitate global distribution between businesses.

<table>
<thead>
<tr>
<th>Table 14: Digital content delivery landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
</tr>
<tr>
<td>Operational network</td>
</tr>
</tbody>
</table>
Distribution control services
These services help merchants to comply with corporate, partner and government policies for product and service sales. Export control services allows online merchants to comply with government regulations through monitoring rapidly changing lists of denied countries, individuals and companies and electronically verify a customer’s location using geo-location technology. Policy control services assist merchants in complying with corporate policies and partner marketing and distribution agreements for product sales. Specifically these services allow companies to limit distribution to specific locations in compliance with established marketing, sales and distribution agreements. Cybersource has a strong offering in the US and the UK as do companies including WorldPay and Clear Commerce. The complexity of government regulations across Europe provide a barrier to entry as well as an opportunity for players looking to offer a pan-European Service.

HOW MIGHT INTERMEDIARIES EVOLVE
- Many of the functional/horizontal hubs will migrate to service providers and on to enablers behind vertical trading communities.
- Trading hubs will increasingly link up with value added services offering procurement management, financial settlement and quality assurances that will help participants reduce transaction costs and reach new markets.
- Closed industry hubs in consolidated markets are likely to spin off these offerings into neutral entities that allow all buyers and suppliers to participate.

Durlacher believes that there will be increasing levels of interconnection between separate trading communities so that organisations can source both indirect and increasingly direct goods through a central entry point. As an example we believe that general MRO hubs will link to industry specific hubs and in turn these industry specific hubs will need to link to smaller niche hubs to deliver specialised goods and services. The key to the success of this will come through the ability of hubs to offer sophisticated billing and pricing mechanisms in order to provide users with a simple proposition and a single point of entry, which hides the complexity of the back-end.
There are currently around a 1000 BTB marketplaces globally, with the majority of these in the US. We expect the number of marketplaces in Europe to explode over the next two years followed by consolidation and restructuring (merging of established services and technologies to form new offerings) around leading verticals within four years.

As highlighted in our investment hypothesis the merging of information, services and transactions has the potential to position successful online intermediaries as key players in a new supply chain with high revenue potential. In turn this position is likely to offer investees high returns on initial capital invested.
BTB E-COMMERCE MARKET SIZING

The European market for BTB e-commerce is driven by multiple factors with some of the most important including internet penetration into and within businesses, PC penetration, EDI migration onto IP based networks, pricing and availability of bandwidth, growth of packaged applications and availability of online content and services. Traditionally internet and technology uptake in Europe has lagged the US by up to three to five years depending on the region. Over the past 18 months though, we believe that Europe has started to catch up with the Scandinavian region which is racing ahead of the US in terms of internet penetration per capita.

The penetration of internet into business in Europe is expected to increase from 42 million in 1999 to 77 million in 2004 (white collar workers) with the European Commission estimating that 47% of European organisations were using e-commerce at the end of 1999.

IT penetration within European businesses has also ramped over the past two years both in terms of PC penetration and in the growth of internet and intranets. At the same time the number of business devices that are connected to the internet has also risen. IDC projects that the number of PC's on the internet in small businesses will grow from 45% in 1999 to 66% in 2003. In medium size businesses this is projected to grow from 57% in 1999 to 77% in 2003 and in large organisations this rises from 77% in 1999 to 89% in 2003.

Table 15: Business internet devices on the web: Western Europe

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small business PCs on the Internet (%)</td>
<td>45</td>
<td>52</td>
<td>59</td>
<td>62</td>
<td>66</td>
</tr>
<tr>
<td>Medium sized business PC’s on the Internet (%)</td>
<td>57</td>
<td>66</td>
<td>71</td>
<td>74</td>
<td>77</td>
</tr>
<tr>
<td>Large business internet devices on the web (%)</td>
<td>77</td>
<td>82</td>
<td>84</td>
<td>87</td>
<td>89</td>
</tr>
</tbody>
</table>

According to Durlacher’s projections the market for BTB e-commerce in the Euro-15 will increase from $33 billion in 1999 to $1272 billion in 2004. The BTB e-commerce market will therefore have a CAGR of 107% until 2004.

