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Virtual marketplaces in the chemicals sector: B2B turnover expanding strongly

- In the chemicals industry, virtual marketplaces are becoming increasingly important, alongside distribution through company portals. This demands stronger integration of internal business processes and optimisation of the supply chain from the suppliers through to the customer.
- Many large chemicals companies are already active in several marketplaces. This allows them to shape the online exchanges according to their own requirements in order to gain cost advantages and a competitive edge.
- Sooner rather than later, competition will also compel small and medium-sized firms to increase online links with their customers and suppliers. Competition will become fiercer, particularly in supplier industries, which will have to prepare heavily for e-business.
- In the German chemicals industry total (online) B2B sales look set to expand from EUR 16 bn in 2001 to EUR 25 bn in 2005. In 2010 we expect them to reach EUR 57 bn. That would be roughly two-fifths of total chemicals sales (EUR 142 bn) compared with only 15% in 2001.
- In 2001 only one-fifth of B2B sales in the chemicals sector were transacted on virtual marketplaces. This means that the bulk of the B2B business is done directly between manufacturer and customer, not through a marketplace. From 2005 the ratio should swing in favour of marketplaces; by 2010 their share could rise to 60%.
- We expect online trade in chemicals also to rise considerably in the EU, but its share in total sales will probably continue to lag far behind the figure for Germany, where the chemicals giants are out front in online business.
- Despite favourable sales prospects, the number of chemicals marketplaces will fall, with probably only one-fifth of the present online exchanges surviving. Reasons: economies of scale play big in this business; additionally, the large chemicals companies prefer to use their own marketplaces; quite a number of virtual marketplaces have already merged because of the high investment required in infrastructure, and others have closed down entirely.

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Virtual marketplaces in the chemicals sector: B2B turnover expanding strongly

Electronic business is set to expand further in the coming years, as companies believe it offers substantial advantages for the future. This will involve a radical restructuring of internal operational processes.

In Europe, Germany is the largest e-business market, followed by the United Kingdom, France and Italy. By 2005, turnover in these countries should rise from EUR 170 bn to around EUR 2,300 bn, according to figures from Jupiter Research. But the USA is by far the largest market, with turnover of EUR 780 bn. This is forecast to rise to around EUR 6,300 bn by 2005. The USA should thus remain in the lead worldwide, but with Europe gaining substantial ground. A survey by Cap Gemini Ernst & Young indicates that 54% of Germany's chemicals companies plan to increase their investment in e-business this year; 43% intend to keep it at the same level as in 2001, and only 3% want to cut their spending.

Besides distributing through their portals, companies are turning increasingly to electronic marketplaces. This involves integrating internal operating processes (such as order processing, materials management and accounting) more closely in an overall system of enterprise resource planning (ERP), and optimising supply chain management (SCM) from the supplier right through to the customer.

Large companies tend to establish a presence in a number of marketplaces with very different functions. Private marketplaces, for example, are initiated by an individual company (Bayer, for instance, in the chemicals sector) and are accessible only to its business partners, whereas public marketplaces (e.g. cc-chemplorer) are open to potential business partners. Horizontal marketplaces operate across different sectors (e.g. Econia) while vertical marketplaces are sector-specific (e.g. Omnexus). One aspect that still presents a problem, though, is that standards often differ from one marketplace to another.

Some marketplaces are business-to-business (B2B), others are business-to-consumer (B2C).

E-commerce on the increase

At present, figures for e-commerce activities are still low. Very few operators are making a profit on them. In Germany no marketplace is generating a profit as yet. Nonetheless, it is essential for many firms for strategic reasons that they become involved in this field. The large number of companies turning to this sales channel shows that it is thought to hold substantial growth potential. Only by getting into this market at an early stage can firms hope to reap first-mover advantages. In Germany there were some 185 B2B marketplaces in 2001, compared with 163 a year earlier and only 3 in 1995. Turnover is still relatively low, but we expect double-digit growth rates in the coming years. B2B business is expanding more strongly than B2C. Jupiter Research anticipates that B2B trading in Germany will expand from some EUR 65 bn in 2001 to EUR 950 bn in 2005. Marketplaces are expected to increase their share in total B2B business from not quite one-tenth at present to one-quarter in 2005. This would be equivalent to transactions worth roughly EUR 235 bn. The remainder is handled via the firms' own portals. The volume of B2C business is much smaller. In

