B2B In Asian Chemical Industry

By

Minji Kang

THESIS

Submitted to
School f Public Policy and Global Management, KDI
in partial fulfillment of the requirements
for the degree of

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ABSTRACT

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Maximized profit with minimal input; this is the foremost and eternal goal of business sector in capitalized society. Internet-savvy business people, in 21st century, have sought for the solution of continuous hunger for achieving efficiency in workflow and cost saving in the networked economy. Reducing marketing cost, saving telecommunication expenses, expanding new opportunities to new customers, accomplishing price transparency, and most importantly, controlling the whole process of business flow from production, sales to payment through networking individual companies' back-end system were believed to be finally achieved through a magic tool, internet business.

Unlike people's expectation, however, the B2B concept itself is unfamiliar to most of the people and employing this new tool in such a conservative industry as chemical industry is being challenged in many facets. Many start-ups have been sprouted, but couldn't survive long. Most surviving B2Bs are also struggling and continuously being tested about their viability.

New business models are continuously emerging without a strong confidence. We will see how this new industry would evolve, whether or not this would be developed as a powerful tool to be able to replace the inefficient offline trading practices after all.

ACKNOWLEDGEMENTS

It has been really hard to finish this little piece. I've never imagined me myself writing a thesis right before the deadlines. Deadline, this is what I really need in my life. Overwhelming workload pressed me hard in my new workplace thus I felt I would never be able to finish writing thesis and working at the same time. I'm finishing anyways...

Well, I truly appreciate professors in KDI School for not pushing me too much to finish writing my thesis, especially Prof. Seung-Joo, Lee. And, I thank Prof. Hun-Joo, Park, for letting me switch my focus of major from IR to SM without much trouble.

And, most importantly, I truly appreciate all the management people and staffs in ChemCross. com to understand me and cooperate in researching.

Lastly, I send my gratitude and much affection to my family to support me and trust me in all times.

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1. Introduction

1.1. Background and purpose of the research

Given the attention that many investment banks and research institutes have placed on the potential growth of e-commerce in 1999, numerous vertical B2Bs have since been established. With this hype in the B2B industry, computing and electronics industry, utilities industry, automotive industry, and petrochemical industry were considered the most appropriate industry group for B2B.

However, this rave toward B2B has been cooled down since April of 2000. It was with decline of overall technology stocks, especially Internet stocks in general, since bubble in the Internet industry has burst and only viable companies with core competence have been proved to be able to survive. The burst of the bubble in internet stock was mainly caused that expectation toward revenue creation was destroyed. A plethora of B2Bs which lack offline background and customized service for specific industries couldn't attract investors' attention. People didn't think these B2Bs could immediately get offline companies any real-value such as back-end integration and supply-chain-management. Rather, it is expected to take some more time. The harsh environment B2B companies are facing was not actually from their own fault, rather they were scapegoats of a lot of failures in B2C industry. Whatever the main reason was, we cannot help but realize that it is not as easy as it was viewed to attract conservative industry players to this unfamiliar business.

Especially in the chemical industry, major players still remain reluctant to participate in online trading and are hesitant to be the first movers of this trend, though most of them agree that the business is headed in this direction. Meanwhile, however, new business models and

new directions for winning B2Bs are continuously being set and revised.

Through this research, I would like to forecast a future direction of chemical B2B market and to suggest a winning business model in this industry. In doing that, I will review a broad picture of B2B environment. I will also thoroughly diagnose current problems and future potential both in online and offline chemical industry.

For this purpose, a variety of business models and different type of business schemes will be addressed. Also, many actual success and failure cases will be introduced. Lastly, through an in-depth case study of ChemCross.com, which is the largest chemical B2B in Asia, I will discuss the main stream of Asian chemical B2B and compare the winning model.

1.2. Research methodology

For conducting this research, various types of literatures were reviewed in order to inspect the previous and the current e-commerce industry in a more objective and insightful way. The sources include some academic literatures of B2B studies, a series of seasonal and annual reports of several renowned investment banks and volumes of business magazines.

This research includes qualitative analysis and review based on investigation of diverse chemical B2B sites. Several theoretical insights were produced based on comparative analysis of these B2B sites.

Most importantly, to write an in-depth case study of a chemical B2B site, a series of interviews and discussions were conducted with the management of ChemCross.com and

with the leaders of the chemical industry during the last six months. The interviews and discussions were held in an informal environment. The topics included chronological development paths of chemical B2B industry and of ChemCross, operational achievements, the organization's dynamic change, the response to the changing environment, major hurdles to jump as an representative industry-consortium type of B2B in Asia, and lastly, their own view toward winning strategy in chemical B2B industry.

1.3. Organization of the paper

Through this research, by reviewing a broad picture of B2B environment, by thoroughly diagnosing current problems and future potential both in online and offline chemical industry, I would like to forecast a future direction of chemical B2B market and suggest a winning business model in this industry.

For this purpose, a variety of business models and different type of business schemes will be addressed. Also, many actual success and failure cases will be introduced. Lastly, through an in-depth case study of ChemCross.com, which is the largest chemical B2B in Asia, it would be possible to study the mainstream of Asian chemical B2B and compare the winning model.

2. Overview of Chemical B2B

2.1. Global B2B Trend in 1999 - 2001

A market research firm Gartner Group expected that on-line B2B transactions volume in Asia will reach $270 billion by 2003, which is about 20% of the worldwide total. Having experienced the fast growth of internet business in a so called B2C market and a number of research institutes' positive forecast toward e-commerce, numerous number of B2Bs have been sprouted in a short period time last year.

The entry barrier was relatively very low and a lot of entrepreneurs were able to get enough funds from venture capitalists and investors when everybody rushed to a goldmine so called 'B2B' industry.

When there was a hype for e-commerce in 1999 and the early 2000, when Ventro of Chemdex group, an online marketplace for the life sciences industry, went public in July 1999, Chemdex had revenues of less than $200,000 and a market value hovering around $1 billion. Three months later the company's value soared to more than $3 million. [1] But in November 2000, Ventro announced the termination of its operation as the share prices of internet companies began to plummet during the spring of 2000, along with the overall decline in the technology stocks. The stoppage of this B2B pioneer was truly a shock and discouragement to many people in B2B industry itself and investors as well.

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[1] Mercury News By Elise Ackerman, august 21,2000
http://www.mercurycenter.com/svtech/news/special/dotcom/docs/b2b082100.html

Table 1. Diagram of stock price changes during the period for selected companies (See Addendum)

Upon the general assumption that capital investors and NASDAQ stock price are the most representative barometer of diagnosing the dynamically changing B2B trend, B2B environment seems to face very miserable situation according to this graph.

The main hurdle blocking B2B industry from booming is people's set of mind. "People aren't accepting it as rapidly as folks had hoped," said Steve Grana, CV Therapeutics' director of finance. [2] Especially Asian people are already set in their current ways of business like making a lot of phone calls and ordering by fax, thus they are very reluctant to try a new scheme. Very few people in the industry are ready to lead a new way despite that their workflow is full of inefficiency and unproductiveness.

These B2B companies since 2Q of 2000, by failing to induce enough amount of liquidity, have been looking for other types of business services like offline business consulting or feeding customized valuable offline market information. Or they continuously shift their business models into more viable ones by playing niche or providing another source of revenue. Also, to make both ends to meet, most B2Bs are streamlining operations by cutting back on marketing expenses and laying off employees besides fine-tuning their business models.

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[2] By Paul Elias

Red Herring No. 94 March. 20. 2001

2.1.1. Classification of B2B E-Commerce Business Models and Their Examples

A. Marketplace hub

The eventual shape that most of the founders in B2B e-marketplace expect would be very similar to that of a cyber stock exchange in financial sector. Real-time trading by multiple number of anonymous sellers and buyers in one cyberspace would be the image people are in pursuit of in e-marketplace hub. This is believed to offer a chance to be accessed to the new customers and save marketing and communication costs. Also, active trading in this way would bring price transparency to the industry.

Key enabling characteristics to achieve this ideal type of e-marketplace are maximum liquidity and common transaction standards shared by most people in the industry. Also, just like stock exchange, marketplace' neutrality is one of the key fundamentals too.

However, the scale of liquidity in chemical trading is not yet comparable to that in financial sector. Hence, some analysts claim that today's fragmented and illiquid individual e-marketplaces will consolidate into a relatively small set of mega-exchanges that will occupy the center of the B2B universe basically because scale and liquidity are virtually important to efficient trading.

A 1. Exchange

A 1-1.Third-Party Exchange -the first wave

In the United States, most of the B2B e-marketplaces launched in early stage came from

outside the industries they served. [3]. Such chemical B2Bs as Chematch and Chemconnect, were established by venture capitalists and entrepreneurs at the initial stage even though they induced many chemical companies as shareholders later on.

These third-party exchanges, besides general benefits exchange model can provide, have 'neutrality' as a core competence. As a pure third-party exchange, chemical players think they can get fair chances which anybody else can get and they don't have to worry about critical information leakage of their own.

Nevertheless, it is a dilemma that these intermediaries have been struggling to build sufficient trading volumes. Without any commitment from business members, liquidity to reach to critical mass is far-fetched. Being like a house without a landlord, these third-party exchanges are not visited by many players. In a harsh environment, these third-party exchanges spend much more than they earn. To illustrate, Chematch's burn rate hovered at about $2 million until early 2001 although they try hard to save costs by narrowing down its business coverage from worldwide to US-specific and laying off overseas employees. In the case of Chemconnect, the company acquired Universal Chemical Brokerage, which is an offline brokerage company serving the spot petrochemical market, and brokers deal primarily via telephone instead of using online. Chemconnect hopes that some of this offline business will be lured to online.[4] However, this is very dangerous because this can be a trap that e-

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[3] 'The Asian difference in B2B' The McKinsey Quarterly 2000 No. 4: Asia Revalued

by Rajat K.Dhawan, Ramesh Mangaleswaran, Asutosh Padhi, Shirish Sankhe, Karsten Schween, and Paresh Vaish

[4] Chemconnect, Chematch Upbeat By Esther D Amico

commerce should permanently depend on offline brokering company instead of being able to stand on their own legs.

As we see in this case, marketplaces thus confront a massive "chicken-and-egg" problem. They must show that they can provide real economic value-something that will require them to achieve scale volumes. But those volumes can be achieved only if suppliers and buyers invest to integrate their systems and to manage the change process actively in their buying organizations, and they won't be willing to do so without proof that the effort will be worthwhile.

A 1-2. Consortium-Based Vertical Marketplaces (CBVM)10 -the second wave

(* Here I borrow the word 'CBVM' [5] from a renowned journal and it is defined as follows: a joint venture among industry incumbents, with the ultimate goal of improving their performance and that of the industry as a whole.)

In the second wave of B2B, the large incumbents banded together into consortia with their current trading partners and competitors. Whileas the independent third-party exchanges faced many hurdles since they had to gather multiple suppliers and buyers with no direct connection to the e-marketplaces, such B2Bs as Covisint, Transora, E2 open, Aviation X and

[5] The McKinsey Quarterly, 2001 Number 2 On-line tactics by Dennis A. Devine, Christopher B. Dugan, Nikolaus D. Semaca, and Kevin J. Speicher

Elemica with back up by the industry were born with silver spoons in their mouths. [6]

Other than general benefits all the B2Bs claim to have as cost saving, offering price transparency and providing a chance to meet new customers, CBVMs has a distinct differential that they are backed by industry, so that these industries have committed a certain amount of transactions.

In spite of this industry back up and pre-commitment from shareholders, however, the reality for CBVMs is that they are also struggling to reach to a critical mass for active transactions on their marketplaces. Unfortunately, the consortia, like the independent marketplaces, have generally failed to realize the hopes of their founders. Then, should we conclude that B2Bs, regardless of the type of business model, cannot be successful? Or is it right to attribute all of these difficulties and failures to immature e-commerce environment? In order to figure this out, it's necessary to diagnose what caused these failures.

First of all, we should note that mega-funded projects by only a limited number of participants the amount of which invested capital is huge, have difficulty gathering enough number of players in the marketplace. On the other hand, those mega-funded projects with many shareholders also struggle because each individual shareholder's invested capital is small volume even though the total capital is relatively immense. In many cases, it turns out, the members of the consortium didn't shift as much of their volume to as it had been expected, so the liquidity that their participation was supposed to guarantee didn't materialize.

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[6] The McKinsey Quarterly, 2001 Number 2 On-line tactics by Ken Berryman and Stefan Heck

Second, even though we admit it would be easier for these CBVMs to operate business at the initial stage comparing to other independent exchanges, it is very obvious that even shareholders will continue using the system only when the marketplace can provide 'real value'. However, the real value CBVMs can provide is believed to be back-end integration through supply chain management in which especially Asian chemical companies are not yet aggressive to invest. Therefore, without offering such functions, CVBMs are not so much different from independent third-party exchanges after all.

Rather, there is a concern about neutrality issue and anti-trust regulation. These two may be the biggest concerns for most CBVMs, especially for mega ones.

Supposing there is an ideal type of CBVMs where back-end system is all integrated, so all the participants can share information about pricing strategies or future prices, or there emerges such schemes as joint purchasing agreements to drive down prices, the Federal Trade Commission is likely to file them for breaking rules of anti-trust. However, there is no such a CVBM yet in real business and still remains as a dreaming target, thus FTC is likely to approve most of the current CBVMs to develop their business.

Another concern is that CVBMs can be biased to their shareholders' interest even though they always claim their neutrality. However, seeing from one example that one of the Asian chemical CBVMs, ChemCross' 70% volume of transactions was from non-shareholder basis, most CBVMs are believed to be purely neutral party. .

To succeed, CBVMs will have to turn their founders' nominal commitment into something active and sustained. Such consortia must recognize the more fundamental asset provided by their member base-its unique knowledge of the industry-so that they can become arenas for sharing this knowledge and thereby make it possible to standardize products and processes, to spread risk, and to uncover new opportunities.

In addition, expediting standardization process in each industry and installing e-SCM through ERP is a must for CBVMs to go through in order to take fully advantage of their better positions to be able to differentiate themselves from others.

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B. Enterprise Integration Model (End-to-end e-SCM)

Another way of categorization of B2B business model with comparison to exchange model is 'Enterprise Integration Model'. Specifically in chemical industry, most major US consortium type of B2Bs are belonged to this group. Such B2Bs as Envera, Elemica, or Omnexus are still on the process of preparing for the platforms for the offline chemical players to be able to enjoy a real value-added service through integrating their back-end system.

The path of B2B evolution would be toward integration from e-marketplace and toward supply chain management from simple transaction. For this, development of industry standard in data exchange is a prerequisite. Through back-end integration, participating companies' workflow can be fully integrated, so that the whole transaction process from ordering to payment would be seamlessly integrated. It is only possible through connecting each individual companies' system from production, checking inventory, and up to

accounting. XML, which is a standardized web-based language, makes it possible.

In fact, CBVMs, until offline companies integrate their back-end system through ERP thus they can manage other companies' supply chain and their own in one common language, XML, cannot enjoy their superior position to independent exchanges. These are a few benefits CBVMs have which third party exchanges cannot easily have without industry back up. [7]

First, CBVMs both enable users to automate the payment process that can reduce rogue spending and to provide tools that minimize costly paperwork. CBVMs make it possible to submit and track documentation on-line, thus eliminating the repeated use of forms and enabling buyers, suppliers to gain access promptly.

Second, to make the purchasing and sales process more efficient, CBVMs can help implement uniform standards for transmitting data, for describing products, and for conducting business processes. At each step, fragmented global supply bases and thousands of SKUs can be managed in less wasty way.

Third, when uniform standards have been established, a CBVM can serve as a central hub that clarifies information and speeds up its transfer from many buyers to many suppliers. 'Real-value' which participating companies are dreaming, will be created as suppliers adjust production to demand more smoothly.

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[7] The McKinsey Quarterly, 2001 Number 2 On-line tactics by Dennis A. Devine, Christopher B. Dugan, Nikolaus D. Semaca, and Kevin J. Speicher

In a few industries, non-profit organization was already founded to develop transaction standards. Rosettanet of electronic industry and CIDX in chemical industry are one of those. They were designed with a belief that e-commerce should be actively used by industry to save costs and make trading transparent. Standardization of data exchange in business flow accordingly, should be carried out first

Table 2. Table of comparison of various business models (See Addendum)

2.2. Development of Chemical B2B E-business

Table 3 List of major chemical B2Bs around the world (See Addendum)

3. Chemical B2B in Asia

3.1. Characteristics of E-business Environment in Asian Chemical Industry

When it comes to Asian chemical industry, most of the people in the chemical industry would think of robust and fast growing markets. From time to time, there have been excess investments in capacity in Asia, which have caused a significant oversupply and lowered profitability across the world. Asian chemical industry nevertheless has become a very important part of the world chemical market.

In e-business, this might be the case again - this time only in a positive way. As Morgan Stanley puts [8], Asia-is the fastest growing internet market.

Table 4. Sizing B2B E-Commerce Market (US$ bn) (See Addendum)

Table 5. B2B E-Commerce Market Size (US$ bn) (See Addendum)

Table 6. Penetration Rates Assumed (See Addendum)

Asian B2B markets followed the world B2B trend which is up plunge and a little bit of restructuring. But it has more to succeed because the market hasn't been really explored yet. Not only have visionary Asian businesspeople recognized the great potential in Asian B2B industry but also they have started rapid construction of B2B in Asia. The Asian chemical industry, which has always been very adaptive to the changes, is not hesitant in committing substantial amount of financial investment and human resources to build B2B.

Asian chemical industry is keenly aware that, in order to keep abreast with the U.S. and

[8] Morgan Stanley Dean Witter 'Asian B2B Report', November 2000, 'A Value Explosion, But Who Gains?'

European majors with advanced technology, expertise, and fund to expand, it must press hard to embrace a more efficient way of business through electronic commerce.

Considering this urge and open attitude toward e-commerce, the B2B progress in Asia is comparable to that of U.S. and European majors and ventures in its eagerness and rate of adoption.

B2B e-commerce is expected to bring about profound transformation in all corners of "Business Process and Practices" in Asian industry. To illustrate, the main communication tool would go from face-to-face/phone/fax to the web and e-mail. Second, decision-making process would be made quicker and more lateral with delegation. Third, complex and inefficient supply chain will be restructured and managed under streamlined and automated control. Lastly, risk management for stable and less-cyclical profit structure will be widely employed.

A. Favorable B2B Environment in Asian Chemical Industry

As far as B2B is concerned, there are several important elements in Asian chemical industry that confers favorable environment for the B2B to flourish:

(1) Sheer size of chemical trading in Asia

The huge potential for Asia may arise from the sheer size of the chemical market. Approximately, one third of $1.7 trillion global chemical market belongs to Asian market. Asia produces 70% of global polyester intermediates in particular.

Asia is the fastest growing market in commodity chemicals both in production and

consumption. Asia is expected to grow twice as fast as rest of the world in the production of ethylene and several other commodity chemicals. The Asian share in the world market will be ever increasing.

(2) High proportion of spot business

The Asian market has higher proportion of spot business compared to U.S./European chemical market. In Asia, around 20% of base chemical and major intermediates trading is estimated to be purely spot-transaction based. Another 20% is in a way or another traded in spot manner (semi-spot) for international trade. This is mainly attributed to more opportunistic and speculative nature of Asian people. Europeans, Americans, and exceptionally Japanese traders put more significance on stable business while most Asian traders are eager to earn a high return even by taking a risk in the spot market.

The offline spot business can easily migrate to online trading thanks to the Internet's capacity to reach wider selection of vendors and customers. In addition, more transparent pricing available online will attract price-sensitive spot players.

On the other hand, in contract business in Asia, the players are prone to change their suppliers and buyers more often than their Western counterparts for reasons such as disputes over price, sudden change in credit status, and logistics cost. This behavior makes the contracts short-lived. In this regard, Asian B2B would be able to capture those contract businesses into online trading.

(3) Dynamic cross-border trading

Geo-economically, Asian market is much more fragmented than the U.S. and European market. Asian market is heavily dependent on import and export (cross-border business).

In contrast, U.S. market is more domestic-oriented. During the last decade, the chemicals export from U.S. has shrunk rapidly mostly due to self-sufficiency of Asian market. Canadian or Mexican border trade in U.S., which currently takes significant portion of cross-border trade in North America, is nevertheless of single aggregate market in business nature. In case of Europe, the emergence of EU has transformed the Europe market from multinational to a one-block economy.