Figure 22. Source: Durlacher
Durlacher has also made projections on the growth of BTB e-commerce by country taking into account country differences in EDI penetrations, PC penetrations, Internet uptake and factors such as past uptake of new technologies etc. We believe that the countries generating the largest revenues from BTB e-commerce in 2004 will be Germany ($438 billion), UK ($301 billion), France ($149 billion) and Netherlands ($78 billion).

In order to give a more accurate picture of what these represent by country we have broken these numbers down as a percentage of country GDP. As would be expected the Scandinavian region and particularly Sweden is ahead of the pack in Europe in its uptake of BTB e-commerce largely driven through its high internet penetration, fast adoption of new technology and major initiatives such as the recent move by the government to force all suppliers who deal with it to trade electronically. The UK is also an early adopter, benefiting from its position as the entry point to Europe along with its high concentration of electronic trading networks and fast growing internet population. We believe that over the next four years a ramp up in internet penetration coupled with high employee costs in countries including Germany, France and Netherlands will help to drive the growth of electronic commerce and that BTB e-commerce will count for a growing percentage of GDP.
Durlacher estimates that the quantity of revenue moving through intermediaries/trading communities will increase as the market efficiency and scale possible through these trading communities is realised. Once linked together, these trading communities have the potential to offer businesses one-to-many-to-one relationships and the potential for a much more transparent supply chain. Durlacher estimates that $408 billion will be traded through intermediaries in Europe by 2004 accounting for 32% of the overall BTB market and 4.1% of the Euro-15 GDP.

Today the potential market for these trading communities can be guessed at through looking at first movers including Altra Energy which was launched in 1996, has over 2000 worldwide users and claims to trade 40% to 50% of all liquid gas, 10% of natural gas and around 1% of US power. An estimated $9 billion in transactions was traded through the Altrade community in 1999. In the same year FreeMarkets created online auctions for over $2.7 billion worth of excess inventory and equipment and UK based Band-X traded $45 million in capacity in 1999 with an estimated turnover of about £4 million.

Closed trading communities including the Ford-Oracle automotive exchange AutoXchange are also setting the pace with Ford announcing that it had recently conducted a $78 million auction with its Tier 1 suppliers and would be conducting auctions for $300 million in goods per month in March 2000. The potential though is much greater with Ford’s extended supply chain accounting for $300 billion in annual transactions.

In addition to the trading of goods we also expect the online purchasing of business services (recruitment, IT, logistics etc) to grow rapidly over the next 4 years and that many of these will be offered through trading communities who are looking to extend the breadth and depth of online offerings.

The key threat to uptake of online intermediaries will come from the reluctance of purchasing professionals, sales managers, service agents etc to adopt commerce on the internet. We believe therefore that adoption rates will be relatively flat to start with followed by rapid adoption and acceptance as large players in the first wave of adoption drive their suppliers into trading communities in order to save costs. We also believe that adoption will be greatest in industries or sectors of industries where inefficiencies are greatest and competition is high. This in turn will influence the amount traded through intermediaries on a country-by-country basis.
APPENDIX:
CROSS SECTION OF EUROPEAN TRADING COMMUNITIES

AUTIF (ASSOCIATION OF UNIT TRUSTS & INVESTMENT FUNDS)
URL www.investmentfunds.org.uk
Address:
65 Kingsway,
London
WC2B 6TD
UK

Market sector: Finance
Founded: Due for launch June 2000
Status: Private

Key Partnerships: Mutual Fund Technologies Limited
Key Competitors: No direct competitors

EMX Co is a wholly-owned subsidiary of AUTIF (Association of Unit Trusts and Investment Finance). Due for launch in June 2000 the EMX initiative will provide an electronic dealing system for the investment funds industry. It is designed to ensure that all sections of the industry and customers will over time benefit from lower costs, greater accuracy, improved service levels and the ability to process much higher volumes of business. 98 industry investment providers, representing 60% of the industry funds under management in the UK, have signed ‘Statements’ of Intent to participate in EMX. In addition, 6 of the major third party administration firms have committed to the system. The project was originally funded by a group of four major sponsors and AUTIF. Once the system goes live the system should be self-financing through advertising, and service charges, with interim funding of £2.1-£2.4 million being provided through an increase in AUTIF subscriptions.