E-business investment, 2002

	More	Same	Less
		%	
Electronics/ High tech	67	33	0
Metals industry/ Mech.engineering	55	33	10*)
Chemicals	54	43	3
Auto industry	49	41	8*)
Distrib.trades	36	35	14*)
Companies, total	**56**	**36**	**7*)**

*) No details from remainder

Source: Cap Gemini Ernst & Young

Chemicals marketplaces

Name	Type	Investors	Establ.
cc-chemplorer	Vertical	BASF, Bayer, Henkel etc.	2001*)
Che-Match	Vertical	Bayer, DuPont etc.	1998
Econia	Horizontal	Private investors	2001
Elemica	Vertical	BASF, Bayer, DOW, DuPont etc.	2000
Omnexus	Vertical	BASF, Bayer, DOW, DuPont etc.	2000

*) Merger of cc-markets and chemplorer

Sources: Accenture, Berlecon

2000 turnover in Germany did not even come to EUR 2 bn. Jupiter estimates the volume in 2005 at slightly over EUR 10 bn. Consumers now turn frequently to the world wide web (www) for information, but they use it much less often to make actual purchases.

In B2B commerce there are now several types of virtual marketplace. Some are operated by manufacturers themselves. These are sector-specific, e.g. Elemica in the chemicals sector. Others are independent, e.g. Econia.

The fact that the volume of transactions conducted in electronic marketplaces is still so small presents a considerable problem for the operators. Transaction fees are their main source of revenue. In order to bolster their income, the marketplaces seek to attract as many suppliers and buyers as possible by offering „fulfilment services" as well. These functions, which include transport and logistics, are performed by external services companies or alliance partners and are a major contributor to a marketplace's success.

E-commerce turnover in Germany
- B2B and B2C, % -

	B2B	B2C
2000	92.2	7.8
2001	95.4	4.6
2002	97.0	3.0
2003	97.9	2.1
2004	98.3	1.7
2005	98.6	1.4

Sources: Jupiter Research, DB Research calculations

Phases in the development of chemical marketplaces

The chemicals industry did not move into e-business – with companies integrating e-commerce with their own ERP systems – until relatively late. According to a study by Roland Berger in 1999 the chemicals sector was still at the bottom of the scale in a comparison of major German industries that also included the media, banks and auto manufacturers. The ranking was based on six factors: strategic orientation, integration of e-commerce activities in operational processes, partnerships, as well as content, functionality and marketing of web offerings.

The evolution of virtual marketplaces in the chemicals sector can be divided into three phases. During the first phase, from 1996 to 1999, quite a few marketplaces were set up, but they were mostly merely spot markets for selling surplus production; they were backed by venture capital. In a second phase, the large chemicals companies took things into their own hands. The third phase, from about mid-2001, has on the whole been a time of consolidation, partly because estimates of the volume of transactions that would be concluded in the marketplaces were far too high, and partly because the amount of funding that is needed until the breakeven point is reached is much larger than had been anticipated.

Financing of B2B marketplaces

	%*)
Transaction fees	72
Advertising	42
Membership fees	41
Fulfilment services	41
Information fees	17

*) Multiple answers possible

Source: Forrester Research

First phase, 1996-1999

Many of the first-generation chemicals marketplaces, in which conventional processes were still used to some extent (e.g. fax or e-mail), started as vertical marketplaces, as trade in raw materials and intermediate products mainly takes place within the chemicals industry. Industrial chemicals (e.g. dyes or additives), on the other hand, are traded in horizontal marketplaces. The initially favourable development prospects prompted large chemicals companies to move in very quickly, as seen in CheMatch (operated by Bayer and DuPont). But, overall, turnover remained low.