Whereas Asian trading depends much on cross-border trading, B2B e-commerce can be an effective instrument to overcome several difficulties that entails cross-border trading, such as complex logistics, high marketing cost, different culture and legal systems, dispersed supply chain, and dissimilar domestic markets across the border.

Also, Asian chemical industry is deemed less integrated than European and US one. This means more trading liquidity is generated from merchant sellers and buyers in Asia while a great number of physical molecules are used in their captive use in one integrated chemical line in the US and Europe.

(4) Vertically Fragmented Market

The degree of vertical integration through the product stream in Asian chemical industry is much lower than that of the U.S. and Europe. In the U.S and Europe, there are far less inter-

company transactions, meaning more captive, than in Asia. Meanwhile, Asians buy or sell the chemical material more in merchant market.

This difference has become more apparent as many of the U.S. and European major commodity and polymer production units are being consolidated to larger sizes. Average capacity of top three polymer manufacturers in the U.S. and Europe is three times as large as that in Asia.

In the situation that there are numerous small- to medium-sized companies scattered across supply chain, the benefits brought about from the B2B e-commerce would be far more pronounced.

(5) Growth potential for paper trading

Asia harbors the high growth potential in paper nature business. Fragmented nature of Asian trading and the lack of awareness of risk management in chemicals trading have so far hampered the growth of paper nature business in Asia. As online trading becomes pervasive, the progress in standardization of transaction terms is expected to stimulate the increase in paper nature, which in turn would encourage the usage of paper trading as a tool for risk management.

(6) Dominant share of commodity products

Asian chemical industry has high proportion of low profit margin commodity chemicals in its product portfolio. Dependence on merchant feedstock (oil & naphtha) has further destabilized

the profitability. Compared with U.S. and Europe chemical industry that has high-margin specialty chemicals and high-yield technologies for commodity chemicals, Asian chemical industry urgently needs to cut down transaction cost and improve profitability by eliminating inefficient business processes. Asian chemical industry is seeking a breakthrough in cost-savings by adopting e-commerce.

B. Unfavorable B2B Environment in Asian Chemical Industry

However, no transparency in term of pricing, high cost in marketing for having new clients, and very old and conservative business practices would be the major bottleneck for Asian chemical B2Bs to progress.

3.2. Key Players in Asian Chemical B2B

Stimulated by the B2B hype since October 1999, many Asian chemical B2B have been announced by Internet-savvy third party entrepreneurs and large chemical companies who craved to become the first mover in the winner-takes-all competition in the Internet arena. Even after a sudden plunge of B2B hype in April 2001, and in spite of ensuing skepticism, various local B2Bs, mostly of catalogue aggregator type or information portal sites were launched in Asia.

Many of the active B2B players are from China, Korea, and India. The following are a list of a few examples of regional B2Bs, most of which are information portals or domestic transaction sites:

China:

ChemEase.com, ChemPages.com, ChemBusiness.net

Korea:

Chemizen.com, ChemTouch.com

India:

ExchangeNext.com, ProcessIndia.com, ChemB.com

U.S. trading exchanges like CheMatch and ChemConnect also made gradual entrance into Asia. These U.S.-based B2Bs beefed up their marketing activities in Asia and even made plans to establish joint venture for marketing with Asian chemical companies to supplement local and regional expertise.

So far, there have been only two global B2Bs initiated by industry consortia in Asia, i.e., ChemCross and ChemRound. The two companies have proceeded as announced to launch the exchange marketplace with various services and pan-Asia coverage. They enjoy the advantages of being supported by major chemical companies as shareholders in Asia from the initial stage.

4. Strategy for chemical B2Bs in Asia

What would be the quintessential elements of strategy for the B2Bs to bring the most value to the chemical industry?

(1) Building a Community

The success of B2B lies in forming a powerful community for collaboration in the industry. No B2B, whether a pure-play or a consortium, would be able to survive long without successfully building up the community among investors and the users. Considering the difficulty in rapidly building a sense of community among the users, however, industry-led consortia B2Bs might have more chances to form a stronger community than the pure-play and the horizontal suite-type B2Bs.

(2) Deep Offline Expertise

Deep offline expertise is another key to successful B2B. Until earlier year 2000, when B2B was regarded as an extended version of B2C or C2C, many analysts believed that the lack of IT or Internet experience in management group would be a serious bottleneck. However, B2B players have now refocused their attention from the financial or IT issues to managing intangible resources like offline expertise. Top management and the key managers who has extensive experience in the target industry are the indispensable corporate asset for the success of B2B.

(3) Regional Expertise

Each region varies in product structure, trade flow, and business practices, among others. Deep knowledge about the region is as critical as the industry knowledge. To be a successful

B2B, one must be able to accommodate the vernacular practices of target market.

Quite different from the U.S. and European market where the bad debt or delay in payment is not of significant concern, Asian businesspeople regard the completion of payment is one of the most critical issue in business. Managers in B2B would be better equipped to serve Asian market to have this kind of region-specific knowledge.

(4) Service Differentiation

The B2Bs who have built their services using off-the-shelf solutions or the hosted services may experience serious limitation for the future growth. Being tied to the license agreement, they may not have freedom to customize or upgrade the services for the differentiation against the competitors. Because these hosted B2B solutions are developed for generic B2Bs across several industries, it often fails to meet the needs of particular industry or region.

Being able to develop web application modules according to industry- or region-specific needs will be a key survival factor in Asian B2B against U.S.-based exogenous "one-size-fits-all" B2B services.

5. Case Study of Asian Chemical B2B: ChemCross.com

5.1. Corporate Overview

ChemCross.com is the first industry-owned consortium-type of chemical internet trading portal in Asia. Supported by a consortium of more than 60 major chemical companies in Asia and beyond, ChemCross.com is strategically positioned as the first significant player within the Asian chemical e-commerce space and the region's market leader.

Founded in February, 2000 when the concept of B2B e-marketplace was paid attention by many IT investors and the academia as well, ChemCross.com is focused on serving the needs of chemical and plastic manufacturers, buyers and intermediaries by enabling them to conduct real-time transactions for all types of products and services. By offering such services as business information, logistics and credit, ChemCross.com's vision is to become one of the largest and most complete internet supply chain networks in the industry.

ChemCross.com is headquartered in Houston, Texas and most of the main operations take place in Seoul, Korea. At present, ChemCross runs six different branches in the world besides its headquarter office in Houston, five of which are placed in Asia; Seoul, Shanghai, Tokyo, Singapore, and Mumbai.

ChemCross.com provides its users with three distinct service offerings: eMarketplace + vertical portal + IT network hub. Participants are instantly connected to global buyers and sellers and have access to a portfolio of strategic business-related services that specifically address chemical industry needs.

Since the opening of its online services on Oct. 30, 2000, over 2,000 members from more than 1,000 companies have joined as ChemCross business members. It has reached quarterly 100Kton of transaction volume in Q1 2001 and nearly USD100Million traded since inception in Nov 2000 with average of 30% growth per month. Over 150 companies have ever transacted in ChemCross marketplace and especially, strong buy-side network was established in Mainland China with over 600 Chinese buyers registered.

The major products traded on the site are mostly commodity petrochemical products such as benzene, toluene, xylenes; polymer materials like PVC, PP, PE, and ABS; and organic and specialty chemicals, including methanol, ethylene glycols, phenols, and isocyanates.

Most of ChemCross' management team have come to join ChemCross from major chemical companies in Asia. They have brought extensive business experience and proven track record in Asian chemical trading from their respective careers.

ChemCross has partnered with information service providers, information technology developers, and chemical B2Bs around the world.

5.1.1. History

It was after Mr. Soo-Chul Lee was promoted to the vice President of Chemical Division in Samsung Corporation in July 1999. He tried to conjuncture the scattered internal organization with harmony and focused on the long-term vision. With this passion and zest in this new organization, he switched his focus of interest from conventional way of business to a new wave. He was the person who actively challenged to the new idea and new trend, and most

importantly, his proposal for an advanced way of business toward e-marketplace was positively accepted in management level of Samsung Group. At that time, Samsung Group as a whole was investing in many projects of new economy with twofold supports, both in human resource and in capital.

New Task Force was formed in Samsung Corp's chemical division to develop Asian chemical business and to provide Asian chemical industry with new tools to step forward to more advanced way of business. Prestigious research institutes and investment banks issued a lot of analytic reports for this state-of-the-art business on a daily basis and chemical industry was always regarded as one of a few promising industries in e-commerce. This supportive environment and a positive result of feasibility study in Samsung Corp made possible this new Task Force to be established in Chemical Department among many other business departments in Samsung Corp. The original members of this Task Force were Mr. Chester, Mr. YK Yoon, and Mr. GY Chun. Mr.Chester Cha has always been a creative idea developer in the company since he firstly joined Samsung Corp after achieving master's degree in Seoul National University. He was a man of ambition and open-mind, hence whenever a new idea comes to his mind even when he was working in offline chemical trading, he always developed and actually tried this new idea even though a lot of trials and errors followed. When he was assigned as a leader in this Task Force, such personality and his performance until that time were reflected. Also, his interest and passion toward the new economy and IT business nourished during six years of stay in Houston, Texas as an overseas manager in Samsung Corp. helped him to dive into this new business without hesitation.

At first, they were proposed to invest in one of the biggest world chemical B2B, Chematch. Chematch, founded in 1997, was a chemical e-marketplace focusing on US market with

around 12 chemical companies participating in as investors at that time. In 1999 winter, Chematch management people were traveling to secure investors in Asia. In order to decide to invest in this project or not, Samusng Corporation itself had to study B2B and the profitability of this project. Chematch at that time suggested investing $1 million at the ratio 1%. This was obviously way too high valuation of Chematch, so the Samsung Corp's Task Force was seriously thinking about the profitability of this project. Reached to an idea that it would be better to initiate their-own Asian-focused chemical e-marketplace with their expertise in Asian chemical industry, they started to find partners and investors in chemical industry.

As it is very well noted, the most important thing when funding in IT industry, is to catch the right timing in a supportive environment since there is an ebb and tide in a newly highlighted industry. The members of Task Force thought it was time in December of 1999 to invite investors when IT rave attacked all the corners of society in Asia with about 6 to 8 months of time lag of US economy. So, they were fully engaged in the funding project. They studied, set a vision, planned a long-term business plan, thought about the services they can provide, and then made presentation materials. Starting from Korean manufacturers, they arranged meetings with major chemical companies in Asia and started the funding rally backed up by overseas network of Samsung Corporation. This project bloomed at the end of December when the world was celebrating new millennium. Finally, the Task Force decided to form an independent IT company, separate from Samsung Corp, and then named ChemCross.com.

Recalling that IT rave wasn’t continued since May of 2000, ChemCross.com is evaluated to be really lucky to have been able to catch the right timing. Finally, in January, ChemCross registered it as a Delaware Corporation in the US.

On the 15th of Jan. now the Technical director of ChemCross Mr. Clive Snook Chung joined ChemCross with 2 other web-experienced personnels. From then, ChemCross started to construct demo-website and develop the right way of building an efficient and multi-functional system for its business. Unlike other B2Bs, they decided to develop their own proprietary system not only to easily customize Asian-specific needs but also to save unnecessary costs to outsourcing B2B solution providers such as Ariba and Oracle. Partnering with Korean B2B solution company E-NET, Chemcross' internal development team started to build their own marketplace.

In February, 2000, it had a corporate Signing Ceremony with 27 Founder Companies and then in March, it established its headquarter in Houston and main operational center in Seoul, Korea. From then until July, ChemCross management people and strategy team members traveled all over the Asia to invite investors to this newly established venture company. Their target investors were mainly selected major offline chemical companies, rather than venture capitalists and investment banks because this project can significant only when many chemical companies participate in as investors and actually use this system afterwards. So, until then, ChemCross management visited many Asian chemical companies, made presentations and allured them into this project. Thinking that they should have regional basis at all across the Asia, they set up one-man offices in Tokyo and Shanghai in June and tried to invite extremely conservative Japanese chemical companies and Chinese chemical companies who hadn't been very familiar with the concept of B2B yet.

Reaching to an idea that the business environment is not favorous toward B2B any more, ChemCros finished its first round funding after its last funding seminar in July 2000. More than 300 Korean domestic venture capitalists and investment banks visited and then at the

end of August, ChemCross completed the first round of equity funding from 66 companies in mainly chemical industry and a few IT companies and venture capitalists.

From then, it concentrated on developing its system and marketing its e-platform facing its official system launch in October. Management and strategy team updated their new business plan, promoted to the media and pubic, made strategic alliances with various types of service providers and other chemical B2Bs in order to provide the best and the most helpful services to the industry. Also, they centralized overseas branches into main operation center in Seoul. Development team and IT team in the meantime, drew a broad picture of sitemap, organized the algorism and added new function. Marketing team visited chemical companies inside Korea and all over the Asian regions to invite people as business members before the opening and showed their demo-system and explained how to use this new tool. Before it launched its site on the 30th of October, ChemCross successfully performed pre-marketing, secured over 700 companies as business members. ChemCross announced its official launch of ChemCross online service, which is MDF Exchange on the 30th of October, 2000 and shipping e-marketplace after one month later. It started online business with its proprietary system MDF (Multi Dynamic Firm) Exchange for anonymous based exchange and later on, it launched Invitation Exchange for open private trading service in January 2001.

5.1.2. Shareholders

67 shareholders of Asian major chemical companies are the most important asset of ChemCross and these are the foundation of ChemCross creation. As an industry consortium based B2B, ChemCross was created with paid-in-capital of about $25 million from 67 shareholders.

The motive these 67 companies invested in this B2B is very various. Some companies were definitely motivated by capital gain which they can earn when ChemCross goes to public. When internet rave was hot and most venture capitalists and investors were eager to invest in B2B, such a big project was paid attention by most people in industry. However, it's worthwhile to note that ChemCross didn't induce many third-party venture capitalists and investment banks because this is industry-consortium type of B2B and the management noticed that this project can be only profitable with full support from the industry especially in initial stage to be settled.

So, as it shows in the addendum, most shareholders are Asian major chemical manufacturers and chemical trading companies except a few IT companies and chemical-specialized shipping company.

The second group of shareholders participated in this project with a long-term intention to develop e-business system of their own companies, so that they would be able to be accessed to online business. Under the pressure that chemical industry will be also reorganized with an internet environment such as online trading and supply chain management with integrated ERP system, companies were forced, by changing environment, to be exposed to online business faster than their competitor companies. As an initial trial, they decided to participate in ChemCross, hence they can step into their own long-term internet business. Especially the companies with such a motive are more eager to get various kinds of internet consulting from ChemCross and expect to experience real online trading besides their system development such as ERP and e-SCM.

The third group would be just followers with a concern that they shouldn't be behind when internet age comes.

ChemCross' shareholder base is the largest among Asian chemical B2B and the scope is comparable with major US and European chemical B2B such as Chemconnect and Chematch. Even though ChemConnect's paid-in-capital is five times bigger than ChemCross, ChemCross is worth to get spotlight in Asian chemical industry in that the average size of Asian chemical companies is much smaller than that of major US and European companies. Chematch, on the other hand, wasn't initially started from industry and their paid-in-capital is similar to ChemCross, but the number of shareholders are mush less than ChemCross and most importantly, major US and Euroepan chemical companies are excluded in its shareholders' list.

ChemCross, in its initial stage, asked a certain amount of volume commitment to its shareholders because it needed initial liquidity to induce enough number of members and trading principals. So, it got LOIs from most shareholding companies promising they will transfer 20~30 % of their trading volume to online business. Even though it wasn't a legally binding LOI, Asian shareholders, are ready to make their best efforts to provide liquidity in this marketplace.

Table 7. Shareholders List

Company	Country	Description
Lan Bao Xing Trading TPE. Ltd,	China	Lan Bao Xing Trading handles the export of chemical products, mechanic equipment and technologies, etc. The company undertakes businesses of joint ventures, cooperative ventures, processing customer's materials, They process according to buyer's samples, assembling parts supplied by clients, compensation trade,barter trade with neighbouring countries and economic cooperation connected therewith.
Nantong	China	In 2000, by national foreign economics & trade ministry, Nantong Company was awarded the import & export rights for dealing with

Company		the various products in chemicals, light industry, metals and etc. The main business of the company is operating organic chemicals, inorganic chemicals, plastic, rubber materials, tire, liquefied petroleum gas and so on.
Shanghai Jing Wen Industry Trading Development Co.,Ltd.	China	
Sinochem Pudong Trading Co., Ltd.	China	Sinochem Pudong Trading has transformed its traditional import & export trade to international trade ,from single commodity trade to multi-function operation, building itself into an enterprise featuring modern management, international operation and conglomerate organizations.
Winsway (Group) Enterprises Ltd.	China	Winsway has established network of offices and representations in all the strategic locations. Our offices are in daily contact with our customers; developing business, either facilitating supplies into china main or assisting our chinese suppliers to export into the inter-national markets.
Metro Pacific Corporation Pte. Ltd.	Indonesia	
PT. Eterindo Wahanatama Tbk	Indonesia	PT. Eterindo Wahanatama Tbk. is the leading producer of specialty chemicals in Southeast Asia and the sole manufacturer of Phthalic anhydride. The two modern facilities of the company are engaged in the manufacture of downstream products including plasticizers, synthetic latex resins, unsaturated polyester resins, alkyd and amino resins.
PT.GT Petrochem Industries Tbk. (formerly Andayani Megah Pt)	Indonesia	PT.GT Petrochem Industries Tbk. manufactures nylon cord, polyester chips, polyester filaments, plastic engineering, ethylene glycol, polyester staple fiber, petrochemical products and plastic engineering. Other activities of the group are the manufacture of nylon yarn and fishing nets.
PT.Polytama Propindo	Indonesia	
POLYPET KARYAPERSADA	Indonesia	Polypet Karyapersada is a world-class producer of polyethylene terephthalate (PET) resins with a production capacity of 84,000 tones per year. A foundation built on Total quality Management systems and state-of-the-art process technology has enabled us to meet the industry's highest standards including FDA and EEC requirements as well as achieving ISO 9002 certification.
PT. Polyprima Karyareksa	Indonesia	
PT. Wiharta Karya	Indonesia	