BAND-X
URL www.band-x.com
Address:
2nd Floor
7 Chelsea Manor Street
London
SW3 3TW
UK

Market sector: Telecommunications
Founded: July 1997
Status: Private
Employees: 25

Key Partnerships: Nortel
Key Competitors: Bandwidth Market, Min-X, RateXchange, Arbinet

Band-X launched the first ever, independent virtual market for international wholesale telecom capacity. The Internet based exchange has extended this initial offering to provide a portal for buyers and sellers of point-to-point circuits, voice minutes, routed IP and co-location space. In addition Band-X offers dig co-ordination services for planning trench digging as well as recruitment services. More recently the organisation launched an additional blacklist service to enable buyers to vet sellers more accurately.
The overall volume of trade in the global telecommunications market is approximately $900 billion per year with online intermediaries largely targeting the $20 - $25 billion global market for spot telecommunications capacity. Band-X has an international membership of over 10,000 and has the majority of telecom companies on their books. The company makes revenues from charging a 1 percent commission of the transaction value of bandwidth provided directly to the buyer, from a third party, or a 5 percent commission if the connection is through Band-X’s own routers. The company traded around $45 million in capacity in 1999 with an estimated turnover of about £4 million and profits of around £250,000.

In October 1999 the company received $11m in equity investment from the Chicago-based venture capital group, Madison Dearborn Partners for an unknown stake in the company. The money is to be channelled into infrastructure upgrades, acquisitions and new products.

BUILD-ONLINE

URL www.build-online.com
Address: Build-Online.com Headquarters.
500 Chiswick High Road,
London, W45RG,
United Kingdom.

Market Sector: European Construction Industry
Founded: July 1999
Status: Private

Key partnerships: Allaier Corporation, Internet Capital Group, MotherNature.com, Silkenet Software, Viant
Key competitors: Bidcom, BuildNet, eBricks.com, Buzzsaw.com

Build-Online is a business-to-business e-commerce site dedicated to the $65 billion UK and European construction industry. Since its product launch in July 1999, Build-Online has signed up over 1,000 construction partners. The company offers a secure online marketplace for the trade of building materials and services, (estimated to account for 65% of total construction costs) as well as a project hosting site to help simplify communication, collaboration and transactions among construction industry players. Services include

- Online supplier catalogues (scanning, updating, downloading service)
- Online collaboration (WebExtra extranet enquiry system)
- Online tender and project management
- Online member trading
  (WebExtra extranet enquiry system but limited trading functionality)
- Online construction community
  (news, employment, construction and e-commerce reports)

Build-Online.com secured first round funding of $2m from BancBoston Capital and Delta Partners, and is planning a further $6.5 million funding in 2000 to fund expansion into Germany, France, Spain and Italy.

Build-Online.com’s membership is free and provides access for news, information and supplier catalogues and e-mail service. The company is looking to generate revenues from supplier postings as well as low fees for transactions carried out on-site and anticipates servicing up to £3 billion in projects and transactions on its UK site by the end of 2000.
**EFDEX**  
**URL** www.efdex.com  
**Address:**  
efdex inc.  
210 Winnersh Triangle  
Reading  
Berkshire  
RG41 5TP  
United Kingdom  

**Market Sector:** Fresh and processed food  
**Founded:** 1995  
**Status:** Private  
**Employees:** 250+  

**Key partnerships:** IBM  
**Key competitors:** worldoffruit, BuyProduce.com, ecFood.com, Instill Corporation, Networld Exchange  

efdex is a global marketplace that is targeting the $11 trillion global food and drink industry. efdex combines extensive content, including market and business reports and live news feeds, with a real-time, web based trading exchange that integrates with customers existing back-office systems. Like a stock exchange, efdex contains all price and product data from suppliers and potential buyers, categorised by type and size of business. efdex will then enable businesses to buy, sell and confirm those transactions electronically using a system developed in partnership with IBM.  

Target buyers include restaurants, hospitality companies, supermarkets and food distributors. Target sellers include growers, co-operatives, agencies and food processors. Membership is free and revenues are generated through a combination of advertising, transaction fees (in the range of 1%) and the sale of market data and analytics (proprietary pricing information that forms the critical indices that help businesses negotiate trades more effectively). The latter is available at a flat monthly rate or on a 'pay as you go' basis and is directly linked to trading.  