Number of B2B marketplaces in major sectors world-wide
- 2001 -

Electronics	132
Vehicle manufacture	73
Chemicals	63
Metals trading	50
Textiles & shoes	46
Plastics	31

Source: Berlecon

Second phase, 2000

The year 2000 brought a huge flurry of new marketplaces as large companies in particular recognised the potential for further online links with customers and suppliers. Some firms decided to join up in consortia. For many, this meant a change of strategy, with the goal

now of maximising the proportion of business conducted via these marketplaces. Three examples here are Omnexus for the sale of thermoplastic plastics, cc-chemplorer for industrial requirements, and Elemica for trade in basic and other chemicals.

Consolidation phase since 2001

In the general internet euphoria, the growth potential of chemicals marketplaces had also been overestimated. Many in fact failed to achieve the necessary number of revenue-bringing transactions. There were problems with staff training and with the necessary standardisation, of products and prices, for example, and of the technological interface between marketplaces and the software used within the companies. The necessary investment in infrastructure requires huge amounts of capital. It is highly doubtful whether sufficient capital is currently available to all virtual marketplaces. Accenture estimates that, at most, 20% of the German marketplaces will survive the consolidation phase. At present, 82% of chemicals marketplaces are still independent, but these are likely to be ousted increasingly by sector-specific exchanges. The outlook for the 40 to 50 independent marketplaces for raw materials seems particularly bleak, as the large chemicals concerns prefer to use their own marketplaces. Some marketplaces have merged and some have given up completely. Others are seeking to reshape their business towards becoming internet-service or technology providers. In addition, e-hubs are being formed to link separate marketplaces.

Advantages for companies ...

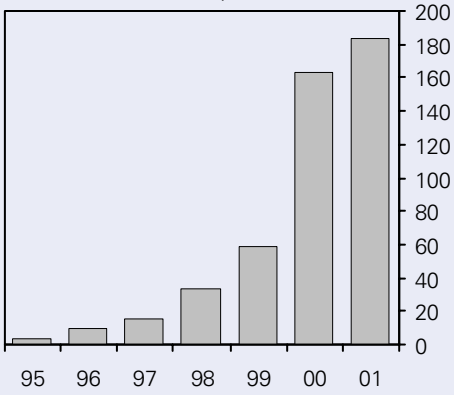
The internet makes it easier for companies to find new customers and suppliers around the globe, and to identify potential partners for business alliances. This is speeding up the globalisation of the markets – in some cases with substantial advantages for companies. Both large and small chemicals firms can benefit. Theoretically, every firm can get on the web and gain market access even without a wide distribution network. Recently, though, companies have shifted their sights in their e-business activities. They now aim primarily to improve efficiency and to cut costs, whereas in 2000 market expansion and customer relations still had top priority. But the majority of companies are not yet satisfied with their e-business results: only one-third have so far achieved their operational goals. In the chemicals and pharmaceuticals industries the companies are mainly critical of the length of time it takes until e-business significantly bolsters the bottom line.

Cost savings thanks to e-procurement

On the procurement side, chemicals companies benefit from the greater market transparency. This makes it easier for buyers to find a more favourably priced offer and thus save costs. In a survey by KPMG it was found that roughly 80% of the time spent on procurement went into buying „C goods", i.e. items that are of only indirect importance for the actual production process (such as office materials, maintenance and repair tools, hygiene articles). But such goods make up only one-fifth of a company's total procurement volume. Costs here can be reduced considerably by altering the technical procurement procedure. By contrast, raw materials and semi-finished goods that are used directly in the production process („A goods") make up about 70% of procurement in value terms. But they require only one-tenth of the total time. Chemicals firms can save here by optimising their choice of suppliers and using the latest technological means.