Agung		
Digital Investment LTd.	Indonesia	Digital Investment has interests in Pulp & Paper, Agri-Business, Properties and Financial Services. The group includes chemical businesses in the Pulp & Paper Division , Agribusiness Division and is a major user of chemicals in both industries.
AKC	Japan	Asahi Kasei Corporation manufactures and sells chemicals and plastics, housing and construction materials, Fiber and textiles, electronics, biotechnology and medical products, liquors, membranes and others.
Maruzen Petrochemical Co. Ltd. (Chemiway)	Japan	Maruzen Petrochemical Co. Ltd. has the corporate mission of contributing to the healthy growth of society and industry by drawing on the chemical technology. Maruzen is also proceeding with the development of new high-added-value products and expansion of chemical and chemical-related businesses in a wide range of areas.
Mitsubishi Gas Chemical Company, Inc.	Japan	Mitsubishi Gas Chemical Company produces methanol and hydrogen peroxide and it supplies xylene products, electronic materials, oxygen absorbers, biotechnology and optoelectronics.
Nikko Petrochemicals Co., Ltd.	Japan	Nikko Petrochemicals Co., Ltd. was established in 1991 through reorganization of Petrochemical Division of Nippon Mining Co., Ltd. (Currently known as Japan Energy Corporation) The company's main products are Aromatics (BTX, Solvent), normal paraffin, and propylene.
Nippon Steel Chemical Co., Ltd.	Japan	Nippon Steel deals in chemical products including base chemicals, synthetic resins, lubricants, composite and electronic materials. The company has thirty consolidated subsidiaries, nineteen in Japan, three in the United States, two each in the United Kingdom, Hong Kong and Malaysia and one each in China and France.
Zeon Corporation	Japan	Zeon, established in 1950, focuses on five businesses, including information (electronic and image) materials, specialty plastics, environment materials, RIM molding products and medical equipment. Zeon is committed to responsible stewardship of the global environment as the foundation for human prosperity through the development and application of unique, world-leading technologies.
Nissho Iwai	Japan	Nissho Iwai operates in several industries, including machinery, metals, commodities, construction, and energy. Through more than 600 affiliated companies in nearly 80 countries, the sogo shosha (general trading company) manages infrastructure projects and builds power plants, produces lumber and builds condominiums, imports consumer goods, and exports and distributes automobiles.
Taiyo Oil	Japan	Taiyo Oil has the refinery in Kikuma-cho Ochi-gun Ehime Prefecture, whose topping capacity is currently 102,000 barrels/day. The production capacity of benzene is 330,000 ton/year and 350,000 ton/year for mix-xylene. Taiyo Oil is currently supplying 60% of its benzene and mix-xylene to domestic users in Japan and 40% to

		foreign customers, like Korea. Taiwan, and China.
Tokuyama	Japan	Tokuyama has always sought to leverage existing strengths to branch out into uncharted territory. Refining expertise in these new areas, in turn, better positions the company to respond to the evolving needs of the marketplace. This passion for new challenges and an innovative zeal will continue to guide Tokuyama well into the next century
Japan Synthetic Rubber Co., Ltd.	Japan	JSR Corporation is now supplying many types of opto-electronic materials, in which JSR occupies a major share. Renewed JSR will continue to challenge for future in exploring its maximum potentiality, looking for some new advanced materials in the category of petrochemicals and opto- electronic materials.
Kyushu Oil Co., Ltd.,	Japan	Kyushu Oil, a supplier of the energy vital to everyday life, established three business pillars: an oil refining and distribution business ,a petrochemical business, and an industry leading independent power producer (IPP) business. Kyushu Oil will continue to promote diversity in its business in line with developments in related fields.
Chi Mei Corporation	Taiwan	Chi Mei Corporation was the first manufacturer of acrylic sheets in Taiwan. Chi Mei continues to foster the spirit of excellence and innovation, and it is a trusted partner for countless manufacturers and molders throughout the world. From Asia to Europe to America, Chi Mei is recognized as one of world leader in the production of plastic resins.
Grand Pacific Petrochemical	Taiwan	Grand Pacific Petrochemical is the first styrene monomer producer in Taiwan. Grand Pacific, receiving both ISO 9002 and ISO 14001 quality certification in 1997, maintains strict all-encompassing quality control systems and processes with professional technicians and modern equipment. "Everyone does exactly what he says. Your satisfaction is the only measure of my success."
Companies of Loyal Group	Taiwan	The business ranges of the group include Keeneyes Ind. Corp., Loyal Chemical Ind. Corp., Ningbo He-Qiao Chemical Ind. Co., Ltd., Jiang Yin Long Xin Chemical Co., Jiang Yin Xin-He-Qiao Chemical Co., Ltd., and the sales offices - Success Gate Ind. Ltd. (Hong Kong) , Sales Door Ltd. (China), He-Qiao Guang Zhou Office (China).
Magna(Grace)	Taiwan	Magna is a $1.5 billion leading global supplier of specialty chemical, construction and container products. Grace has a broad spectrum of customers, including the food, consumer products, petroleum refinery and construction industries. Grace's businesses focus on catalysts and silica products, construction products and container products
Tuntex Petrochemicals Inc.	Taiwan	was founded in November 1991. The company was established as the first manufacturer of Pure Terephthalic Acid (PTA), a major raw material of polyester which has been used in the textile, non-woven, automotive, bottling, and packaging industries
Cementhai Chemicals Co,Ltd	Thailand	Cementhai Chemicals has sales offices in China, Indonesia, Philippines, Myanmar and Vietnam. CCC's philosophy is to produce

(CCC)		high quality products without violating the environment or morality, and to provide customers the best services. As evidence, all of polyolefins plants have been granted the ISO 9002 and ISO 14000 certificates.
Aspen Technology, Inc.	US	supplies integrated software and solutions that enable process manufacturers to automate and optimize their plants and extended supply chains, while enabling e-business. AspenTech offers the industry's broadest family of scaleable solutions, allowing process manufacturers to achieve competitive advantage in the Internet economy.
Methanex	Canada	Methanex sources additional methanol through a marketing agreement with a plant located in Trinidad, and also through spot market purchases. Methanex' extensive global marketing and distribution system makes it the largest supplier of methanol to each of the major international markets and maintain our world leadership in methanol marketing, logistics and sales .
Samsung America, Inc. (SAI)	US	Samsung America, Inc. (SAI) is the American branch of Samsung Corporation. SAI's strength lies in its expertise in dealing with foreign markets, its knowledge of products, and cost advantages in purchasing and distribution. SAI is thus able to operate as both a trade intermediary and as a conduit for an immense volume of information.
Aekyung Petrochemical Co., Ltd.	Korea	Aekyung Petrochemical has manufactured and supplied at home and abroad, petrochemical and fine chemical products. The company's annual production capacity of phthalic anhydride, which stood at 8,400 tons when the company was founded in 1970, is now the largest in the world as a unit complex.
Daelim Corporation	Korea	Daelim Corporation is the exclusive trader of the petrochemical products manufactured by Daelim Industrial Co., Ltd Petrochemical Division. Daelim Corporation maintains a network of trading offices throughout Asia, especially in Korea and China. Besides trading petrochemical products, Daelim Corporation is investing in e-business and venture capitals.
Daewoo International Corporation	Korea	A locomotive for national economic development since its founding in 1967 as Daewoo Industrial Co., Ltd., today's "Daewoo International Corporation" is the new vanguard of Korean trade. We are involved in the domestic and overseas construction business, electronic home appliances, automobiles, clothes and semiconductors.
Dongbu Hannong Chemical	Korea	Dongbu Hannong Chemical is a leader in Korea's agrochemical field and a leading manufacturer of petrochemicals and ferro-alloy. The petrochemical division has built an effectively integrated production system that is capable of producing styrene monomer (SM), polystyrene (PS),expandable polystyrene (EPS),and other styrenic products.
E-net	Korea	E-net is an e-business solution provider that offers seamless e-business solutions in eTailing, eProcurement, eCRM, eCatalog, eMobile and eMarketpace that help reduce procurement/transaction

		cost and boost revenue to utmost. With 35% share of B2C e-commerce software market share in Korea, E-Net was recently mentioned by Forbes as one of the 300 best small companies.
Hansol Chemience Co.,Ltd.	Korea	Stemming from the existing paper manufacturing chemical products to environment chemical products, hydorgen peroxide, SB-latex, micro-capsules, Hansol Chemience has almost 20 years of fine chemical industry's know-how
Hanwha Chemical	Korea	Hanwha Chemical is one of the leading petrochemical companies in Korea and is principally engaged in the production of bulk chemical products for the Korean market. Hanwha Chemical was the first Korean company to produce chlor-alkali (CA), low density polyethylene (LDPE)/ linear LDPE (LLDPE) and polyvinyl chloride (PVC) products.
Hanwha Corporation	Korea	Hanwha Corporation is involved in the trading of petrochemicals, construction of apartments and non-residential buildings, and manufacturing of miscellaneous chemicals and communication equipment. The company has eleven consolidated subsidiaries, three in Korea and eight abroad.
Hanwha L&C Corp.	Korea	Hanwha L&C Corp. manufactures such daily necessities and industrial materials as decorative flooring, plastic window parts, interior and exterior decoration fixtures, automobile components, and a variety of films--all of that have served the citizens of Korea by improving our quality of life.
Honam Petrochemical Corporation	Korea	Honam Petrochemical Corporation is involved in the manufacture of petrochemical products such as synthetic resins, synthetic industrial materials including ethylene glycol and ethylene oxide for making polyester, automobile antifreeze solutions, methyl methacrylate, benzene, propylene and ethylene, in Korea.
Hosung Chemex Co.,Ltd.	Korea	Founded in 1978, Hosung Chemex Co. Ltd. has manufactured and supplied many kinds of performance solvents and organic peroxide. After merging with Jung Woo Co. Ltd. in January 1998, we have been engaged in the production and sales of thermoplastic polyurethane and polyester polyol, a raw material for urethane.
Hyosung Corporation	Korea	Hyosung Corporation is involved in the manufacture of nylon yarn and related chemical products. It diversified its business into computer banking systems and functions for the trading arm of the Hyosung Group.
Hyundai Oil	Korea	Hyundai Oil enthusiastically participates in oil explorations. In 1989, three companies including Hyundai formed a consortium with Spain's Repsol, succeeding in exploring oil in Egypt. It plans to grow into an unparalleled energy corporation by actively engaging in the purchasing of oil fields in the North Sea and a continental shelf in Indonesia.
ITPlus,Inc.	Korea	ITPlus,Inc. is providing web based eBusiness Infrastructure Solution such as EJB Components , Web Application Server , System Management Solution and etc. under the company slogan, " We

		Deliver the 'ITPlus Mind' to Give you the Perfect Reliability
Kohap Corporation	Korea	Kohap Corporation manufactures petrochemical raw-materials (PTA, PIA, DOP and etc.) synthetic fibers, resins, yarn, and polyester film. The company has nine consolidated subsidiaries. In addition, Kohap has entered leading-edge businesses such as telecommunications, new materials, and energy.
Korea Fine Chemical Co., Ltd.	Korea	Korea Fine Chemical Co., Ltd. is involved in the manufacture of toluene di-isocyanate which is used as a raw material for polyurethane. The company also produces various fine chemical compounds including pharmaceutical intermediates, special blocking reagents, chloroformates, and azodicarboxylates
Korea Petrochemical Ind. Co., Ltd.	Korea	Korea Petrochemical Ind. Co., Ltd., established in 1970, built the first polypropylene plant in1972. It is furnishing the productivity of polypropylene and high-density polyethylene and compound raw materials for industrial supplies to the houseware.
Kuk Dong Chemical Co., Ltd.	Korea	Kukdong Chemical Co., Ltd., established in 1973, is one of the leading producers of silica gel in Korea, endeavoring for customer satisfactions by constant research and development.
KOREA KUMHO PETROCHEMICAL CO.,LTD	Korea	Korea's largest manufacturer of polystyrene resin, Kumho Petrochemical has operated as Hannam Chemicals in 1972 and began producing GPPS, HIPS, EPS, ABS, SAN and PPG. Kumho Chemicals, Inc. was the only company that built the plant with its own technology and led the pack in domestic technology development.
Kunsul Chemical Ind.Co.,Ltd.	Korea	Kunsul Chemical, founded in 1948, have been labeled as the leader of high quality domestic and commercial paints in Korea. It is the company's goal to be the best producer of fine chemicals in near future.
LG Caltex Oil Corporation	Korea	LG Caltex Oil Corporation is the leader of providing total energy service. LG Caltex is focusing on three different categories of business, petrochemicals business (polypropylene, aromatics), energy business (oil refining business, LPG business, LNG, the business of producing electric power, transportation business), and lubricant business.
Namhae Chemical Corporation	Korea	produces more than 40 kinds of fertilizers including urea and compound fertilizers, fertilizers for gardening and fruit trees, and BB fertilizer, and 20 kinds of chemical products
Samsung Corporation	Korea	Samsung Corporation has dedicated itself to the realm of global business since 1938. The company leads Korea's overseas trading activities. Operating from 82 overseas offices, the Trading Group is involved in a wide variety of commerce, worldwide. The company's main export titles include semiconductors, machinery, plants, steel, chemicals, and textiles, energy, chemicals and machinery
Samsung General Chemicals (SGC)	Korea	Samsung General Chemicals (SGC) was established in 1988. The complex is comprised of plants for the production of C4, BTX, SM, EO/EG, HDPE, PP and LDPE, along with a variety of support and

		ancillary facilities. At present, the company's total output stands at about two million tons annually.
Samsung Petrochemical Co., Ltd.	Korea	Samsung Petrochemical Co., Ltd., the largest domestic maker of purified terephthalic acid (PTA), feedstock of polyester, has been offering the best quality product to elevate the quality of human life and also possesses the highest level of competitive edge in the world in terms of quality, productivity, and efficiency.
Samsung SDS	Korea	Samsung SDS is the largest global IT solutions provider in Korea with annual revenues of $1 billion U.S dollars and an expanding network of 6,000 employees in branches around the world. We offer a wide range of services and products such as consulting, systems integration, packaged software, outsourcing, and technical training.
SsangYong Corporation	Korea	ince 1954, SsangYong Corporation has been operating in domestic, export, import and offshore trade activities. The company deals with steel, chemical, cement, electronics, energy, textile items through worldwide networks, 27 overseas branches & 7 local subsidiaries
Tae Young Chemical Corp.	Korea	Tae Young Chemical Corp. started the tank terminal business in 1979. The company provides service for the imported goods for domestic sales as well as the exporting business with domestic products.
TongSuh Petrochemical Corp., Ltd.	Korea	TongSuh Petrochemical Corp., Ltd. was established in 1969, as an equally owned joint venture of Chungju Fertilizer Corporation of Korea and Skelly Oil Company of the U.S.A., and began its operations in the production and sale of acrylonitrile. The company continued to devote itself in the development and growth in acrylonitrile, sodium cyanide, and other petrochemicals
Toray Saehan Inc.	Korea	Toray Saehan Inc., the joint venture with 60% of Toray Industries Inc. (Japan) and 40 % of Saehan Industries Inc. (Korea), was established on Dec.1st 1999. Its 3 major industry fields are polyester base film and processing industry; polyester filament and textile industry; and polypropylene and polyester non-woven fabric.
UNID Co., Ltd.	Korea	UNID Co., Ltd. has been involved in diverse sectors of business from chemicals to timber for over 20 years. The company is a subsidiary of Oriental Chemical Industries. The Chemicals Division is manufacturing potassium carbonate, potassium hydroxide, sodium hypochlorite, liquified chlorine, ferrous chloride, ferric chloride, and hydrochloric acid (HCI).
Woolim Shipping Co.,Ltd.	Korea	Woolim Shipping, established in 1983, is one of the leading tanker companies in Korea. The company is specialized in shipping chemicals and oil products.

5.1.3. Management & People

ChemCross' management people have strong background in chemical industry. Being relatively young with full of expertise in Asian chemical industry and confidence about internet trading, they successfully completed funding for initial operation and achieved clear brand awareness as the first and the most promising chemical B2B in Asia.

In addition, those who are considered most recognized and influential figures in Asian chemical industry voluntarily accepted to take seats of board of directors and advisory boards.

Table 8. Profile of Management

Chester Cha, Chief executive Officer

Before joining ChemCross, Chester Cha has lead Global Petrochemical Trading Department at Samsung Corporation, a US$1 billion operation, for 3 years. His global experience includes six years of international petrochemical trading at Houston, Texas, USA, and total of 15 years in petrochemicals business. With keen sense for business opportunities and innovation, Mr. Cha have lead the management team in launching ChemCross from ground up. He masterminded strategy for global ChemCross business model. He holds an MBA from Seoul National University.

Advisory Board & Board Of Directors

- **Mr. Mineo Ono , CEO**

Mr. Mineo Ono joined Maruzen Petrochemical Co., Ltd in 1959. His professional experiences include Director of Chiba plant, Technology Manager and Managing Director of base chemical sales division. Mr. Ono was appointed CEO of Maruzen Petrochemical in June 1999. He received his BS in Engineering from Tohoku University. **Mr. Ono is Board of Director member of ChemCross.**

- **Mr. Won Bae Park, Chairman**

Mr. Won Bae Park joined Hanwha Group in 1988 and was appointed CEO of Hanwha Living & Creative Corporation in 1996. He is currently the Vice Chairman of Hanwha Group and Head of Hanwha Eagles, a professional baseball team in Korea. Mr. Park is a graduate of Seoul National University. **Mr. Park is Board of Director member of ChemCross.**

- **Mr. Kunishi Kawai, CEO**

Mr. Kunishi Kawai joined Taiyo Oil Corporation in 1967. After extensive experience at Taiyo Oil Corporation, he was appointed CEO in November 1999. Mr. Kawai received BA in Chemistry from Chuo University.

- **Mr. Hyun Myung Kwan, CEO - BOD**

Mr. Hyun worked at Korea's Department of Auditing prior to joining the Samsung Group.
His professional experience includes serving as CEO at Samsung Watch Co., Samsung Engineering & Construction, and Chief of Staff to the Chairman. He was appointed CEO of Samsung Corporation in 1996. Mr. Hyun received his BA in Law from Seoul National University and MA in Economics from Keio University. **Mr. Hyun is Board of Director member of ChemCross.**

- **Dr. Shang Jung Yuh, CEO**

Mr. Shang Jung Yuh is CEO and Chairman of Grand Pacific Optoelectronics Corporation, and Director of Golden Pacific Equities, Ltd. He received MS in Chemical Engineering from University of Rhode Island and PhD in Chemistry from University of Notre Dame.

- **Mr. Winston, Wen-Young Wong, Chairman** Mr. Winston Wong is Chairman of Grace T.H.W Group and Vice Chairman of Trust-Mart Corp.
Prior to joining Grace T.H.W., Mr. Wong was President of Nanya Technology and Dean & Professor at Chan Gung College of Medicine and Technolog. He received BS in Physics and PhD in chemical engineering at Imperial College of Science & Technology from University of London.

Management Team

- **Chief Operating Officer**

ChemCross COO is an expert in industrial and fine chemicals trading who have built reputation for his down-to-earth operational skills at Samsung Japan. During his 15-year career in Samsung, he managed distribution and export/import of chemical products in Asia. Currently, he oversees operations of Far East Asia offices. He holds BS in Chemical Engineering from Korea University.

- **Executive VP & Chief Strategy Officer**

Widely experienced in global marketing and trading of plastics, especially specialty plastics and polyester resins, ChemCross CSO has charted the business development plan for ChemCross. He also worked at Samsung America for distribution of PET film in USA. He holds an MBA from the University of Texas at Austin.

- **Chief Technology Officer**

For five years before joining ChemCross, ChemCross CTO was involved with implementation of SAP R/3 for overseas subsidiaries of Samsung Electronics Co,. Ltd. as a project manager. He also directed various e-commerce projects including B2C shopping mall and order management system based on BroadVision engine.

Starting from Factory Automation team at MIS department of Samsung Electronics Co., He has undertaken several warehouse automation projects and ERP system implementation projects for overseas subsidiaries of Samsung Electronics Co., Ltd. His other technical expertise spans information systems with IBM AS400 and HP-9000 UNIX platforms, RPG language, and interfacing SAP R/3 and BroadVision system using IBM MQ Series middleware

5.2. Business Model and Its Execution

5.2.1. Development of ChemCross Business Model

Before we go on to the development and evolution of ChemCross business model, let me briefly look into the most widespread pattern of many chemical B2B.

Most independent chemical B2Bs founded by venture capitalists or entrepreneurs were started as catalog type of B2Bs. With relatively small amount of paid-in-capital and shallow expertise in this industry, one of the easiest business models they could approach to was catalog type. Therefore, they, after launching sites, were in a hurry to collect enough number of vendors who could be readily putting their products on these online catalogues. However, the actual users cannot actively participate in without going through a sample test or having a trust toward the vendors' credibility.

With this catalog type of B2B, the most generally and easily taken business model was "portal". This, mostly functioned both as an information service provider and community forum, could easily appeal to the people in the industry. Also, it was the business model where the entry barrier was the lowest. So, many local and regional chemical portals were set up and they broadcast a lot of chemical-related industry news and analytical market reports. In spite of affluent market information, usually free information service especially at the

initial stage made these small-scaled portals difficult to operate. In many cases, these portals closed their operation facing the bottleneck of spending much more expenses without enough amount of revenues.

After catalogue type of B2Bs, auction type was welcomed the most as the second group in the chemical B2B industry for the time being. In most cases, unlike those auctions in C2C such as e-bay or Yahoo auction where it is relatively easier to collect multiple hosts and guests, auctions in B2B took too much time and marketing expenses to hold a single tender.

Supplementing the disadvantages of catalogues and auctions and saving unavoidable expenses to operate business, the concept of e-marketplace has emerged. As the previous part of this paper described in detail there are two types of e-marketplaces, which are independent marketplace and consortium type of e-marketplace. Chemcross, as a consortium type of B2B, pursued three business models at first. Those were first, setting a neutral e-marketplace by more than 65 major Asian chemical companies, second, providing portal service, and the third, functioning as an IT network hub.

One-stop eMarketplace

As a one-stop e-Marketplace and full-service trading platform, ChemCross.com offers a package of multi-functional tools, such as trading and transaction, logistics, payment, credit, and insurance, enabling customers to streamline business processes for efficiency and reduced costs. To make users be able to most efficiently take advantage of this online tool, ChemCross support users with timely information in-depth analysis on current trends in Asian chemical market and help buyers and sellers of chemical products make reasonable decisions for their business transactions.