The president and CEO of efdex is Ellen Marram who has almost 30 years of experience in the food and drink industry, having served as President and CEO of Tropicana and President and CEO of the $3 billion Nabisco Biscuit Company. The rest of the management team comes out of large industry players and related media and industry publications. The company is organised around national markets and is currently live in the UK with plans for a launch in the US in Q1 2000 and continental Europe at the end of 2000.

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**ELOGISTICS**  
**URL** www.elogisticsglobal.com  
**Address:**  
40-44 Clipstone Street  
London  
W1P 8JX  
United Kingdom  

**Market Sector:** Freight  
**Founded:** 1999  
**Status:** Private  
**Employees:** 5
**Key Partnerships:** KPMG, USWeb/CKS, Oracle, PWC  
**Key Competitors:** Cargofinder, Teleroute, XS.com, Celarix,

eLOGISTICS is a venture capital backed internet start-up who has set-up a marketplace to address the freight procurement market for companies requiring transport and hauliers with excess capacity. The company is using an auction platform to allow buyers of transport services to get lower logistics costs and sellers to drive up vehicle and driver utilisation.

The company is currently piloting its concept with a number of UK and European buyers and sellers, and will generate revenue through a combination of a listing fee and/or commission on all successfully matched transactions, with medium term revenue expected to come from value added services including online payment guarantees, advertising, insurance, recruitment and banking set for launch in 2000.

The company is targeting to have a user base securing £20 billion worth of Road Freight Transactions through its site annually within two years.

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**ENX**

**URL** www.enx.de  
**Address:**  
Westendstr. 61  
60325 Frankfurt  
Germany  

**Market sector:** Automotive  
**Founded:** 1998  
**Market Cap.:** Private

**Key Partnerships:** Deutsche Telekom, IBM,  
**Key Competitors:** AutoXchange(Ford), TradeXchange (General Motors), Worldparts

Following the successful launch of the business-to-business network ENX (European Network Exchange) in Germany and France, 16 European automobile manufacturers and suppliers from six nations, as well as four national automotive associations, have come together to expand the network to cover all of Europe. The respective companies and the associations ANFAC (Spain), GALIA (France), SMMT (Great Britain) and VDA (Germany) agreed in Brussels on 12 October 1999 to bring together their individual projects to develop a European network for the automotive industry. The basis for the second phase of the ENX initiative is formed by the successful pilot projects organised by the individual associations, and the close co-operation at European level in the past. In Germany the industry network ENX is already available in full, with the French automotive industry on the verge of concluding the pilot project and the UK and Spain still in the pilot stages.

ENX provides a virtual private network based on the IP protocol that offers a closed, secure, electronic communications platform over which established players of all sizes can trade. The organisation registers and validates organisations prior to connection, in addition to providing conferencing for distributed product development, file transfer on the basis of OFTP (Online File Transfer Protocol), web applications (CAD, EDI) using browser and Java technologies with direct access to product, ordering and financial data across corporate borders. In addition ENX is looking to extend offerings to include digital signatures and application services.

Revenues are generated through subscriptions and value added service charges.
e-EXCHANGE
URL www.e-exchange.com
Address:
32 Ludgate Hill
London
EC4M 7DR
UK

Market Sector: IT
Status: Private
Employees: 35

Key Partnerships: Broadvision, Xcelerate (exchange SI)
Key Competitors: Hyperchannel, BTC players moving into BTB (Buy.com, eBay and QXL), Large supplier websites (Cisco, Dell etc)
e-Exchange.com operates a neutral, web based, virtual exchange for the trade of PC’s, peripherals and components. e-Exchange currently takes a flat $30 per deal fee, with potential buyers and sellers posting their requirements or products on the portal, detailing hardware, pricing, geographic availability or requirements and so on. Buyers and sellers are then able to search each others database of requirements and products, with the actual identity of the buyer and seller shielded from public view. Only when either party is happy to do a deal do they reveal themselves to the bidders. The service, does not compete with existing IT hardware sales channels (resellers, distributors, corporate sales divisions) instead it seeks to assist these channels to reach new markets, whilst at the same time relying on these companies skills to provide customer contacts and post sales support. To enhance the current trading service e-Exchange is also looking to build up its capabilities to provide security, clearing and shipping and fulfilment services.
The company was founded by Rakesh Gandhi, Tan Kok Hin (ex-MD of Compaq in Asia) and Tim Burrow (ex-electronics industry and MD of Yardley) and has Paul Mahoney (ex MD Olivetti) on its board. The company received initial funding from management and outside investors as well as from Broadvision who negotiated a slice of equity and a percentage of future revenues in return for its customer management software.
The company aims to have 30,000 to 40,000 businesses worldwide using the system at least once a month by the end of 2000 and intends to go public in the next 12 months.