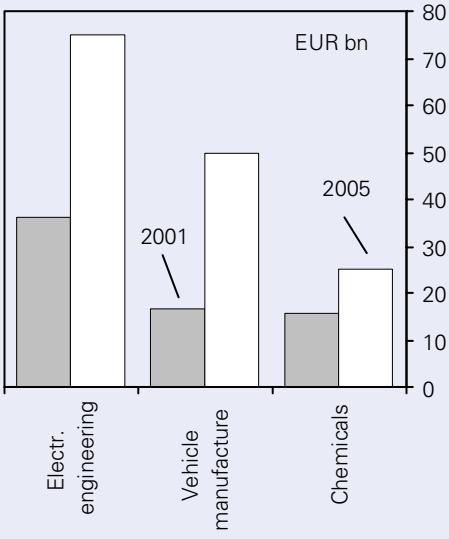
German corporate investment in B2B marketplaces

- number of marketplaces -



Source: Berlecon

B2B turnover, by sector in Germany



Sources: Forit, DB Research calculations

Companies benefit from greater market transparency

Chemicals firms with low buying volumes, for instance, can use a marketplace to bundle their orders in pool-buying options as a means of obtaining better terms. Or, a company can publicise its requirements and interested suppliers can submit their bids anonymously in what is known as reverse auctions. One large German chemicals company said it was able in this way to slash the cost of packaging in one segment by nearly 70%. In less spectacular examples the net cost savings came to 2% on average.

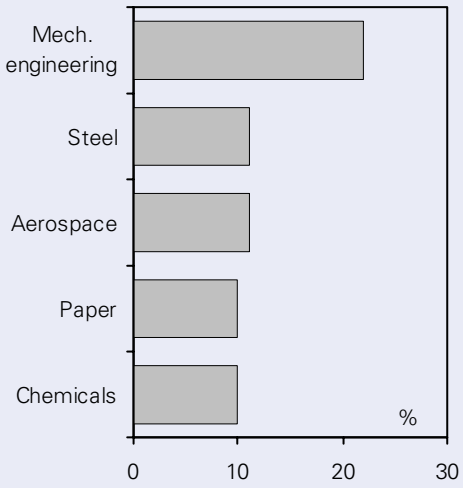
Invitations to tender, auctions, and fixed prices are also found in the chemicals marketplaces. At online auctions in a chemicals marketplace with German participants, the buyers saved between 5 and 25% compared with listed prices. In Europe, 35% of companies already take part in online auctions when buying basic chemicals.

More possibilities through enterprise resource planning

Besides matching up buyers and sellers, many marketplaces also provide fulfilment services. The main purpose of these is to make a marketplace more attractive. These services include checking the creditworthiness of participants, controlling the quality of products, logistics and transport. In 2000 close to 50% of marketplaces offered at least one additional service; a year later the figure was already nearly 60%. The most important factor is the link with a company's ERP (accounting, materials management etc.). The integration of these systems greatly increases efficiency as it speeds up procurement considerably. Particularly in the case of recurrent purchases, automated procurement is a great boon. Integration makes it possible to build up supply chain management (SCM) with important business partners, from suppliers right through to the customer.

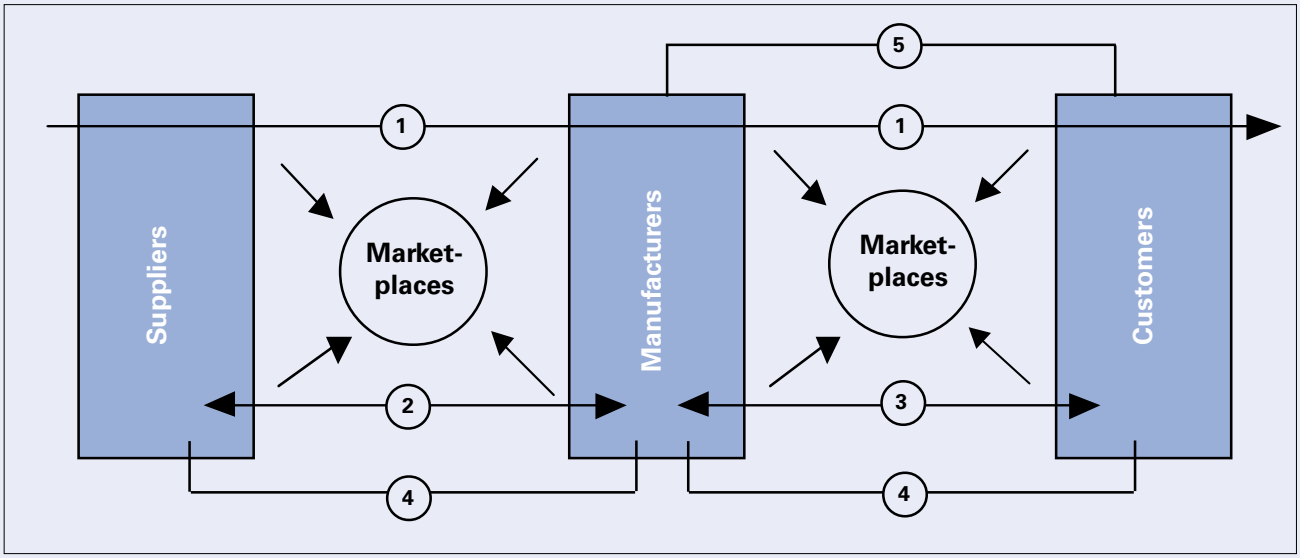
Bundling of orders makes procurement cheaper