Vertical Portal

As a vertical portal for the chemical industry, ChemCross.com delivers business information. In addition, the site offers industry analysis generated from its off-line networks as well as from leading global chemical information suppliers. The services also include many useful business tools such as a “who’s who” directory service, real-time communicating tools, multi-media services, community-related services and more, all embracing the most up-to-date Internet technology.

IT Network Hub

As an IT network hub, ChemCross.com provides its users with access to IT expertise and resources in supply chain integration, e-commerce solutions, intranet, ASP services, and other related applications. ChemCross.com will license its own e-business solution including MDF (Multi Dynamic Firm negotiation) and small scale IT systems customized to Asian chemical companies.

Right after launching its site, Chemcross, firstly focused on operating a neutral e-marketplace and on providing information service. In so-called 'trading center', about 10 business facilitators with at least 7~10 years of experience in the chemical industry, induced offline chemical players to online trading house by providing offline supporting by calling, faxing, and sending e-mails.

At the same time, ChemCross portal team uploaded daily market information. However, consisted of non-chemical experts, this portal site was criticized by many offline players for

not being precise and quick.

ChemCross, after 2 months of its operation, finally realized that operating e-marketplace and providing information service should be originated from one team. In addition, realization of ChemCross' management people that it would be extremely difficult or almost impossible to achieve the expected revenue just with online trading, led ChemCross to be equipped with rich offline support system. In this immature B2B environment in Asian chemical industry, it was a daydream to expect to induce voluntary liquidity to this e-marketplace without any offline supporting service. To get another round of funding in near future and to prove ChemCross is one of few chemical B2Bs which make profit, it was inevitable to create revenues through offline support. Since ChemCross changed its organization into online-offline hybrid type in January 2001, it achieved $250million dollars' worth of business transaction within 10 months.

In this process, ChemCross, without hesitation, decided to focus on these two functions-e-marketplace and information service- and develop IT business later on when its online marketplace can invite enough volume of liquidity with less offline supporting service.

This decision was followed both by observing a few beginners' failure cases and by judging it's not a right timing yet to spend time and energy into IT business in Asian chemical business when most chemical companies are not ready to invest into IT infrastructure and back-end integration system.

5.2.2. Development of the Online Services

Available since October 2000, ChemCross has provided online chemical exchange services

to over 1,000 member companies in Asian chemical industry. Transactional value of over $120M has already been made on the site and is growing at average of 33% per month.

ChemCross has undertaken three major B2B e-business projects for chemical industry. The company has developed and patented unique trading mechanism by collaboration of chemical traders and system developers. Online chemical trading is mostly through its anonymous based online transaction 'MDF Exchange'. Also, for more private exchange with a limited number of customers, ChemCross launched its second online transaction model, 'Invitation Exchange'. In addition, partnership with strong technology service providers such as Aspen Technology, E-Net, and IT Plus adds to ChemCross' capability to provide e-business systems development and back-end integration services.

In order to make users take advantage of this system more efficiently, ChemCross provides offline consulting service to users. Business consultants of each chemical product feed users with real-time market information and many times they lead users to make the best decisions.

ChemCross Trading Exchange service is currently focusing on commodity chemicals (petrochemicals, polymers, organic and inorganic chemicals).

5.2.3. Characteristics of ChemCross Online Exchange

Unlike many other chemical B2Bs, ChemCross developed its own proprietary online tool for its marketplace. Basic design and system development were progressed by ChemCross' internal human resources. Those who have more than 10 years' of experience in actual day-to-day chemical trading, studied, surveyed and designed online trading tool which they think

most efficient and valuable to the serious business people in this industry. By outsourcing system buildup portion to E-Net, which is an e-business solution provider in Korea, ChemCross could save expenses which usually most B2B companies should pay to solution providers. In addition, quick and relatively easy system upgrading and maintenance was only possible because this online tool was made on its own.

MDF Exchange

Called MDF (Multi-Dynamic-Firm) Negotiation, the MDF Exchange is believed to overcome several shortcomings in ordinary auction-oriented e-marketplaces. The MDF Exchange allows the members to present their offers in multiple variations of conditions to multiple trading partners at the same time, which is not feasible in the off-line business for fear of double contract. The deals are dynamically assigned to the partner with the most favorable condition. Once a deal is made, other negotiations are automatically cancelled.

Anonymous Negotiation & Screening Functions MDF Exchange has a merit in that the users can participate in the negotiation without revealing one's identity until the deal is finalized. To complement this function, users can choose which companies to screen out from the negotiation prior to the dealing process.

Grouping & Auto Cancellation Functions Users can group several different postings with similar intentions, which enable the users to handle multiple negotiations with ease. On the other hand, if a trading partner accepts a posting within the posting group, all other postings in the posting group are inactivated and cancelled in order not to cause a double contract.

Private Trading Room

Whileas MDF Exchange could provide maximized values to day-to-day to petrochemical trading companies, this NYMEX or CME (Chicago Mercantile Exchange) type of cyber trading wasn't really welcomed by many other chemical players such as in plastics & polymers or organic and specialty chemical sector. The nature of the business between Petrochemical trading and other chemical sectors is very much different. Because most of the petrochemical products are commodity chemicals, trading in this sector is usually done just like futures or options of crude oil or stock trading even though the liquidity is smaller. However, this kind of random and anonymous based trading is not possible in other chemical products such as organic and specialty chemicals because the specifications and sample testing of each individual company's product is the most important factor. So, "many-to-many" type of trading tool like MDF Exchange couldn't be really accepted. Therefore, ChemCross, designed another mechanism that can be applied to those other products, in a word, "one-to-many" type of trading tool.

Invitation Exchange has been developed in order to minimize the potential conflict between the off-line sales channel and the online offerings and also to prevent the loss of brand value that when employing open, anonymous exchange marketplace.
With Invitation Exchange the users can realize the most suitable transaction through simultaneous competition of invited guests, minimize the conflict with the off-line channel and loss of brand value (price disturbance), raise confidence through the selective customer invitation, make use of differential strategy by market segmentation and reduce costs of developing potential customers.

Information Service

The value and uniqueness of ChemCross online exchange resides in the rich information

generated by its market advisors connected through international network. Daily market information on the petrochemical products based on the postings and actual transactions on the ChemCross marketplace gives a strong reliability to the users and this market information is being distributed to 700 Asian chemical players through e-mail as well.

5.3. Strategy for Growth

5.3.1. Changes and Challenges in B2B Environment

To cover general B2B industry across the fields, B2B hype has disappeared and severe filtering process has started in the market. Especially quite a few B2Bs by third-party venture capitalists or independent entrepreneurs already closed their operation. The current B2B environment is only for those a limited number of B2Bs with core-competences and deep offline expertise in each industry.

To transfer enough liquidity from conventional offline trading to online trading, it's essential for e-marketplaces to provide additional values to the users. Unlike e-marketplace in consumer sector where the concept of time-saving and multiple selection is a key value for users, B2B e-marketplace should provide value-added service other than time-saving, which offline traders couldn't possibly offer because of limited resources. However, it is very difficult for most current B2B marketplaces to provide additional value-added services such as services covering all sub-functions of transactions such as inspection, shipping, and payment services. It is not only because it needs a great amount of capital to install those functional services but also because the environment is not yet mature for those B2Bs which

pursue to provide back-end integration services through e-SCM. Due to dampening B2B environment and inactive participation of offline people, B2B marketplaces should continuously fine-tune their business models with a variety source of value-added services such as consulting, training, and technology licensing as well as transactions.

Specifically in chemical sector, the environment is getting harsher for small regional e-marketplaces and most marketplaces which provide simple transaction platform. Currently surviving chemical B2Bs are mostly consortium-type of B2Bs with mega funding from major chemical companies such as Chemconnect and Chematch in US and Europe and ChemCross in Asia. Another group of survivors are huge projects which most major US and European chemical companies are participating in with a shared mission to integrate their back-end systems through ERP and e-SCM, so that they can save transaction costs, monitor the situation of the overall industry, and furthermore, the chemical industry itself can be upgraded.

5.3.2. Strategic Partnership

ChemCross currently has strategic alliances with about 10 partners from different fields. Surrounded with the harsh environment for unproven tool, additional funding is very difficult to host for most B2Bs. It is a dilemma, therefore, to provide value-added service to users of high expectation within the tight budget. Facing this dilemma, ChemCross, tries to solve this obstacle by making strategic alliances with proper partners. In this way, ChemCross expects to be able to save costs and to focus on its own core competency. These partners can also get

promotion effects as well by being partners with ChemCross, which has about 67 major chemical companies as shareholders and over 1,000 chemical companies as business members all over the world. So, it was relatively easy to go through making strategic partnerships.

The main synergy effect ChemCross expects to earn from each partner is various.

First, to provide real-time and trust-worthy market information, ChemCross has made partnerships with several information portals and chemical information journals. Upon the idea that the biggest market in Asia is China, but it's very difficult to catch precise and quick Chinese market information because of non-accessibility and language barrier, ChemCross started to find the most promising Chinese chemical information portals in China, Taiwan, and Hongkong respectively. And then, finally, Chemease.com and ChemChina.com were selected as partner companies for ChemCross. These two companies also, were happier than ever in that the reliability of their websites can be strengthened by making a partnership with ChemCross. Chemease is a China-specific chemistry B2B portal site with 5,105 registered users, 7,400 transaction postings, and reporters in 30 different cities. Chemease, for its own funding rally, suggested and went through a symbolic amount of share exchange with ChemCross. ChemChina.com is an online trading company under the control of the biggest Chinese chemical tycoon, Sinochem. ChemChina, also readily agreed to make a partnership with ChemCross for providing Chinese market information on ChemCross front page.

In addition, for market alerts and daily information, the world's biggest energy and petrochemical market information provider, Platt's provides information on ChemCross' portal as an information provider. In addition, besides daily market information, to provide more analytic market report to users, ChemCross and Chem Systems, which is a leading

business and technology consulting company to the global chemical and petroleum industries made a strategic alliance.

Second, ChemCross was open-minded to cooperate with other major chemical B2Bs such as Chematch and Omnexus. By partnering with CheMatch.com, which is one of the largest chemical e-marketplace, ChemCross thought it can provide an access to its Asian users into US and European market. In terms of size, business scope, and the services both companies provide, ChemCross and Chematch both agreed to be their regional assistance for each other. ChemCross and CheMatch have entered into a mutual agreement, which will allow ChemCross access to CheMatch's Global Trading Network and information resources. Besides, in plastics industry, with an alliance with Omnexus, formed by BASF AG, Bayer AG, Dow Chemical, DuPont and Ticona/Celanese focusing on the plastics industry, both companies believe this alliance has powerful synergistic possibilities for both sites' customers and suppliers.

Third, ChemCross, with the initial vision to be an one-stop e-marketplace which provides all the functional services, hosted Intertek Testing Services Caleb Brett, which is the biggest inspection company for crude oil, petroleum products and chemicals. Also, for the logistics' e-SCM service, it formed an alliance with Optimum logistics. However, the functional services, which ChemCross initially considered possible to provide, are off the attention in initial stage.

Lastly, at the initial stage when ChemCross put its business priority on IT network service, Aspen Technology approached to ChemCross as a feasible partner for ChemCross' IT service co working. Aspen Technology, which specializes in optimizing chemical plant and production process, is able to market its own software to huge number of ChemCross

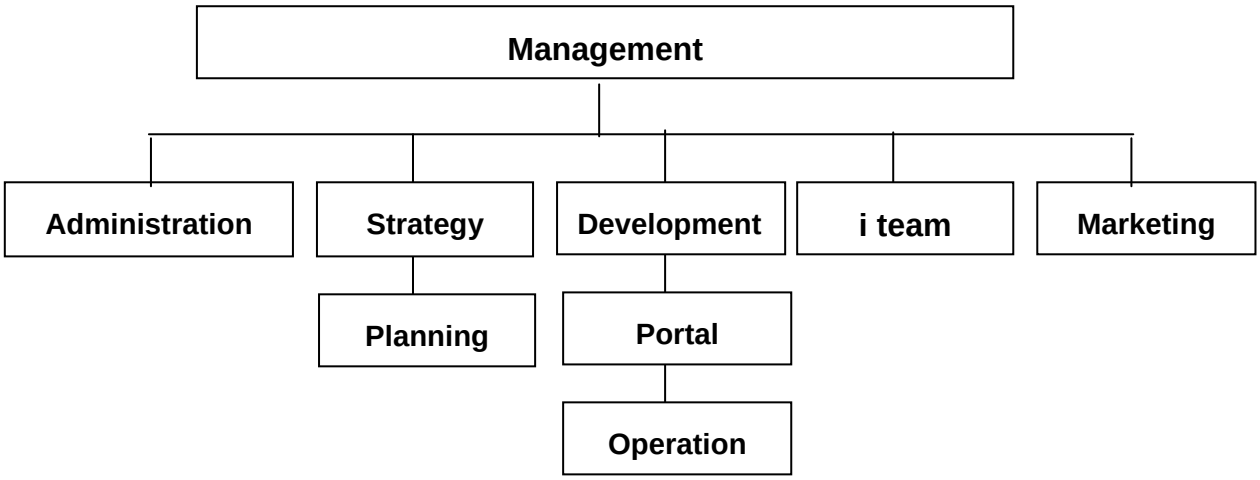
business members. In addition to this synergy, Aspen Technology and ChemCross are pursuing to automate and integrate key business processes with the trading site, and with each other using AspenTech's collaborative supply chain solutions. In addition, AspenTech will serve as a Technology Advisor to ChemCross.com. AspenTech will substantially contribute to ChemCross.com; providing solution services to its participating companies.

5.3.3. Evolutionary Changes in Strategic Focus

As B2B environment has been continuously changed, ChemCross' strategic focus on running its business has also been adapted to dynamically changing environment. ChemCross management people's pledge to their employees was this organization would change every three-month in a most optimized way. This was from a decision that dynamic organization might be essential to survive in a relatively radically changing environment especially in such a new industry like B2B.

ChemCross, with the eventual goal to be the world’s most influential chemical B2B marketplace, placed its headquarter in Houston, Texas, which is geographically a central hub in world's chemical industry although it focuses on Asian trading at present. Since it launched its system in October 2000, ChemCross is focusing on Asian chemical business and decided not to expand its business to other areas than Asia for the time being.

A. Initial Stage after Task Force (Feb. 2000 ~ Aug. 2000)



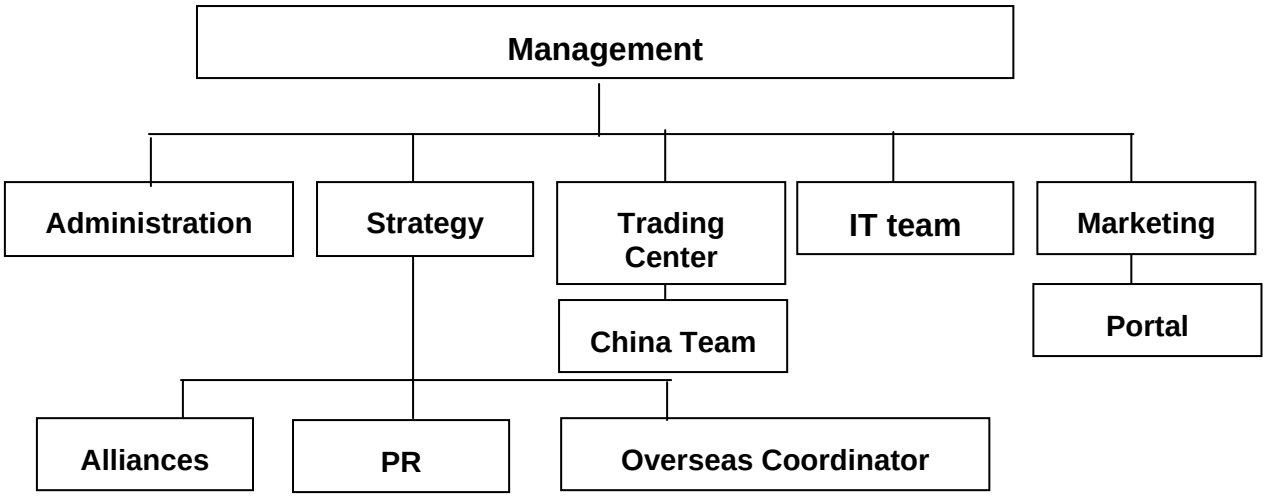
After its signing ceremony in February, 2000 with 27 founding shareholders, ChemCross' task force was separated from Samsung Corp and set up its office, initial organization focused on system development, promotion and devising strategies.

Initial stage of ChemCross was, in a word, studying and researching organization. With small number of employees in the new industry, which nobody previously experienced, always had to be up to date of the new current. Therefore, besides people in the administration department dealing with accounting, general administrative, and human resources work, all the other departments focused on system development, information portal website designing, benchmarking other internet companies' successful cases. All of theses tasks were the basis of setting up a ChemCross' new business model. Because there wasn't any standard organizational model and most of the companies were still being tested, they had to continuously study and go through trials and errors in their business model.

In addition, at the early stage of its setup, taking care of shareholders was one of the most important jobs as well. Shareholders are the root and trunk of ChemCross' business. The

capital came from the shareholders and these would be the actual users of ChemCross' system. So, gathering shareholders, stock handling, organizing legal rights of shareholders, and hosting events for these shareholders such as distributing newsletter was a key task. ChemCross' planning team took care of all of these works. In the mean time, strategy department tuned its business model, made strategic alliances with many other companies and continuously sought for a winning business model. Very importantly, overseas branches were set up in 5 different cities, Houston, Seoul, Tokyo, Shanghai, Mumbai.

B. Right After system launch (Sep. 2000~ Dec. 2000)



After finishing system development at the end of September, ChemCross started to market its service and prepare for commencement of its online business. Under the name of "October Sky" project, it began its rally to induce chemical companies as their members and hired business facilitators to support offline chemical players into online business.

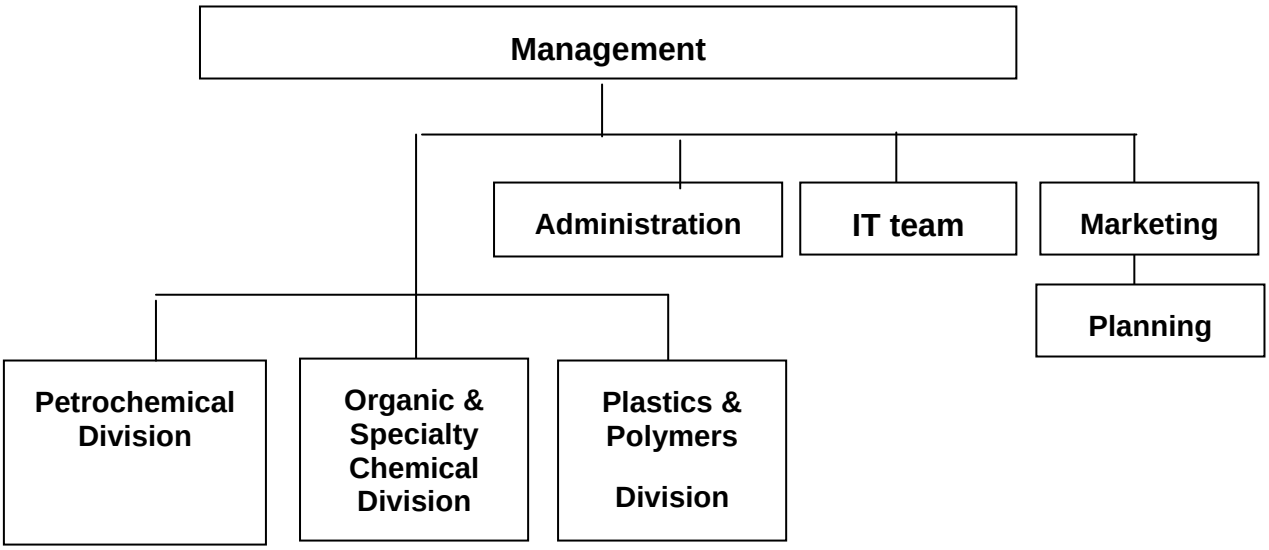
Strategy department's main task covered making strategic alliances, press release, promotion,

and controlling and converging scattered overseas braches' work into Seoul main operation center.