HYPORIUM TRADING HUB (HYPERCHANNEL)
URL www.hyporium.com
Address:
1210 Parkview
Arlington Business Park
Theale, Berkshire
RG7 4TY
UK

Market Sector: IT
Founded: Nov 1997
Status: Private
Employees: 26

Key Partnerships: IBM, Compaq, Novell, Oracle, Axent, Nbase-Xyplex, Equinet
Key Competitors: eXchange, BTC players moving into BTB (Buy.com, eBay and QXL), Large supplier websites (Cisco, Dell etc)
Hyperchannel Ltd. Hyporium™ is a real-time trading hub which allows end users, resellers, distributors and manufacturers to trade electronically over the Internet. Hyperchannel was founded in 1997 with $2.5 million of MRV funding and in January 2000 completed a further $24 million fund raising led by GS Capital Partner III, L.P. and affiliates, (managed by the US investment bank Goldman Sachs), GE Equity, and MRV Communications Inc.

The company has developed a real-time two-tier e-commerce solution for the I.T. channel. The first tier is the ‘Hyporium™ Trading Hub’ which allows manufacturers to provide real-time standardised catalogues which are loaded into massive databases within the hub and are then populated with real-time inventory and pricing by the distributors. As resellers log-on to the hub, they can search for the required products and obtain real-time stock availability together with competitive pricing for the required products or services. A reseller can also see what available credit they have with any supplier from the real-time credit information provided by the distributors. This provides the reseller with a choice of suppliers based on stock availability, price or available credit. The second tier is ‘Hyporium™ Stores’, a software solution which allows resellers to offer a customised interface into catalogues in this trading hub to their end customers. End users will use these storefronts as a means of purchasing products and services and checking status of their orders. The key is not to disintermediate the supply chain but to port it onto the internet.

Revenues are generated through a $3000 per year fee to resellers (first year is free) and a £5 per order fee from distributors, with manufacturers providing system integration and ongoing updating services at their own expense.

Hyporium™ has already launched in the UK, France, Scandinavia, the Netherlands and Germany, with plans to develop into Spain, Italy and Belgium.

**PEFA.COM**

URL www.pefa.com
Address:
Ierse Zeestraat 201 B-8380 Zeebrugge Belgium

Market sector: Fish
Status: Private

Key Competitors: Gofish.com

The Pan-European network of Fish Auctions (PEFA) aims to provide an open marketplace for fish products to buyers throughout Europe. The marketplace was designed to match “over-supply” in Northern Europe together with the large demand for fish in Southern Europe. To realise this goal, PEFA is providing both content and multiple auction platforms (developed in conjunction with the University of Ghent) to match supply and demand. In addition the company is extending its services to include quality checks, finance and insurance services. Target suppliers include producers (fishermen) and agents and target buyers include professionals from fish retail, wholesale, processing and distribution elements of the industry. The marketplace offers buyers direct access to large and small volumes of fish in the most remote ports of Northern, Western and Southern Europe and a far broader pallet of fish products, and suppliers with access to an extended base of buyers.