Estimated cost savings due to internet, by sector in Germany



Source: OECD, 2000

E-business



1 Supply chain management
2 E-procurement
3 Customer relationship management
4 ERP system
5 Direct sale

Sources: Bayer, DB Research

Supply chain management

Goal: to speed up procurement

In a survey conducted by Boston Consulting among nearly 2,500 European companies in total, over 80% of respondents stated in mid-2001 that they planned to use online SCM in the long term. In the chemicals industry this involves the coordination of procurement, production, logistics and distribution, which enables companies to optimise the production process and keep inventories to a minimum. However, it requires an unimpeded flow of information along the whole supply chain and agreement among the participants on common standards.

Customer relationship management

CRM more important than winning new customers

Customer relationship management (CRM), which seeks to improve customer service and strengthen customer loyalty, is likely to be a dynamic area. For many chemicals firms, optimising their CRM is more important than winning new customers. When a customer places an order, the system first provides a status report on that customer. Next, the distribution system checks the availability of the wanted item. If it is in stock, transport capacity is booked in order to make delivery without delay. The invoicing process is initiated at the same time.

Purchase prices can be greatly reduced

All in all, such systems as described in the paragraphs above make it possible, according to OECD estimates, to reduce purchase prices by up to one-tenth and processing costs by one-fifth. Online procurement also enables companies to operate with leaner inventories.

... but at high cost

Services not yet being fully used

The advantages of B2B marketplaces are now undisputed, but the high costs are a major obstacle, especially for small and medium-sized enterprises. The necessary investment in technology and training is particularly expensive. One large German chemicals company, for instance, spends EUR 40 m each year on e-commerce applications. In addition, a fee of 2% on average has to be paid on each transaction. Membership fees and payment for additional services provide the online exchanges with further income. Some chemicals companies are not prepared to pay so much money merely for brokerage, especially in the case of large orders. Many firms register in marketplaces but do not yet make full use of their services because a large proportion of the industry's feedstock is supplied on the basis of long-term contracts.

If more business is to be conducted online, companies' different software will have to be harmonised to achieve global connectivity with the fewest possible incompatibilities. Many companies are currently seeking with electronic data interchange (EDI) to link up older systems and databases that were developed specifically for the user's needs. This is expensive.

Another major obstacle to increased emphasis on e-business is that, while work procedures must first be standardised and automated (e.g. product descriptions and article numbers), employees do not have necessary skills. In addition, the management of many firms lacks the will to make trenchant structural changes.

Volume of B2B turnover set to rise further

Despite these disadvantages, the volume of online turnover in chemicals marketplaces should continue to expand strongly, as the benefits to the participating companies far exceed the costs. Growth could even outstrip the average for the whole of the manufacturing sector in future.