Besides, ChemCross designed new business department inside the organization called 'Trading center'. The 'trading center', with equipped with the state-of-the-art media and telecommunication systems, was designed to support and facilitate online business. Business facilitators in trading center were composed of 12 middle managers with at least 10 years of experiences from diverse fields of chemical industry. Main roles of business facilitators were literally to facilitate online business. So, when there is any firm selling and buying inquiry, specialist of each product call potential counterparts, provide them with real-time market information, and help them to make business decisions just in case they are not accessible to online or too busy keep watching internet website. Or if there is anybody who is not familiar with online tool, they were supposed to explain how to use the system most efficiently.

In the mean time, everybody who has a language ability in ChemCross, regardless of the department s/he belongs to, worked as regional coordinators to help offline people to register to ChemCross, make them familiar to online system, so that they wouldn't have much trouble to use system later on when they have any business chance. Registering real business people and controlling credibility of each user was extremely important. So, regional coordinators called or actually visited major and potential users, make them register, sometimes screen people, and make them familiar to this new tool as one of the most important pre-marketing tasks. As a result, before its site launching, they could induce more than 700 major chemical manufacturers and chemical traders as business members.

C. Provide offline support (Jan. 2001~May 2001)



Just like many other chemical B2Bs, expecting offline industry's voluntary participation was extremely difficult when B2B was off many people's attention. People in the chemical industry didn't feel necessary to visit online services because it was easier to find counterparts offline within their own network. Those chemical companies have already been in this industry for more than a dozen of years and especially those big major companies like global chemical giants or Asian trading houses, could continue their business without any difficulty. They were very much accustomed to their conventional style of business, didn't have any interest in changing their business pattern.

Also, at the end of 2000 within two months after its system launching, ChemCross performance was far below their expectation and people by then, started to say it was an expected result in this harsh environment. Some people criticized ChemCross for not providing any value-added service. After two months of servicing, ChemCross management made a critical decision to improve business services and to make offline people to online voluntarily. By then, they realized it was wrong to wait people to voluntarily come to online

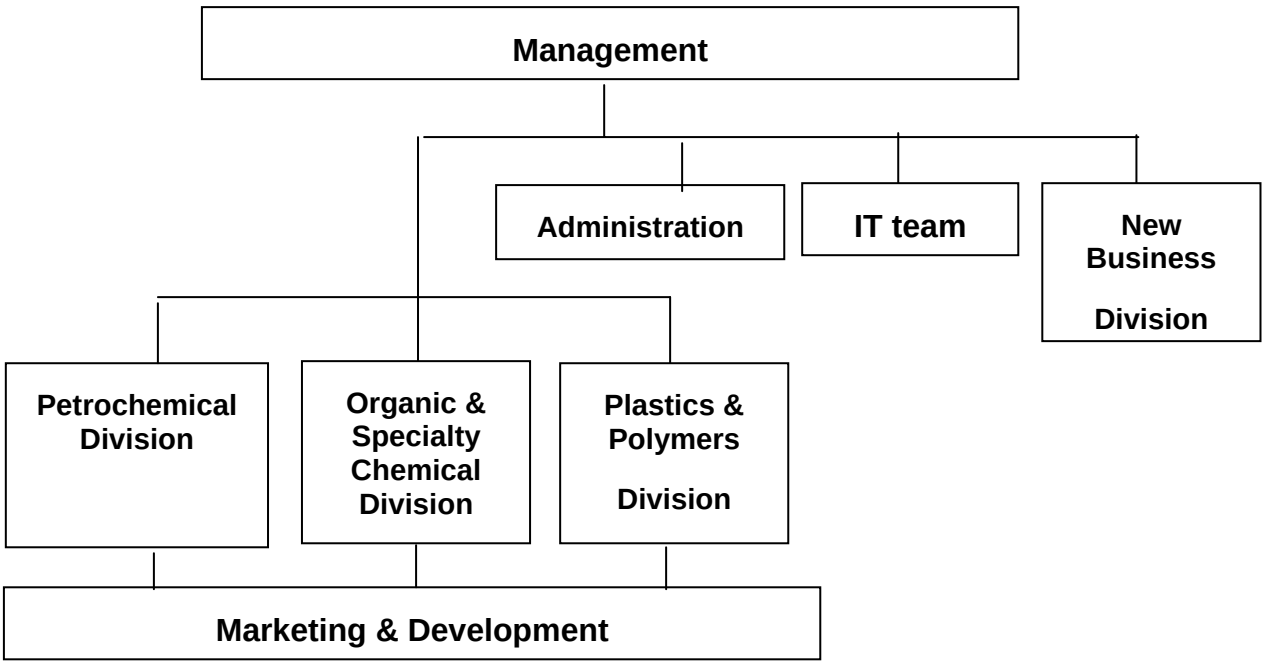
website. Also, it was wrong to search and provide information in two different departments, which were 'trading center' and 'portal team'. They realized too many people in the organization were involved marketing department as well to for additional business members as well.

Having found these three fatal things, management decided to rearrange the by three different divisions: Petrochemical division, Organic & Specialty Chemical division, and Plastics & Polymers division. Each division is headed by industry experts in each field with offline experience more than 15 years, middle managers with 5~7 years of experience and juniors who have usually just graduated from college. Being both an information porter and a business facilitator, juniors were taught chemical industry and offline trading by middle managers truly day and night. To gather market information, they had to talk to numerous offline business people with many years of experience, in this process, industry people were generally very doubtful whether or not they could grow up as a real business facilitators. Because it is very difficult to cover all different items, even middle managers in each division had a very hard time getting critical information and developing each player's intention into a real business. Much more, junior business facilitator, without any experience in this field and with scarce knowledge, were frequently criticized. However, they grew up incredibly fast after studying this industry and simulating many case studies until midnight everyday even during holidays and weekends. All of thee business facilitators were soon welcomed by most of the people in the industry and offline business experts were amazed to see these junior's fast growing. Many people started to call ChemCross first to ask what's happening in the market and if there isn't any business chance to take. Each division stepped further to make information service just like a daily journal based on what business facilitators collected in the market. The amount of the information was amazingly huge and information from

overseas branches was just enough to inform offline people. Headquarter Houston office started to provide US market information on energy and basic petrochemical news, and this service area was expanded to all Asian branches too. Within 3 months after rearranging the organization, ChemCross became a symbol of commodity exchange for Asian petrochemical trading with web-based liquidity generation. Also, it functioned as a gateway for non-Asian chemical companies.

The total transaction volume has increased up to more than $70 million within three months. Finally, ChemCross has achieved $100 million as its total value of completed transactions on its marketplace in early May and this number was remarked earlier 2 or 3 times than other western B2Bs like chematch and Chemconnect.

D. From a simple e-marketplace to online consulting service (June 2001~Present)



Since organization was rearranged by each division system, transaction volume has been

increasing and the influence of ChemCross in the industry got much larger. Many companies are paying attention to ChemCross' next movement in a way another and wonder what it has on a daily basis. In addition, since ChemCross has made its own information service and distribute to almost 1,000 people in the industry, a lot of companies try to take advantage of ChemCross as their window for public announcement.

As of early October of 2001, the total transaction volume has increased up to more than $300 million after its commencing service at the end of Oct. 2000 and active offline supporting activity from January, 2001. ChemCross was also introduced by CNN e-Biz section, as one of few promising Asian B2Bs.

However, ChemCross management has faced obstacles again from second quarter of 2001 despite this remarkable performance. Chemical trading business is pretty much sensitive to seasonal changes and market situation. More specifically, all of the petrochemical products and plastics products are influenced by oil market and also definitely relates to consumer's economy. Therefore, performance and liquidity of marketplace in ChemCross is also very much fluctuated by the upstream crude market. In brief, they inevitably faced an enormous wall which is very difficult to break through by simple deal matchmakings. Encountering this obstacle, ChemCross had to find another breakthrough to increase revenue. Accordingly, they decided to start active information service based both on the real-time daily information and analytic information and provide business consulting service.

Equipped with analytic view to the market and insightful logic, about 25 business facilitators, renamed as business consultants, provide hesitant offline people with critical information to assist their quick decision-making.

Other than simple transactions, they also design schemes to provide win-win synergy to both

sellers and buyers. Usually trading is zero-sum game, so when a seller earns, a buyer should lose and vice versa. However, by designing value-added business scheme such as time swap, location swap or tolling business, ChemCross business consultants could provide win-win business to both parties and charged premium commission fee for such a service.

To become an information provider, these business consultants collect daily information, think about each trader's position, research each manufacture's situation, analyze broad market situation, and finally forecast the future market. This service will be provided on a weekly, monthly, quarterly, and yearly basis respectively. Analyzing supply and demand situation of each trading product and suggesting a forecast based on the logical analysis is the key of information service.

Now, it is time that ChemCross initiates this upgraded service and many eyes and ears are there to observe how it develops as time passes.

5.3.4. Development of Global Customer Support Services

ChemCross' vision is to be a liquidity generator and velocity increaser in the chemical industry, thus to become an e-community collaborator. For this vision, ChemCross' customer supporting service is steadily developed.

Some customers actively exchange information with business consultants even though they don't make actual business transactions and some customers, on the other hand, are more focusing on making transactions instead of information exchange. Business chances are just followed after such an active information exchanging process.

Five business consultants in Houston, Texas cover US and European customers, 25 in Seoul main operation center cover Asian customers basically all across the Asia. However, for more in-depth information, business consultants in overseas branches of Tokyo, Singapore, Shanghai, Mumbai are in charge of their own region. They feed general information, customized in-depth and analytic information to excellent customers, and sometimes they visit individual companies and show a presentation regarding market forecasts or long-term view according to their own distinct interest.

6. Conclusion

ChemCross is steadily growing and the influence in Asian chemical trading market is getting bigger. Upon this significant performance, it was evaluated to be one of few promising B2B in Asia by CNN. Nevertheless, the major way of creating revenue highly depends on offline support and expected trading volume is hardly caught. Also, providing real value-added service by back-end integration of chemical companies is far-fetched yet. Therefore, it is paid highly attention to by many people in this industry and Asian B2B market as a whole.

Next generation B2B with sustainable profit model has to emerge. As the fierce competition among the B2Bs drive the commission rate on transaction closer to zero, it is becoming evident that B2B cannot make a sustainable business on simple e-marketplace alone.

The prerequisite for a viable B2B is building a solid ground where chemical players can participate as a community. Providing useful and informative chemical-related contents and offering a space to freely share their ideas would be a good lure at the early stage to invite many users in Asian chemical industry. Subsequently, the users must be encouraged to join in

the process of content generation as the information providers themselves. In this way, B2B would evolve to be a true e-marketplace.

The next generation B2B will not be a simple e-marketplace or trading hub. Instead, it will perform holistic functions including information architecture services, knowledge management, business process reengineering, remote collaboration services, sophisticated decision-making assistance services, risk management, and IT consulting.

The next generation B2B would be a hub that would connect various online marketplaces, proprietary chemical contents providers, and IT infrastructure builders. These various participants will jointly provide integrated e-services to the users.

Key B2B players from many distant regions and markets will be able to complement each other in core competences through strategic alliances, M&As, and partnerships. It is foreseeable that active alliance will occur between the Asian and the Western B2Bs as well as among the Asian B2Bs in many different countries.

In conclusion, Asian chemical industry, even though it has several hurdles to tackle, has begun to emerge as a key player in the next generation B2B arena with great potential. With the awareness that the e-business initiative could be the only way to keep abreast with the U.S./European chemical industry, many visionary leaders in Asian chemical industry have steered their organizations to face the challenges of B2B e-commerce. Strong B2B players will soon emerge from Asian chemical communities through active involvement of the users. Through e-business initiative, Asian chemical industry would be able to restructure its

business practices and continue to maintain its competitiveness in the networked economy.

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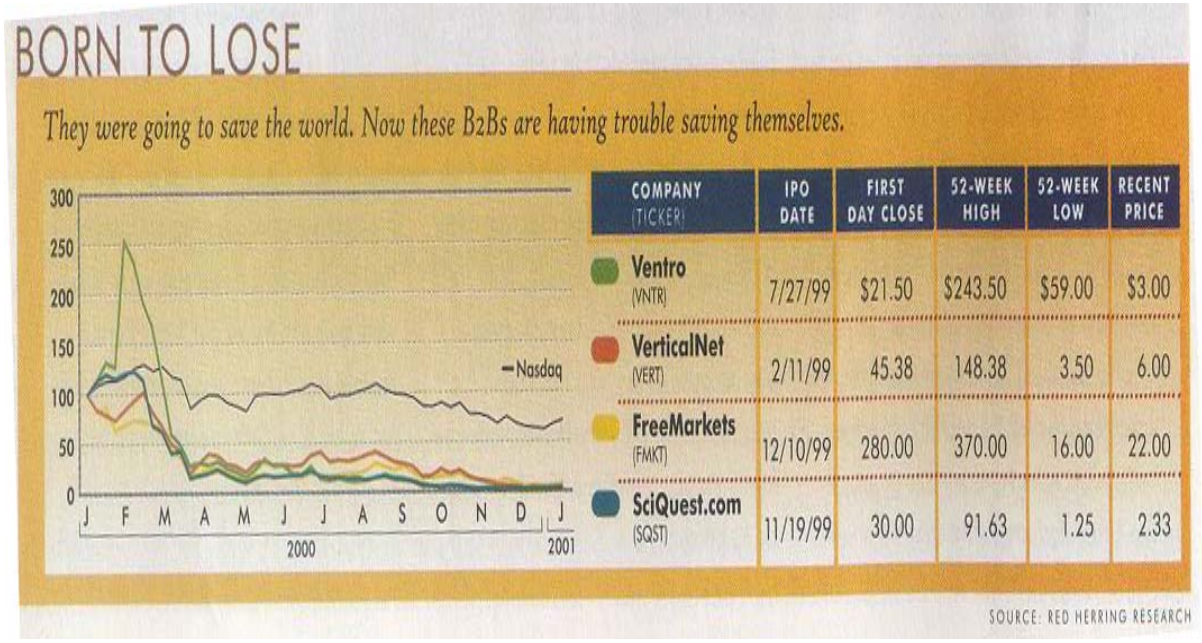
8. Addendum

Table 1. Diagram of stock price changes during the period for selected companies

Source: Red Herring. No. 94 March. 20. 2001



COMPANY (TICKER)	IPO DATE	FIRST DAY CLOSE	52-WEEK HIGH	52-WEEK LOW	RECENT PRICE
Ventro (VNTR)	7/27/99	$21.50	$243.50	$59.00	$3.00
VerticalNet (VERT)	2/11/99	45.38	148.38	3.50	6.00
FreeMarkets (FMKT)	12/10/99	280.00	370.00	16.00	22.00
SciQuest.com (SQST)	11/19/99	30.00	91.63	1.25	2.33

Table 2. Table of comparison of various business models

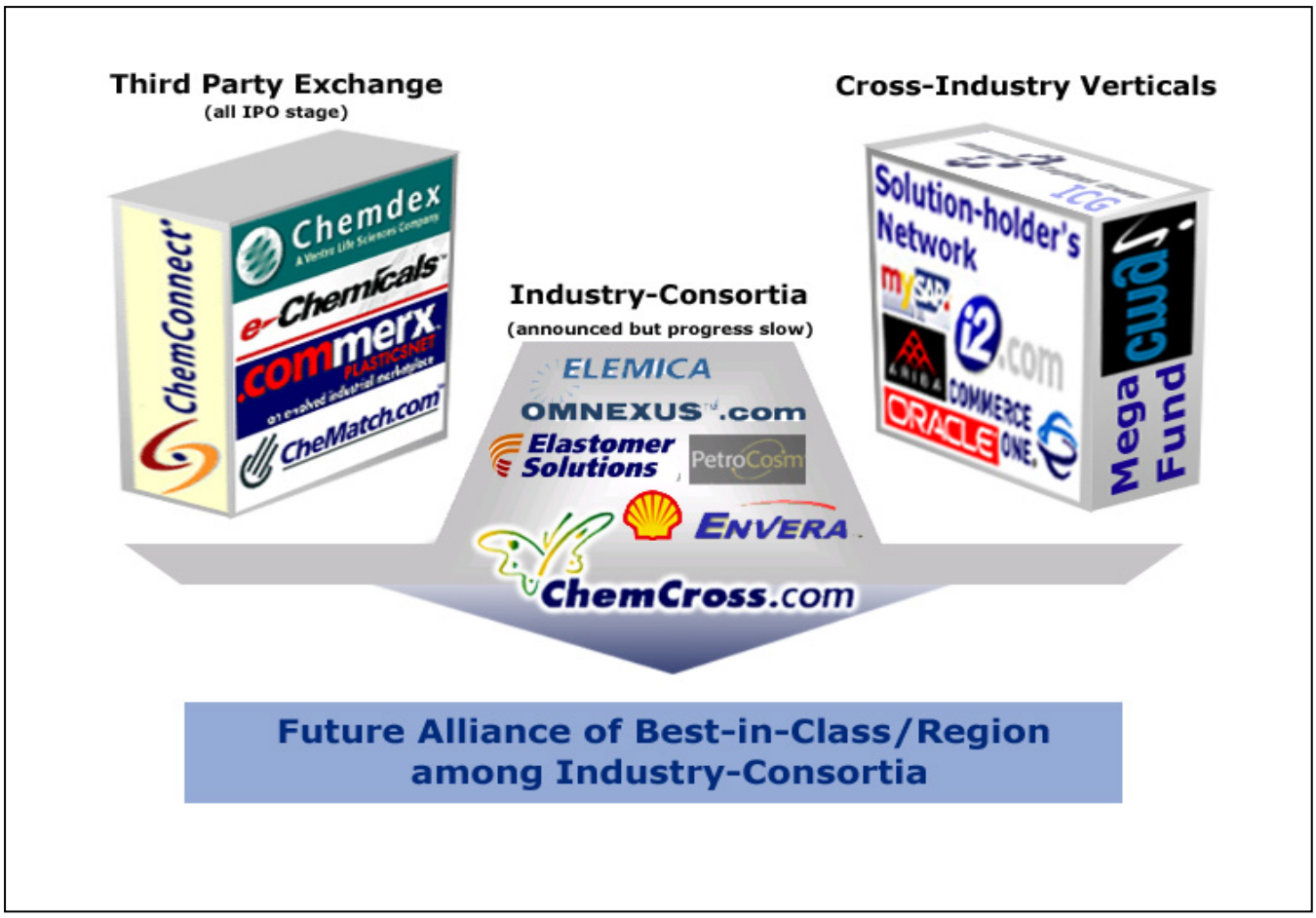


Table 3 List of major chemical B2Bs around the world

Shell Project

- Focuses on the online exchange of upstream chemical products
- Will provide a service of financial derivatives

Envera

- Phase1: B4B network-enabling the partner companies to exchange transaction data Online through XML, including purchase orders, order acknowledgement, shipment notification, receipt notification, invoicing, and order changes
- Phase2: carrier connectivity, freight forward connectivity, supplier-managed inventory, inbound freight monitoring, rail fleet management
- Phase3: international logistics, collaborative forecasting & planning, distributor connectivity

Elemica

- Total paid-in-capital $100 M
- Founding participants: Atofina, BASF, Bayer, BP, Dow, DuPont, Rohm and Haas, and Shell
- Two new investors Millennium Chemicals and logistics company Stinnes

CoatingsMart

- Targeted for the global paints & coatings industry.
- Online catalog of over 500 paints & coatings products

E-Catalysts

- Catalyst producer Grace, VerticalNet, AspenTech Form e-Catalysts
- A neutral marketplace in the refining, chemical, pharmaceutical & biotechnology industries.

Omnexus

- Five founders--BASF, Bayer, Dow, DuPont and Ticona/Celanese.
- Catalogs for five more suppliers--Solvay Plastics, PolyOne, Borealis, DSM Engineering Plastics and LG Chemical--will follow within months.