There are currently around 450 live fish auctions, conducted globally, which form part of a $10 billion global market in trading seafood. Pefa currently operates 8 online auctions across Europe with more coming online over the next two months. Revenue streams include transactions, advertising and value added services.
SYSTEMCARE/REQUISITIONS.COM
URL www.systemcare.com/www.requisitions.com
Address:
16 Earls Nook
Belasis Hall Technology Park
Billingham
Cleveland
TS23 4EF
United Kingdom

Market Sector: engineering MRO + other markets
Founded: 1978
Status: Private
Employees: 60

Key Partnerships: IBM, Progress Software
Key Competitors: Aspect Development, Commerce One, Ariba, Infobank

Systemcare is an ISV focused on developing and delivering procurement and Supply Chain Management (SCM) solutions to the engineering sector. Systemcare offer three main solutions:

• Mfour: its core SCM engine/product which is based on Progress Software’s 4GL and database environment
• Systemcare Outhosting Solutions: ASP-enabled hosted Mfour solutions
• Requisitions.com: B2B e-procurement portal for engineering MRO

As well as a growing base of ASP customers, registered Requisitions.com users (with access to over 500,000 parts in its catalogue) now total approximately 1,500. Major customers include Si3 (Monk’s and Crane Industrial Group), Invensys, TRW, Lucas Verity, Perkins – Caterpillar and British Airways. Systemcare generates revenue through the direct licensing of Mfour, rental of its ASP solution, and on a per transaction basis for Requisitions.com

TRADENETONE
URL www.tradenetone.com
Address:
Kolner Strasse 10b
D-65760
Eschborn
Germany

Market sector: Logistics
Founded: August 1999
Market Cap.: Private
Employees: 4

Key Partnerships: Econeia.com, SAP, Cargobiz.com, Living Systems, Transcare
Key Competitors: Teleroute, XS.com, Cargofinder.com, Celarix, e-Logistics

TradeNetOut is a German company building out a business-to-business logistics portal focused on the road and rail transport sectors. The company offers users access to auction, exchange and catalogue functionality with revenue through advertising and commissions on transactions. In November 1999 the company received $2.5 million from Wellington Partners Venture Capital Funds. The money is being used to finance the development of a website and the acquisition of customers.
GLOSSARY OF TERMS

Affiliate: Companies that provide a web front-end or brand for other manufacturers or retailers goods or services. End users select a product at the affiliate web site, but the sale is actually transacted at the sponsoring merchant’s web site.

Applications: Applications can be divided into software systems that consist of low-level programs that interact with the computer at a very basic level (operating systems, compilers, and utilities for managing computer resources), and applications software (also called end-user programs) which include database programs, word processors, and spreadsheets. Figuratively speaking, applications software sits on top of systems software because it is unable to run without the operating system and system utilities.

Application service provider (ASP): An ASP is an agent or broker that aggregates, facilitates and brokers IT services to deliver IT-enabled business solutions across a network via subscription-based pricing.

Auction: An electronic market, which offer’s sellers products/services to buyers, through a web site with a structured process for price-setting and fulfilment. Web auctions currently map any one of 13 established auction formats including English, Dutch, reverse-bid or sealed-bid processes.

Brick and mortar: An established company with non-web channels (physical stores, printed catalogue mail order etc) as the sales outlet for the majority of its products or services.

Browser: A software program used to locate and display information on an intranet, extranet or the Internet. Browsers are most often used to access web pages. Most browsers can display graphics, photographs, text, audio and video.

Business process re-engineering: Involves the analysis and redesign of business processes and management systems to streamline and improve company performance. Business process re-engineering uses objective, quantitative methods and tools to analyse, redesign and transform business processes including their supporting organisation structures, information systems, job functions and set benchmarks for ongoing company performance.

Buy side: Applications and processes that address how companies buy products and services. Includes requisitioning, product catalogs, approvals, end-user identification, purchase order creation, payment processing and integration to other systems.

Commerce service provider (CSP): Service providers that specialise in internet based commerce services, as well as those offering specific software or outsourcing support for these services.

Content provider: An enterprise whose products are information-based (i.e. content owned or managed for third parties). Content providers often include services to access and manage content.

Customer relationship management (CRM): CRM includes the systems and infrastructure required to analyse, capture and share all parts of the customer’s relationship with the enterprise. From a strategy perspective, it represents a process to measure and allocate organisational resources to those activities that have the greatest return and impact on profitable customer relationships.
**Domain name:** A unique identifier for an Internet site for example http://www.durlacher.com. Enterprises must register top-level domains with the web Internet Registry and pay a yearly fee to maintain the registry.

**Electronic catalog:** An aggregation mechanism (i.e. an online database or databases) that presents goods or services for sale and enables end users to buy goods or services in electronic marketplaces.