Chemicals industry in Germany

	2001	2005	2010
Sales, EUR bn	109	122	142
thereof in:			
B2B, EUR bn	16	25	57
%	15	20	40
thereof in:			
marketplaces			
EUR bn	**3**	**12**	**34**
%	**20**	**50**	**60**

Sources: Forit, DB Research estimate

Business-to-consumer (B2C): very small role

In the chemicals industry as a whole, B2C business plays practically no part. The only important area is the pharmaceuticals business between pharmacies and consumers. E-trade in medications already exists in the USA, Switzerland and the Netherlands. Medicine can be ordered online but is only mailed to *bona fide* patients in return for a prescription. The Dutch internet pharmacy DocMorris estimates the total sales of all pharmacies in the EU at around EUR 100 bn and puts the proportion of online business at 5%. Some 40,000 customers in Germany have already bought from DocMorris. The company gets round the German law prohibiting *Versandhandel* in medication by having the customer – not the company – arrange for delivery of the goods by courier. This practice, however, is considered illegal by ABDA, the umbrella association of German pharmacies. The German courts disagree on the matter: while the Berlin regional court decided in favour of the internet dealer citing the freedom of goods trade within the EU, the regional court in Frankfurt am Main ruled against him. The Frankfurt court reasoned that DocMorris infringed Germany law, which forbids commercial mail-order trade in medicines. The case is not closed as DocMorris appealed against the decision, but it is pending until a final ruling is handed down by the European Court of Justice. A decision is not expected before 2003.

Cost savings through internet pharmacies

In Germany, more and more institutions in the health sector are in favour of online trade in medicines, mainly because it could greatly reduce costs for the statutory health insurers. For this reason, 31 statutory health insurers have teamed up in an „initiative for mail-order trade in medicine". Internet pharmacies that, like DocMorris, sold medication at prices up to one-fifth cheaper than conventional German pharmacies, would save them almost EUR 1 bn each year, and this would ultimately benefit health plan members. The cost of bringing a drug from manufacturer to patient is higher in Germany than anywhere else in Europe, according to the German association of company health insurers. Owing to the high mark-ups of the wholesalers and pharmacies, which in Germany are fixed by law, distribution accounts for two-fifths of the entire cost of a drug, compared with only 30% in France and an even lower 25% in Sweden – figures which are otherwise somewhat surprising in view of the low population density in these countries.

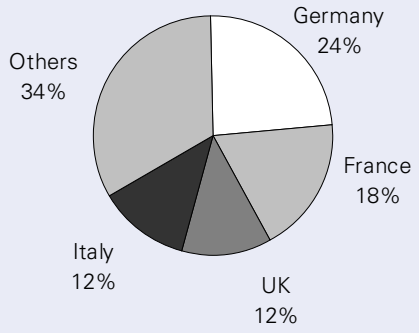
Rising number of online users

Recently, Germany's council of experts in the health sector and the health minister expressed themselves in favour of permitting mail-order pharmacies. However, generally recognised quality and safety standards have to be created first. Online trade in drugs will hardly become fully functional until there is an electronic prescription. Once the prohibition on mail-order trade is lifted, as will likely happen within several years, online trade in medicines is expected to put considerable pressure on pharmacy margins. The pharmacies are opposed to online mail-order trade for this reason. They fear that the regulation on medication prices, which guarantees them fixed margins, will also come under attack. The pharmaceuticals industry also wants the legal situation to be retained in order to prevent, for example, cut-price offers of medication.

However, both the pharmacies (through their business association) and the pharmaceuticals wholesalers in Germany moved into online business in the first half of 2001. Customers can now order medicines on special portals. As yet, though, the patients have to collect the preparations at a pharmacy of their choice, where they also hand in the doctor's prescription.