Todoplasticos.com

- Latin American plastics portal

Table 4. Sizing B2B E-Commerce Market (US$ bn)

1999	China	Aust	S.Korea	Taiwan	HK	India	Sing.	Malay.	Indon	Thai.	Phillip.	Total
Total Transactions	2,172	734	620	772	607	268	221	220	169	199	119	6,102
% of Nominal GDP	219	188	135	190	170	169	157	178	225	234	159	187
Less Private Consumption	476	183	258	236	180	95	115	70	33	35	54	1,735
%of total transactions	48	47	56	58	51	60	82	56	44	41	72	53
Total B2B Transactions	1,696	550	363	535	427	173	106	151	136	164	66	4,367
% of Nominal GDP	171	141	79	132	120	109	75	121	182	193	87	134
Potential B2B e-commerce	1,061	288	149	309	221	82	69	85	82	98	33	2,479
% of Nominal GDP	107	74	32	76	62	52	49	69	110	115	44	76
Penetration (%)	0.25	0.50	0.25	0.38	0.38	0.50	0.25	0.25	0.25	0.38	0.25	0.32
Likely B2B e-Commerce	2.65	1.44	0.37	1.16	0.83	0.41	0.17	0.21	0.21	0.37	0.08	7.91
% of Nominal GDP	0.27	0.37	0.08	0.29	0.23	0.26	0.12	0.17	0.27	0.43	0.11	0.24

Source: MSDW (Moran Stanley Dean Witter) Research

Table 5. B2B E-Commerce Market Size (US$ bn)

Year	China	Australia	S.Korea	Taiwan	HK	India	Sing.	Malay.	Indon.	Thai.	Phillip.	Total
2001 E	16	7	7	5	2	2	2	1	1	1	0	44
2002 E	27	14	13	9	4	4	3	2	2	2	1	80
2003 E	43	26	23	16	7	7	6	4	4	3	1	139
2004 E	70	46	41	29	13	11	10	6	6	5	2	241
2005 E	123	75	68	53	22	19	17	10	10	9	4	409
2006 E	197	112	106	82	36	31	25	16	15	13	6	639

E = Moran Stanley an Witter Estimates

Source: MSDW (Moran Stanley Dean Witter) Internet Research

Table 6. Penetration Rates Assumed (%)

Year	China	Australia	S.Korea	Taiwan	Hong Kong	India	Singapore	Others
2001 E	1.25	2.00	1.63	1.63	2.00	1.25	1.63	1.25
2002 E	2.00	3.50	2.75	2.75	3.50	2.00	2.75	2.00
2003 E	3.00	6.00	4.50	4.50	6.00	3.00	4.50	3.00
2004 E	4.50	10.00	7.25	7.25	10.00	4.50	7.25	4.50
2005 E	7.00	15.00	11.00	11.00	15.00	7.00	11.00	7.00
2006 E	10.00	21.00	15.50	15.50	21.00	10.00	15.50	10.00

E = Moran Stanley an Witter Estimates

Source: MSDW (Moran Stanley Dean Witter) Internet Research

Appendix 1. Company Overview

ChemCross.com

84-11 Namdaemun-ro 5-ka
Yonsei Bldg 17th FL.
Chung-ku, Seoul, Korea
100-753
Tel : 82-2-2259-1312
Fax : 82-2-2259-1360

11999 Katy Freeway Suite625
Houston, TX 77079
Tel : 281-596-0011
Fax : 281-596-0143

Company Introduction

- An Industry Consortium B2B Exchange
- Established : February 22, 2000
- Employees : 70
- Share-Holders : 63 Chemical companies + 3 IT companies
- Location : Houston(Head office), Seoul(Operation Center)
  Shanghai, Tokyo, Singapore, Mumbai
  (Guangzhou, Taiwan)

Shareholders

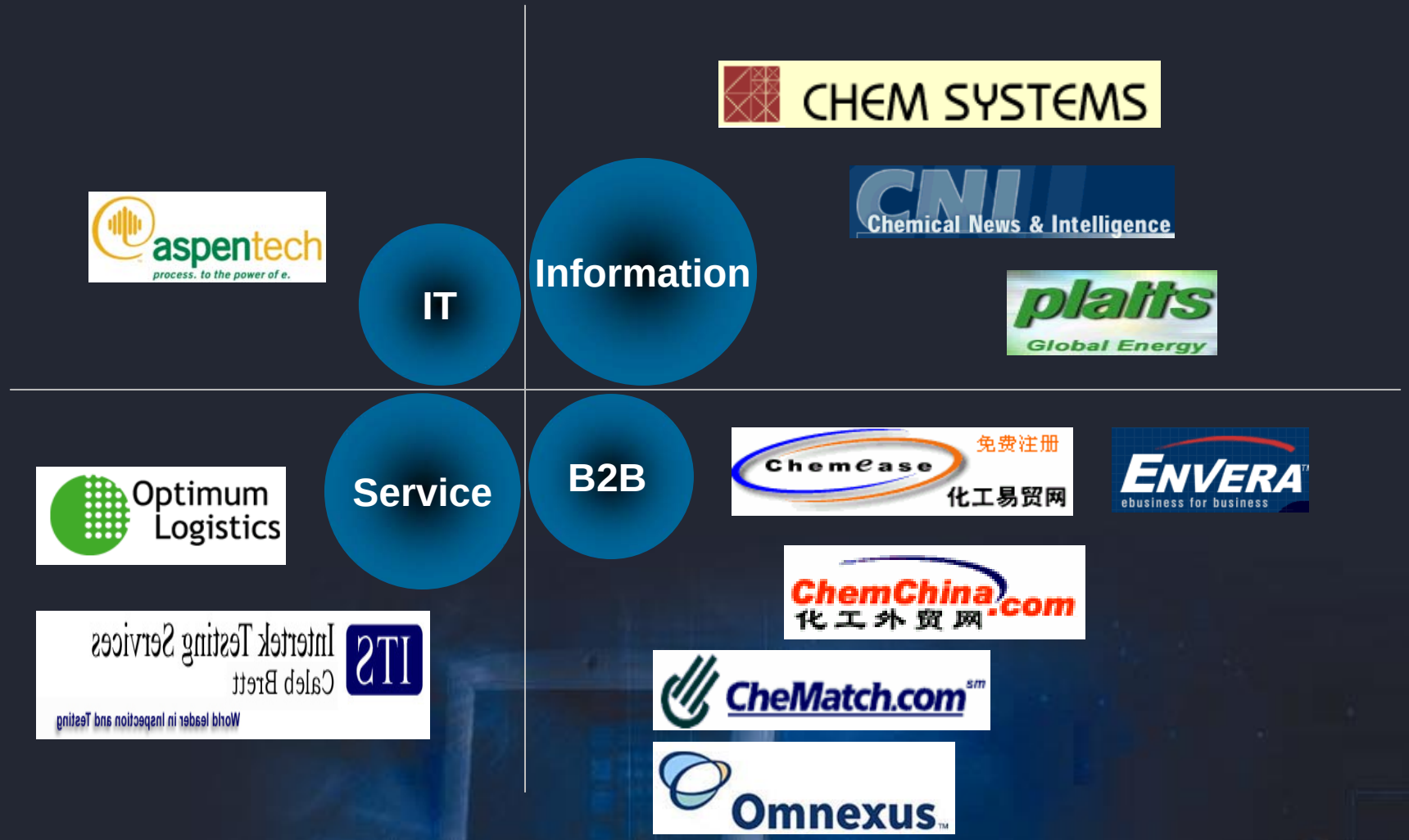
CANADA	1
CHINA	5
INDONESIA	8
JAPAN	12
KOREA	32
TAIWAN	5
THAILAND	1
USA	2

And more…

Company History

Feb 01, 2000	Incorporated in Delaware, U.S.
Feb 22, 2000	Corporate Signing Ceremony with 27 Founder Companies
Mar 10, 2000	Established Houston, H.Q. and Operation Center in Seoul, Korea
Jun 05, 2000	Opened Marketing Office in Shanghai, China
Aug 30, 2000	Completed an Equity Funding from 66 Companies in Chemical Industry
Oct 30, 2000	Official Launch of ChemCross.com online service (MDF Exchange)
Nov 30, 2000	Launched a Shipping e-Marketplace
Jan 05, 2001	Launched Invitation Exchange (Private Trading Space)
Feb 15, 2001	Opened Representative Office in Singapore

Alliance Partners

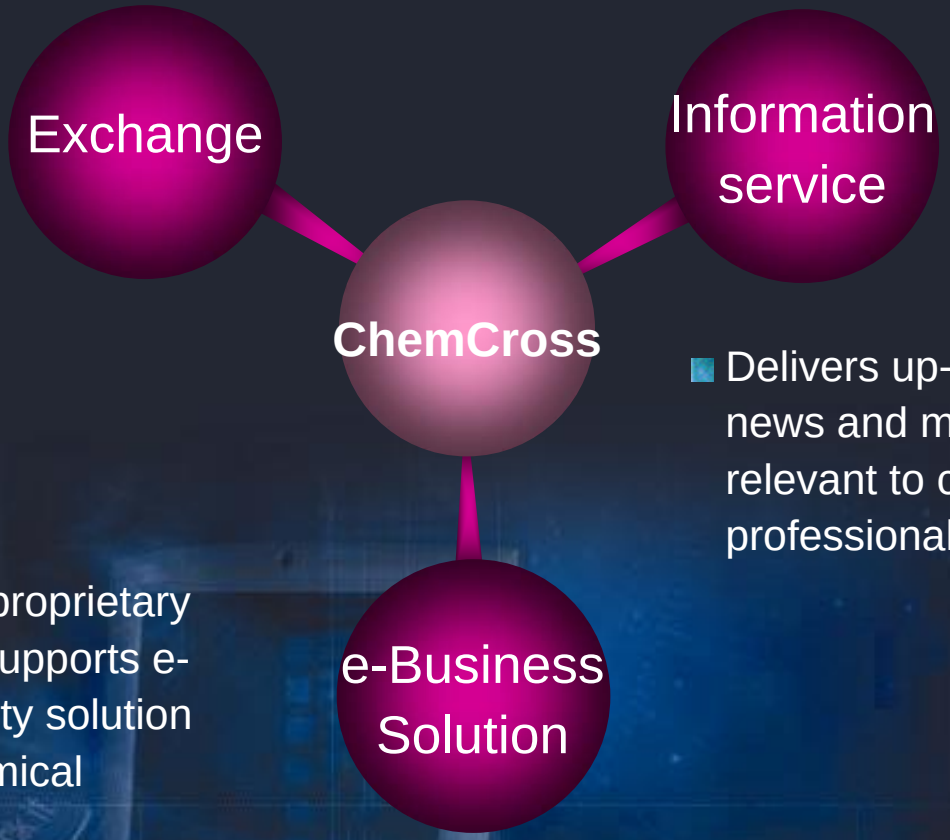


ChemCross Score Card

- Reached quarterly 100Kton in Q1 2001.
- Nearly USD100Million traded since inception in Nov 2000
- Over 2000 corporate members registered.
- Average of 30% growth per month achieved.
- Over 150 companies transacted
- Strong buy-side network established in Mainland China with over 600 Chinese buyers registered.
- Transactions distributed across global markets.
- 70% of deals done among non-consortium members.

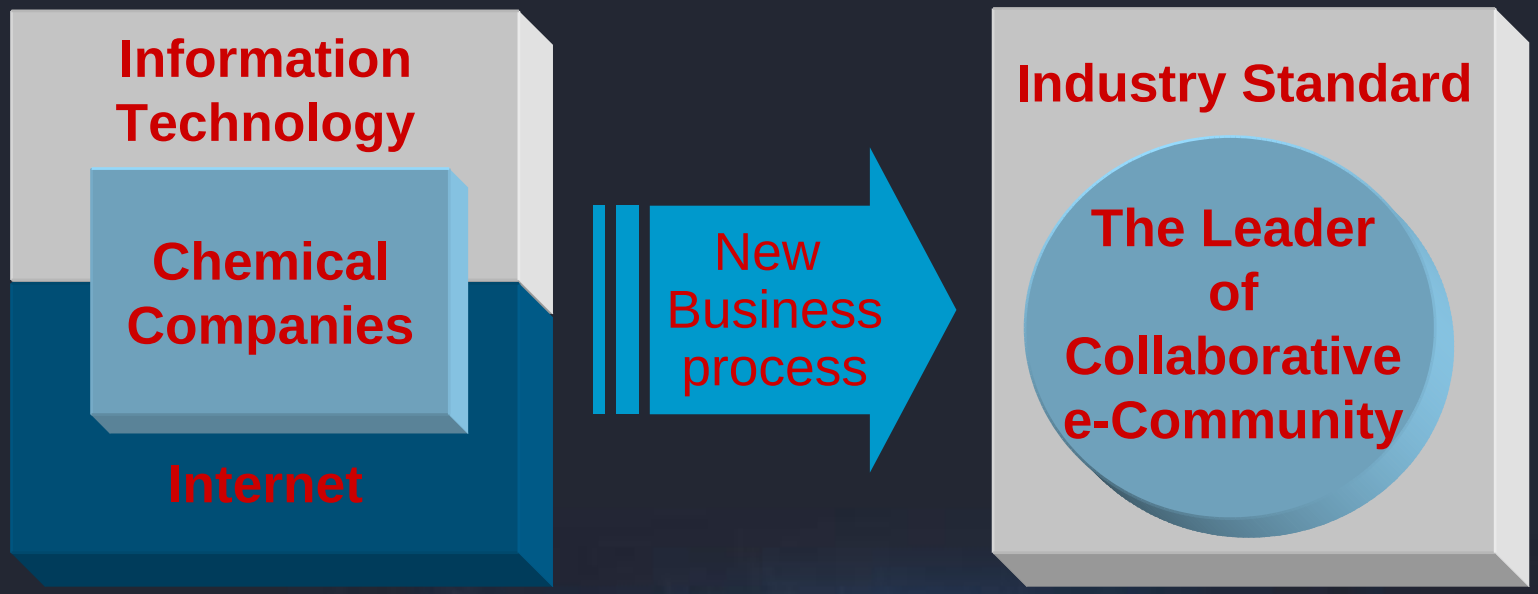
Service Offerings

- Offers the most dynamic and competitive online trading solution, tailored to meet the sophisticated needs of chemical companies.



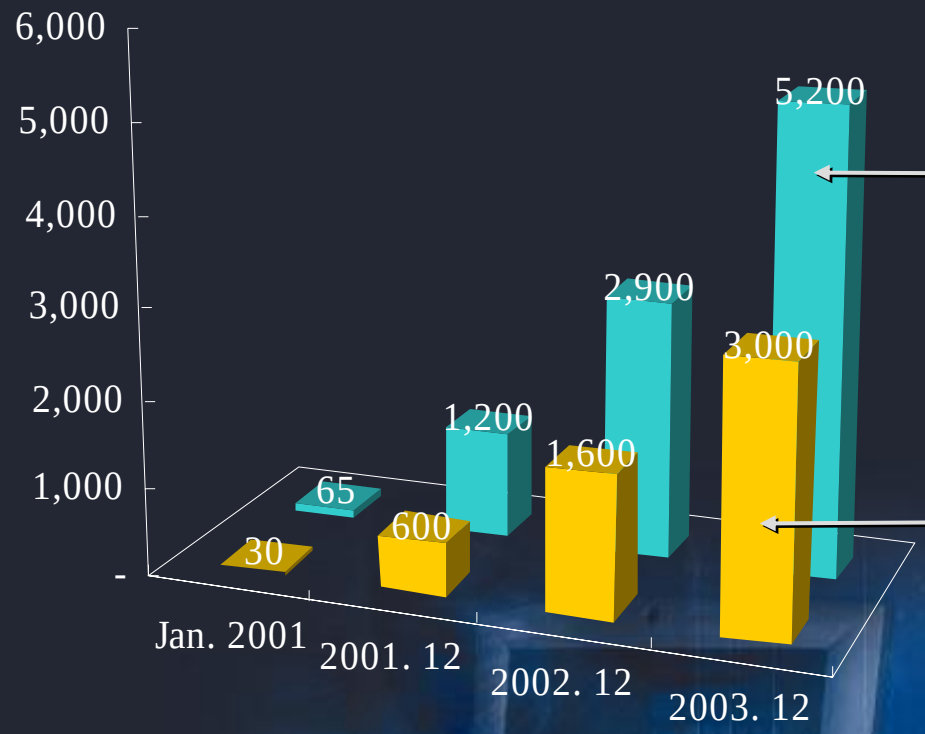
- Delivers up-to-date industry news and market information relevant to chemical professionals
- Offers ChemCross proprietary B2B solutions and supports e-SCM and connectivity solution needs of Asian chemical companies.

Vision



To be the leader in bringing new business processes to the international chemical community through the innovative use of information technology and Internet to build a collaborative e-Community.

Growth Projections



Trading Volume
(KTons)

Trading Amount
(Mil.USD)

Exchange

Off-line Needs + Asia Centric → The Most Effective On-line Exchange

MDF

Multi

Competitive

Anonymous

Open

Commodity Chemicals

Invitation

Private

Customized

-negotiation

Competitive

Branded Chemicals

+

Additional Module

Swap

Forward

Paper trade

Exchange - MDF

Before starting a trading

Screen company

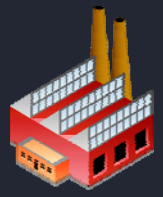
Nobody knows who are over there

Anonymous trading

MDF (Multi, Grouping, Auto cancellation)