**Electronic data interchange (EDI):** The automatic machine-to-machine transfer of trading documents (e.g., invoices and purchase orders) using electronic networks such as the internet. Originally conducted only through value-added networks, EDI is gradually moving to the Internet.

**Enterprise Resource Planning (ERP):** A business management system that integrates all facets of the business, including planning, manufacturing, sales, and marketing. As the ERP methodology has become more popular, software applications have emerged to help business managers implement ERP.

**Extranet:** An IP based network to link an enterprise with its suppliers, customers or other external business partners, and facilitate inter-company communication. Extranets use Internet-derived applications and technology to become the secured extensions of internal business processes to external business partners.

**Hybrid business:** A brick-and-mortar business that has responded to Internet threats by creating a web front end with links to back-end systems; or a dot.com (i.e., a virtual company) that is creating traditional infrastructure (e.g., a warehouse and logistics system) to meet customer expectations.

**Interface:** Something that connects two separate entities. For example, a user interface is the part of a program that connects the computer with a human operator (user). There are also interfaces to connect programs, to connect devices, and to connect programs to devices. An interface can be a program or a device, such as an electrical connector.

**Internet:** A global network connecting millions of computers. Unlike online services, which are centrally controlled, the Internet is decentralised by design. Each Internet computer, called a host, is independent. Its operators can choose which Internet services to use and which local services to make available to the global Internet community.

**Internet Service Provider (ISP):** A traditional definition is a company that provides access to the Internet along with a software package, username, password and access phone number. This in turn allows a business to log on to the Internet, browse the World Wide Web and send and receive e-mail. ISPs are mutating into ASPs and CSPs.

**Maintenance, repair and operations (MRO):** The activities and material purchased to support activities associated with the operation and repair of any facility, equipment or asset. Maintenance and repair goods and services may be relatively industry specific whilst operations goods and services (e.g. computers, travel etc) may span across multiple industries.

**Middleware:** Software that connects two otherwise separate applications. For example, there are a number of middleware products that link a database system to a web server. This allows users to request data from the database using forms displayed on a web browser, and it enables the web server to return dynamic web pages based on the user’s requests and profile.
**Personalisation:** Using automatically adjusted end-user profiles to match content or services to individuals. Personalisation includes gauging an end-user’s interest based on his or her preferences or behaviour, constructing business rules to select relevant content based on those preferences or behaviours, and presenting the content to the end user in an integrated, cohesive format.

**PKI:** A system of digital certificates, Certificate Authorities, and other registration authorities that verify and authenticate the validity of each party involved in an Internet transaction. PKIs are currently evolving and there is no single PKI, nor even a single agreed-upon standard, for setting up a PKI. However, nearly everyone agrees that reliable PKIs are necessary before electronic commerce can become widespread.

**Portal:** A website which uses a wide range of content, services and vendor links to attract a high degree of traffic. Portals act as online destinations that assemble content in a simple-to-navigate interface. Portals typically include services such as e-mail, community, chat and increasingly commerce services.

**Profile:** A definition of customer preferences, behaviours or demographics.

**Sell side:** Applications and services that help companies to sell their products online, including catalogs, transaction processors, payment processors, and supply chain management methods and tools.

**Supply chain management (SCM):** The process of optimising delivery of goods, services and information from supplier to customer. SCM is a set of business processes that incorporate a trading-partner community engaged in a common goal of satisfying the end customer.

**Trading Communities:** Trading communities bring together buyers and sellers in a central online location to trade, using various online mechanisms including auctions and exchanges, in addition to industry content and application services. Trading communities are owned and operated by both large industry players in closed trading networks and by neutral parties in more fragmented open communities.

**Uniform resource locator (URL):** The character string or web address that identifies an Internet document’s exact name and location.

**VPNs:** A network that is constructed by using public wires to connect nodes. For example, there are a number of systems that enable you to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

**Website:** A collection of files accessed through a URL, covering a particular theme or subject, and managed by a particular person or organisation. Websites typically use the Hypertext Markup Language (HTML) to format and present information, and provide navigational facilities that make it easy for the end user to move within the site and around the web.

*Note: For addition internet definitions go to online resource Webopedia*

http://www.webopedia.com
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