A study by Forit shows that in Germany B2B business currently generates about 15% of total chemicals turnover (EUR 16 bn out of EUR 109 bn). About one-fifth of this, or close to EUR 3 bn, was handled in e-marketplaces in 2001. This means that the bulk of B2B business in chemicals is done directly between the manufacturer and the customer, not through a virtual marketplace. By 2005 we expect the B2B portion of total turnover to rise to 20%. Assuming that chemicals sales rise at an average annual rate of 3%, to EUR 122 bn, this would be equivalent to nearly EUR 25 bn. About half of this (EUR 12 bn) should then be through marketplaces. From 2005 the ratio swings in favour of marketplaces. According to our forecast, the total B2B share in turnover could increase to 40% by 2010. That would be almost EUR 60 bn (assuming 3% annual growth in the chemicals sector), and about EUR 34 bn of this would be handled in virtual marketplaces.

Chemicals turnover in EU, by country



Source: Verband der Chemischen Industrie

The EU chemicals industry has a world market share of just under 27%, much the same as the USA. In the EU as a whole, B2B represents a lower percentage of total chemicals turnover than in Germany. We expect online trade in chemicals in the EU also to rise considerably in the coming years, but the B2B share in total turnover will probably still lag behind the figure for Germany, where the chemicals giants in particular are out front in online business. The same applies to the share of business conducted in virtual marketplaces.

Outlook: chemicals companies pursue comprehensive strategy

Motive: efficiency gains

The main motive spurring companies to use e-business systems is to reap the efficiency gains – from a reduction in transaction costs, for example – which they hope will result from migrating online with business processes. Many companies do not move onto the web in one step, though. According to management consultants A. T. Kearney, a firm goes through five stages, starting with intensive use of e-mail, setting up its own website, employing e-commerce, then e-business and finally a highly integrated e-business network.

Prevention of anti-competitive market power

Within the e-business life cycle, virtual marketplaces are currently undergoing a phase of consolidation that is likely to last until 2004. Although the prerequisites – both organisation and infrastructure – are increasingly being established by market participants, it will probably be at least another five years before large numbers of providers and customers for goods and services are fully linked via the internet, i.e. before there is a real digital economy. Competition will become fiercer, especially in supplier industries, which will have to prepare heavily for e-business owing to the changed environment. Firms that do not keep up here will only be able to survive in future as niche providers, and will otherwise be forced out of the market. Existing suppliers fear that buyers may gain increased clout by joining forces in the marketplaces. However, the cartel watchdogs in the US (Federal Trade Commission) and the EU are keeping a very close eye on the emergence and behaviour of marketplaces in order to prevent any build-up of anti-competitive market power.

Large chemicals companies well prepared

The large chemicals companies are already potentially able to use e-business. Not only are their own production, logistics and distribution systems linked internally, they are also connected to the ERP systems of customers and suppliers. This means, for example, that orders can be processed world-wide and around the clock via the internet.

Corporate strategy

Chemicals companies: involvement in several marketplaces

Many large chemicals companies are already active in several marketplaces. This allows them to shape the online exchanges according to their own requirements. Generally speaking, though, the chemicals giants are pursuing a comprehensive strategy which they hope will ensure their cost leadership, and hence a competitive edge, over the long term. By combining the different possibilities they can easily select the optimal instrument for every customer or supplier relationship and this results in efficiency gains for both sides. System-to-system solutions that automatically connect companies with their business partners' IT systems continue to play a major role in the chemicals sector. For instance, they provide information on customers' stocks and, when appropriate, automatically signal the need for further deliveries. The coming years will see strong expansion of the business processed in virtual marketplaces (as indicated by the business transacted by BASF and Bayer via Elemica), with system-to-system solutions playing an integrated part. Companies also trade their products and services online through their own individual extranet, a website that is accessible only to selected business partners. One German company, for example, generates one-fifth of its total turnover in one basic-chemicals segment through its extranet. This system is to be used more heavily in the coming years, especially in business with large customers. Extranets, too, can be easily connected with system-to-system applications.

Growing connectivity of small chemicals firms

Sooner rather than later, competition will also compel small and medium-sized chemicals firms to increase their online links with customers and suppliers. This should help them to defend their market position against large companies. Strategically, though, it will make more sense for the smaller players to join established marketplaces rather than go it alone. It can be said quite generally that companies will only be able to exploit the full technical potential of internet trading platforms if management applies the technology to carry out thorough restructuring.

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