Multiple offers with different conditions for the same products

Company A



Company B

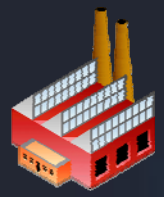
Multi offers

BZ Sell

1. Initial BZ 3KT FOB Korea Oct. $300
2. Initial BZ 2KT FOB Korea Nov. $305
3. Counter BZ 3KT CNF Nov. $315

Counter to Initial No. 2 : BZ 2KT FOB $300

Initial Bid – BZ 3KT CNF Nov. $310



Company C

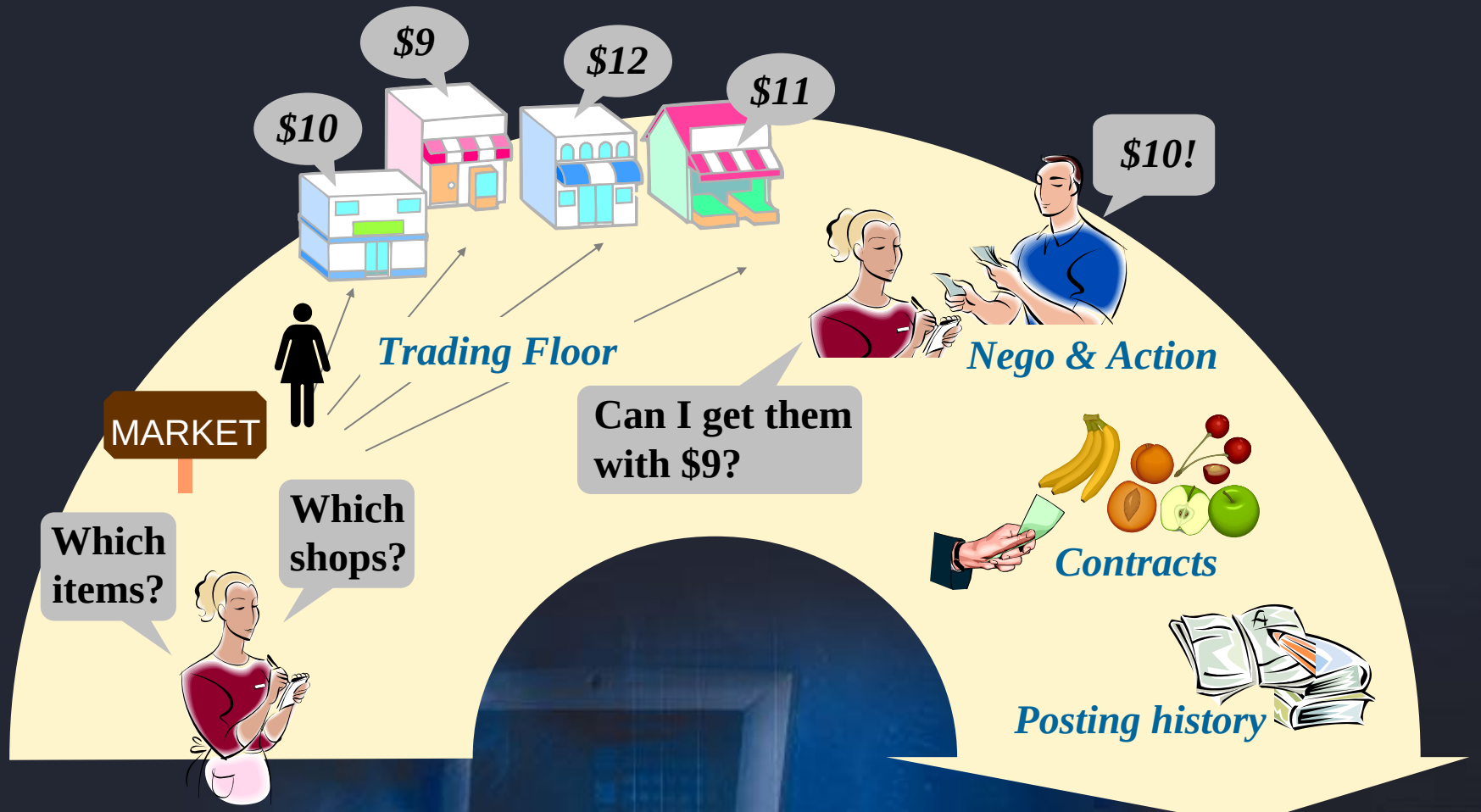
My Counter – BZ 3KT CNF Nov. $315

Deal Done by Company C's acceptance

All other postings are cancelled by system

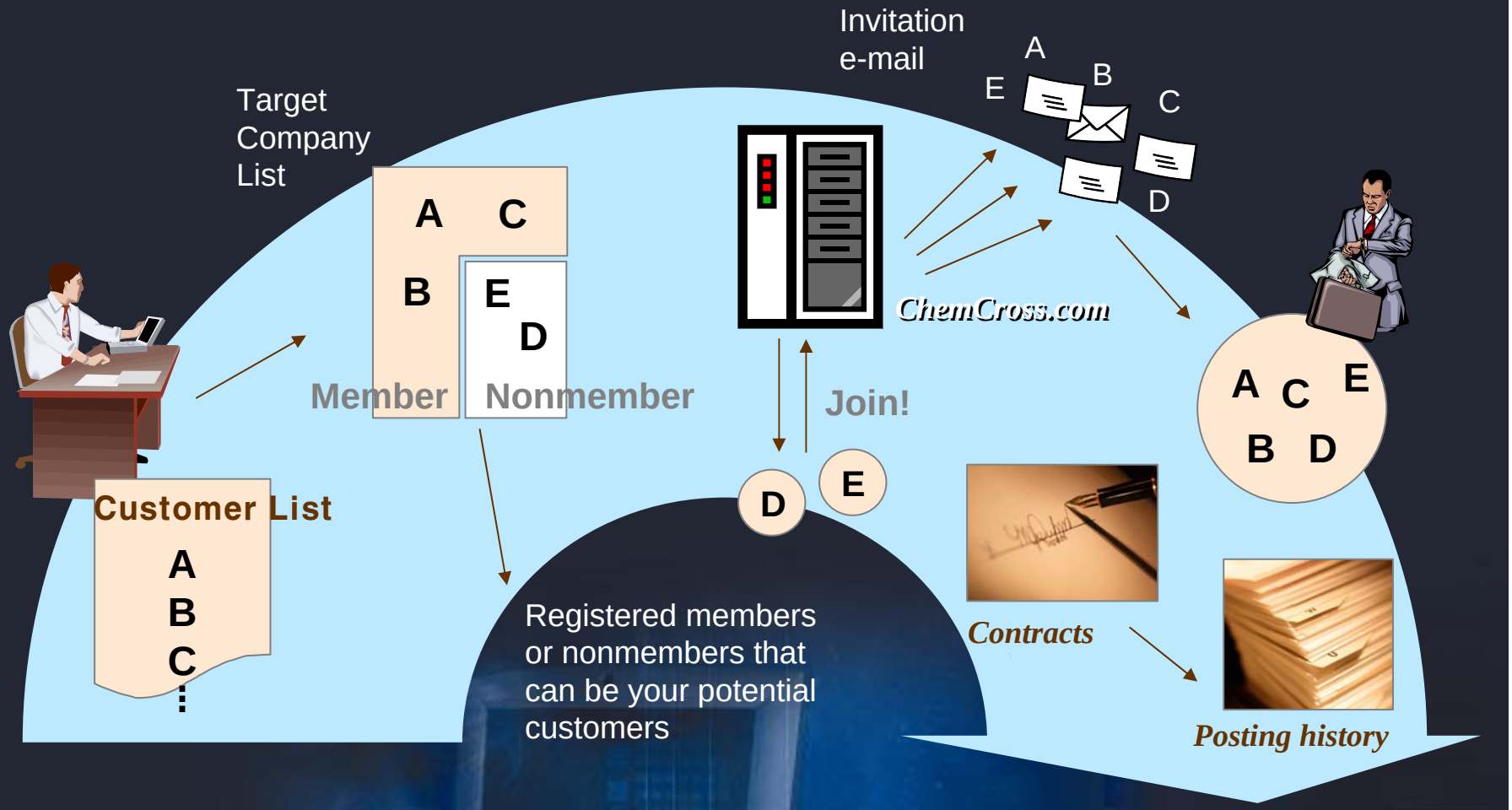
BZ Sell
"Expired"

MDF - Business Flow



Select product → Screen company → Trading Floor → Negotiation & Action → Contracts → Posting History

Invitation Exchange

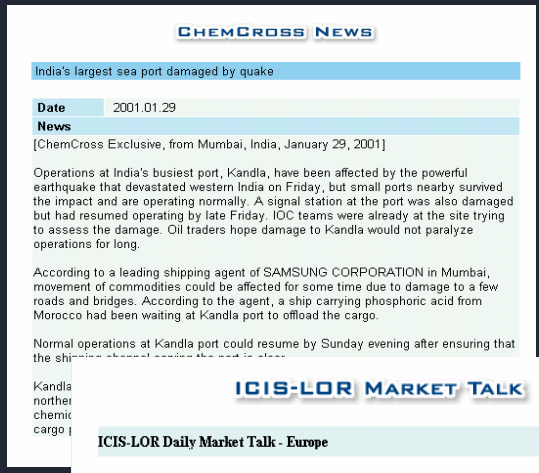


Select product → Invite company → Create posting → Negotiation & Action → Contracts → Posting History

Information Service

- Exclusive Industry News Coverage
  : Exclusive and real-time industry news delivered from ChemCross off-line network

- Up-to-date Chemical News and Price Information via Affiliated Media:
  : Platt's & CNI Headline News, ICIS-LOR Daily Price Report



CHEMCROSS NEWS

India's largest sea port damaged by quake

Date 2001.01.29

News

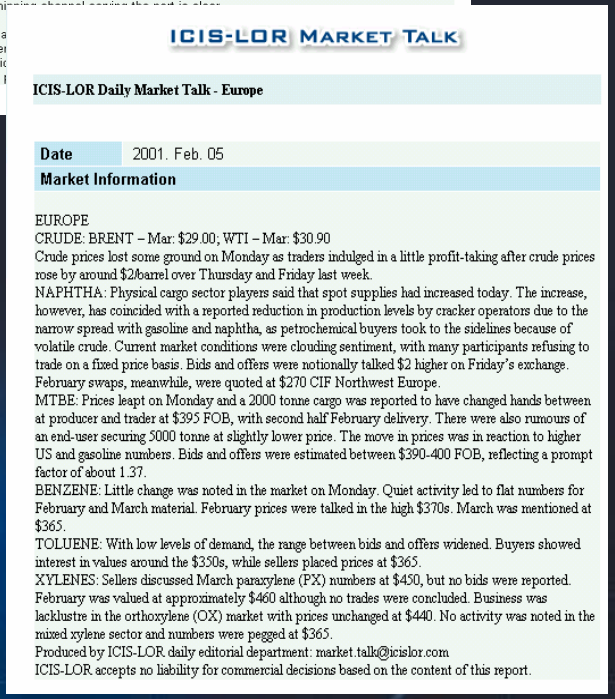
[ChemCross Exclusive, from Mumbai, India, January 29, 2001]

Operations at India's busiest port, Kandla, have been affected by the powerful earthquake that devastated western India on Friday, but small ports nearby survived the impact and are operating normally. A signal station at the port was also damaged but had resumed operating by late Friday. IOC teams were already at the site trying to assess the damage. Oil traders hope damage to Kandla would not paralyze operations for long.

According to a leading shipping agent of SAMSUNG CORPORATION in Mumbai, movement of commodities could be affected for some time due to damage to a few roads and bridges. According to the agent, a ship carrying phosphoric acid from Morocco had been waiting at Kandla port to offload the cargo.

Normal operations at Kandla port could resume by Sunday evening after ensuring that the shipping channel serving the port is clear.

Kandla
northe
chemic
cargo



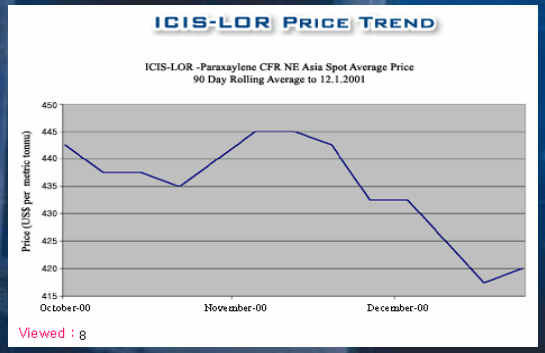
ICIS-LOR MARKET TALK

ICIS-LOR Daily Market Talk - Europe

Date 2001. Feb. 05

Market Information

EUROPE
CRUDE: BRENT – Mar: $29.00; WTI – Mar: $30.90
Crude prices lost some ground on Monday as traders indulged in a little profit-taking after crude prices rose by around $2/barrel over Thursday and Friday last week.
NAPHTHA: Physical cargo sector players said that spot supplies had increased today. The increase, however, has coincided with a reported reduction in production levels by cracker operators due to the narrow spread with gasoline and naphtha, as petrochemical buyers took to the sidelines because of volatile crude. Current market conditions were clouding sentiment, with many participants refusing to trade on a fixed price basis. Bids and offers were notionally talked $2 higher on Friday's exchange. February swaps, meanwhile, were quoted at $270 CIF Northwest Europe.
MTBE: Prices leapt on Monday and a 2000 tonne cargo was reported to have changed hands between at producer and trader at $395 FOB, with second half February delivery. There were also rumours of an end-user securing 5000 tonne at slightly lower price. The move in prices was in reaction to higher US and gasoline numbers. Bids and offers were estimated between $390-400 FOB, reflecting a prompt factor of about 1.37.
BENZENE: Little change was noted in the market on Monday. Quiet activity led to flat numbers for February and March material. February prices were talked in the high $370s. March was mentioned at $365.
TOLUENE: With low levels of demand, the range between bids and offers widened. Buyers showed interest in values around the $350s, while sellers placed prices at $365.
XYLENES: Sellers discussed March paraxylene (PX) numbers at $450, but no bids were reported. February was valued at approximately $460 although no trades were concluded. Business was lacklustre in the orthoxylene (OX) market with prices unchanged at $440. No activity was noted in the mixed xylene sector and numbers were pegged at $365.
Produced by ICIS-LOR daily editorial department: market.talk@icislor.com
ICIS-LOR accepts no liability for commercial decisions based on the content of this report.



Information Service

Extensive Market Trend Analysis

: Market trend for key products offered exclusively by in-house business consultants.

- Asian Price Index
- Daily and weekly market report by region (Asia, US & Europe)
  : BTX, SM, PX, Plastics, Methanol, etc….

In-Depth Regional Focus

Zeroed-in local market information in the various regions in Asia

- Chinese Local Price(RMB) Update (Daily)
- Chinese Market Report (Weekly)

CHEMCROSS SUMMARY

By collecting and analyzing the market price on a daily basis, Chemcross Summary provides updated information based on which the users can make decisions on designated items.

Product	Grade	Price				Trend	Shipment	Updated
Benzene		FOB	US Gulf	1.32-1.33	USD/gal	↓	Feb	2001.02.05
Toluene		FOB	US Gulf	1.07-1.10	USD/gal	↓	Mar	2001.02.05
Xylenes(mixed)		FOB	US Gulf	1.12-1.14	USD/gal	–	Mar	2001.02.05
Styrene		FOB	US Gulf	0.28-0.29	USD/lb	↓	Feb	2001.02.05
Benzene		CIF	ARA	360-375	USD/mt	↑	Feb	2001.02.05
Styrene		CIF	ARA	625-635	USD/mt	–	Feb	2001.02.05
p-Xylene		CIF	ARA	445-465	USD/mt	–	Feb	2001.02.05
Polyethylene		CFR	China	660-710	USD/mt	↑	Feb	2001.02.05
Polypropylene	yarn	CFR	China	595-610	USD/mt	↑	Feb	2001.02.05
Polyvinyl chloride		CIF	China	570-590	USD/mt	↑	Feb	2001.02.05

[Previous] 1 2 3 4 5 6 7 8 9 10 [Next]

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CHEMCROSS NEWS

PX Market Trend in China (Feb 26 - Mar 5)

Date 2001.03.12

News

Chemease.com, March 12, 2001 - Last week's domestic para- xylene (PX) market prices showed an upward trend.
Shandong market: RMB 4,200-4,400/mt.
North China: RMB 4,200-4,400/mt.
Both markets increased about RMB 100/mt.

Factors that influenced the market:

1. The market prices of domestic PX were rising steadily due to tight supply.

2. After overcoming uncertainties the market became brisk.

3. Presently in Asia, there are 4 to 5 units of para xylene plants were under maintenance with a combined capacity of 1 million tons/year. Other facilities remained at operating rates of 80-90%.

Market Forecast

Based on historical market performance, PX demand usually increases after entering the second season. The reasons are: factories increase their production of soft drink cans and polyester before summer comes. Therefore, the demand for PX will increase. Regarding the recent domestic PX market, after a week of upward movement the market will need time to stabilize. Little fluctuation in market price is expected for this week.

Extensive Industry Network

"Extensive Information Network Rooted in the Industry"

- Backed-up by committed shareholders and strategic partners
- Offices located in the key regions in Asia.
- Crew of product experts and business consultants lined up.
- Covers broad range of chemical products in petrochemicals, plastics, organic, and specialty chemicals segments.

Direct Customer Support

- ✓ One-on-one. Direct. Real-time.
- ✓ Dedicated market consultants ready to support your sophisticated online trading needs.
- ✓ Expert assistance offered by business facilitators.

Appendix 2. ChemCross' Proprietary Online Trading Module

MDF Exchange

ChemCross Marketplace

ChemCross.com

The New Exchange Standard

(MDF Negotiation)

ChemCross Marketplace

- *What is MDF Negotiation ?*
- *Why MDF Negotiation ?*
- *MDF Exchange Business Flow*
- *Company Master System*
- *Key Features of ChemCross*

What is MDF?

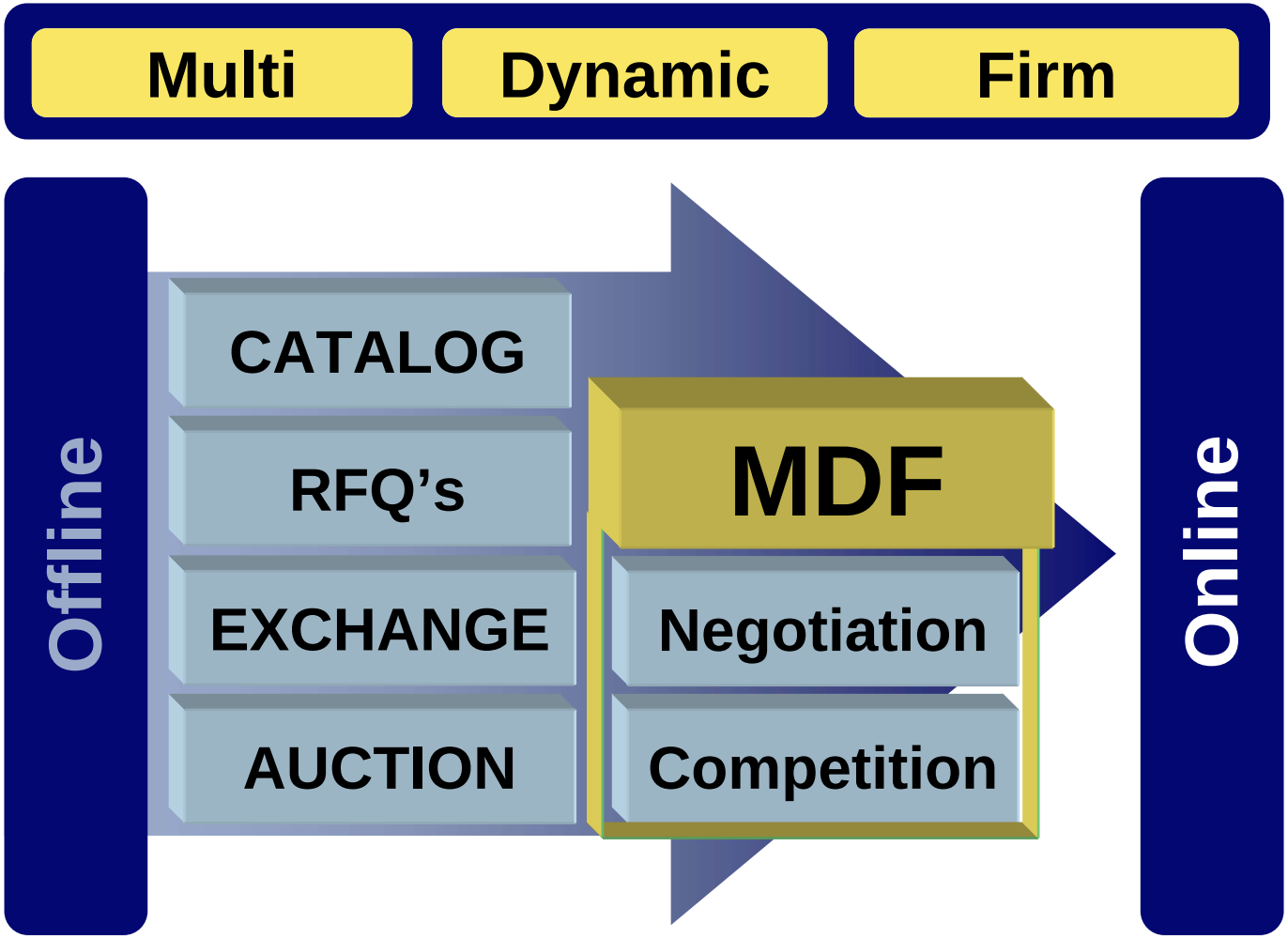
ChemCross.com

Business Processes
(Deal Matchmaking System)

- Catalogue
- RFQ / RFO
- Tender
- Auction / Rev. Auction
- Exchange / Negotiation
- Joint Purchasing

What is MDF?

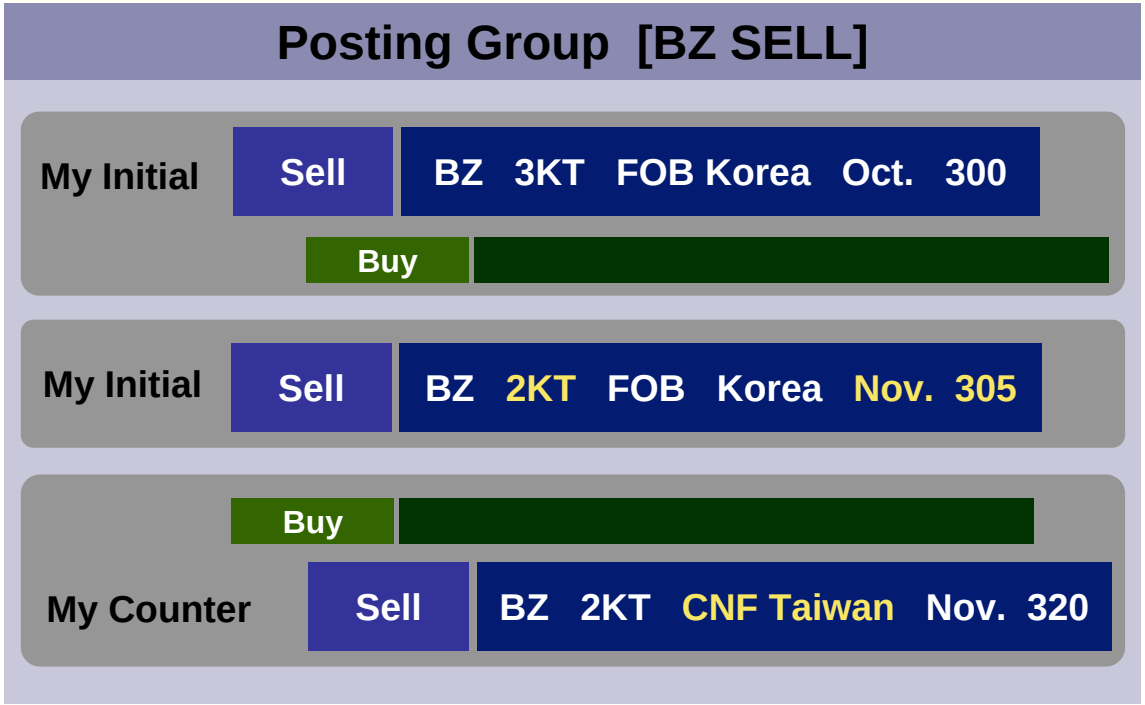
ChemCross.com



Grouping and Auto-Cancellation

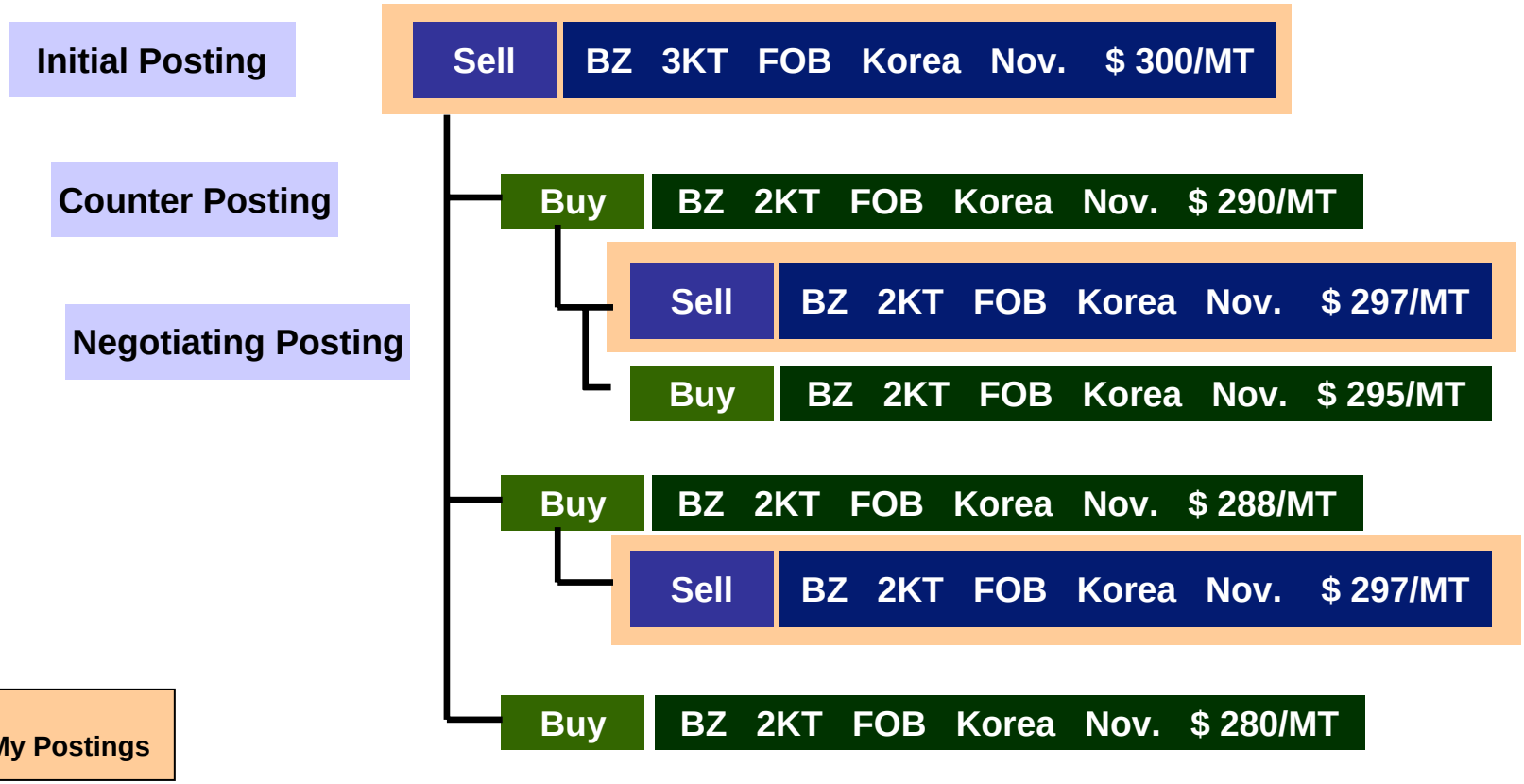
ChemCross.com

My Intention : To Sell Benzene, 2~3KT, Oct.~Nov. 295 - 300



Grouping and Auto-Cancellation

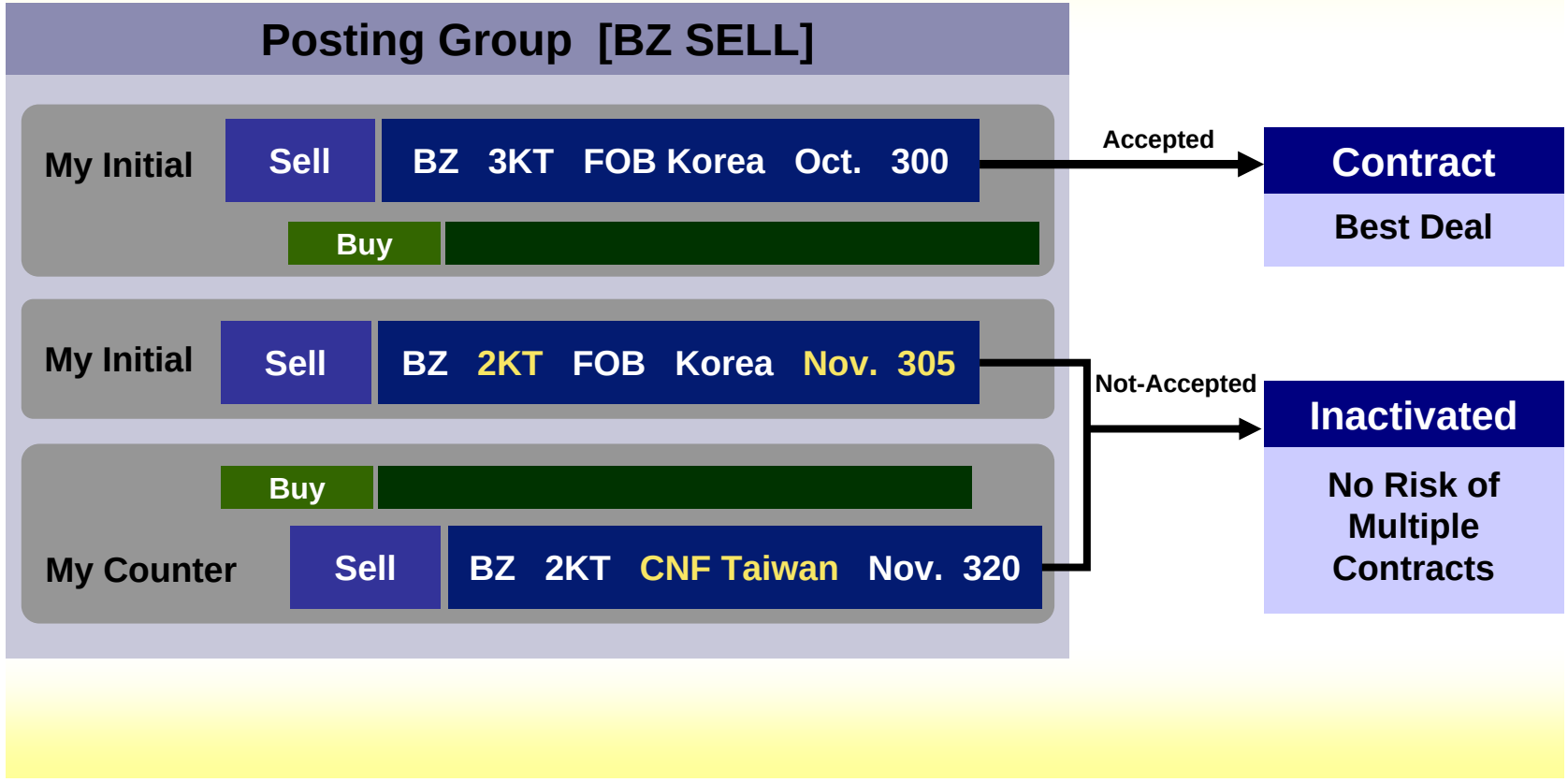
Negotiation Room



Grouping and Auto-Cancellation

ChemCross.com

My Intention : To Sell Benzene, 2~3KT, Oct.~Nov. 295 - 300



Why MDF?

ChemCross.com

	Off - Line Other Exchanges	ChemCross MDF
Offer/Bid	Single & Limited	Multiple & Flexible
Negotiation	Static & Sequential	Dynamic & Simultaneous

Why MDF?

ChemCross.com

ChemCross MDF

Multiple & Flexible

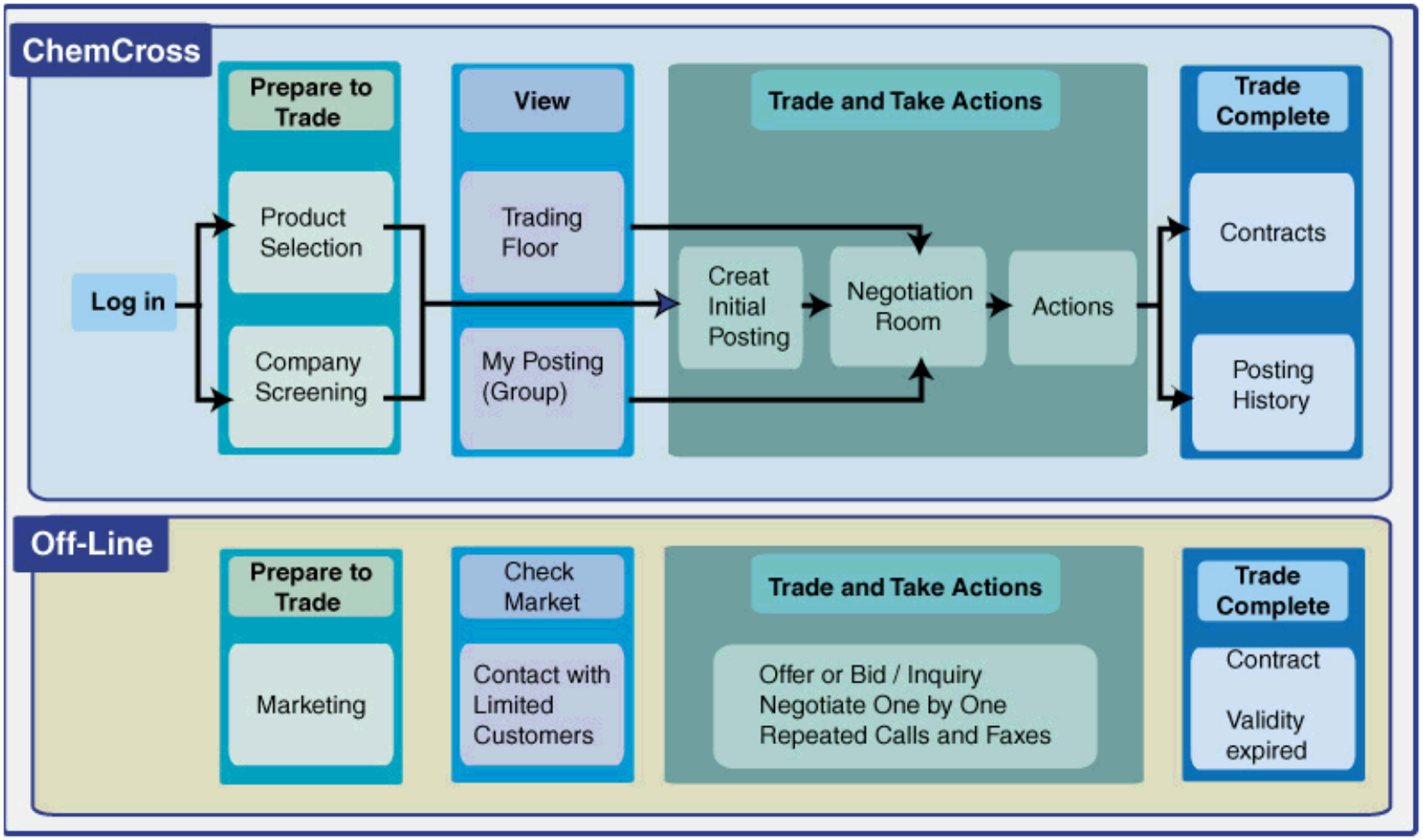
Dynamic & Simultaneous

Benefits

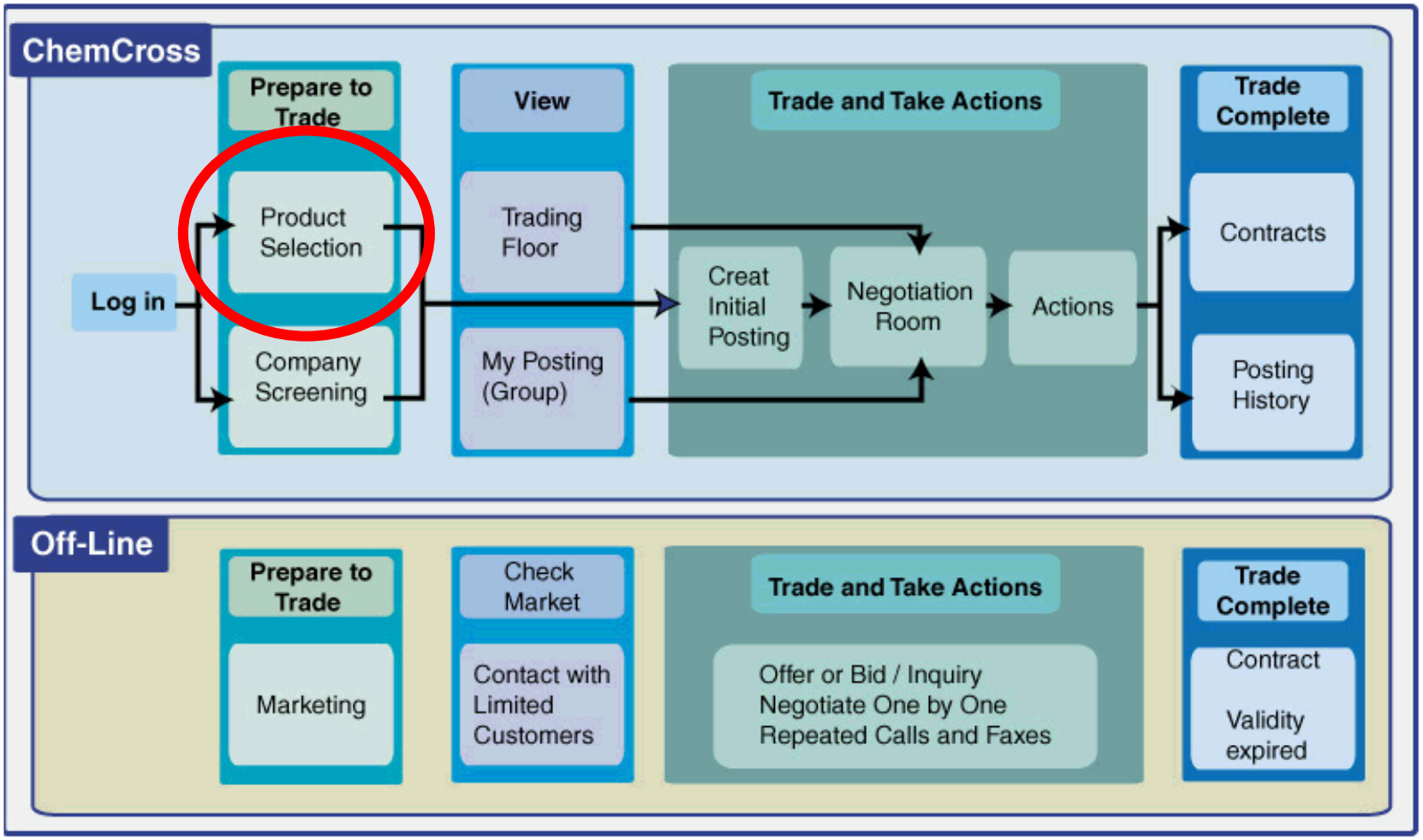
“Best Deal”

- **High Liquidity**
- **More Opportunities**
- **Real Time Market Access**

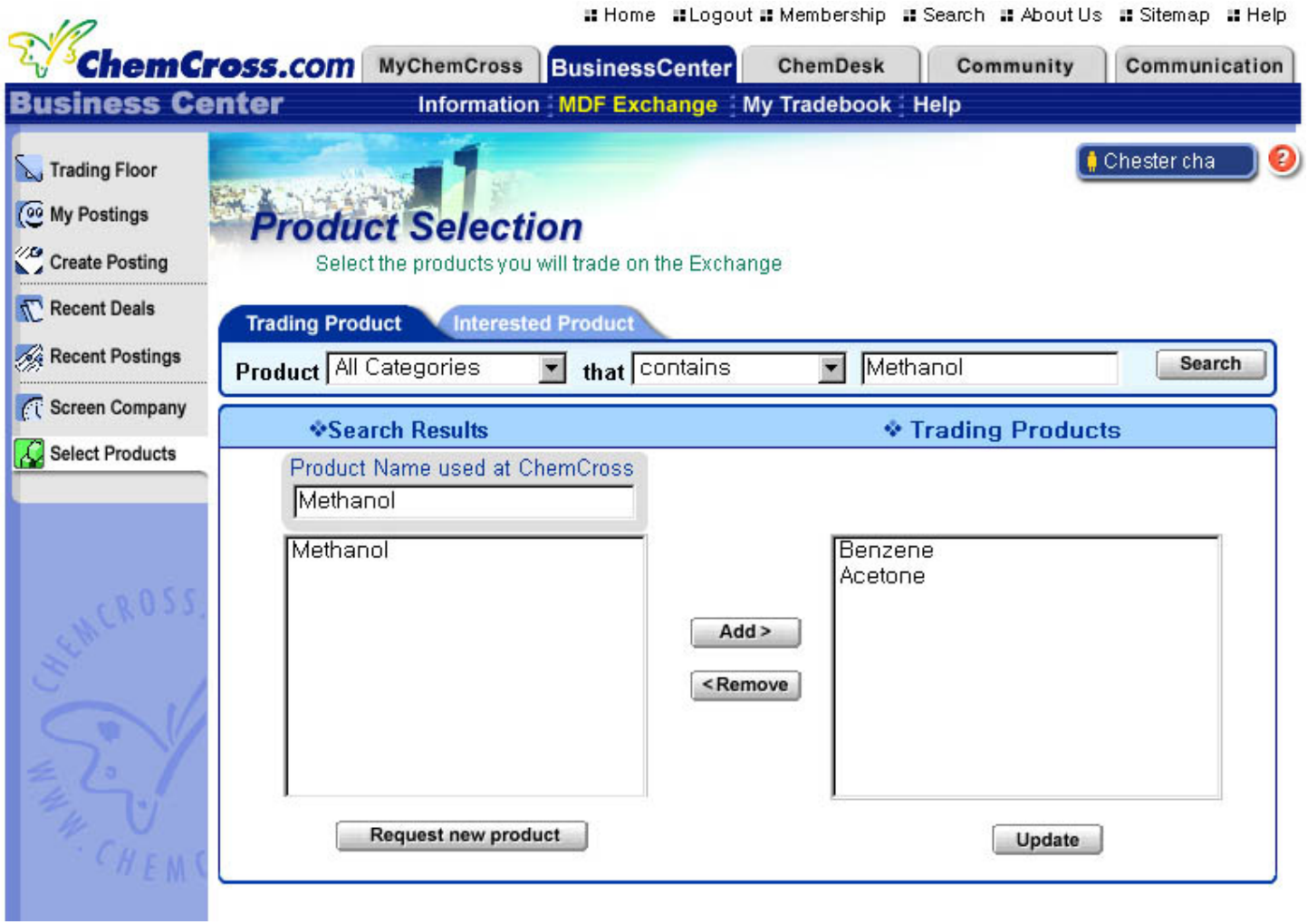
MDF Exchange Business Flow



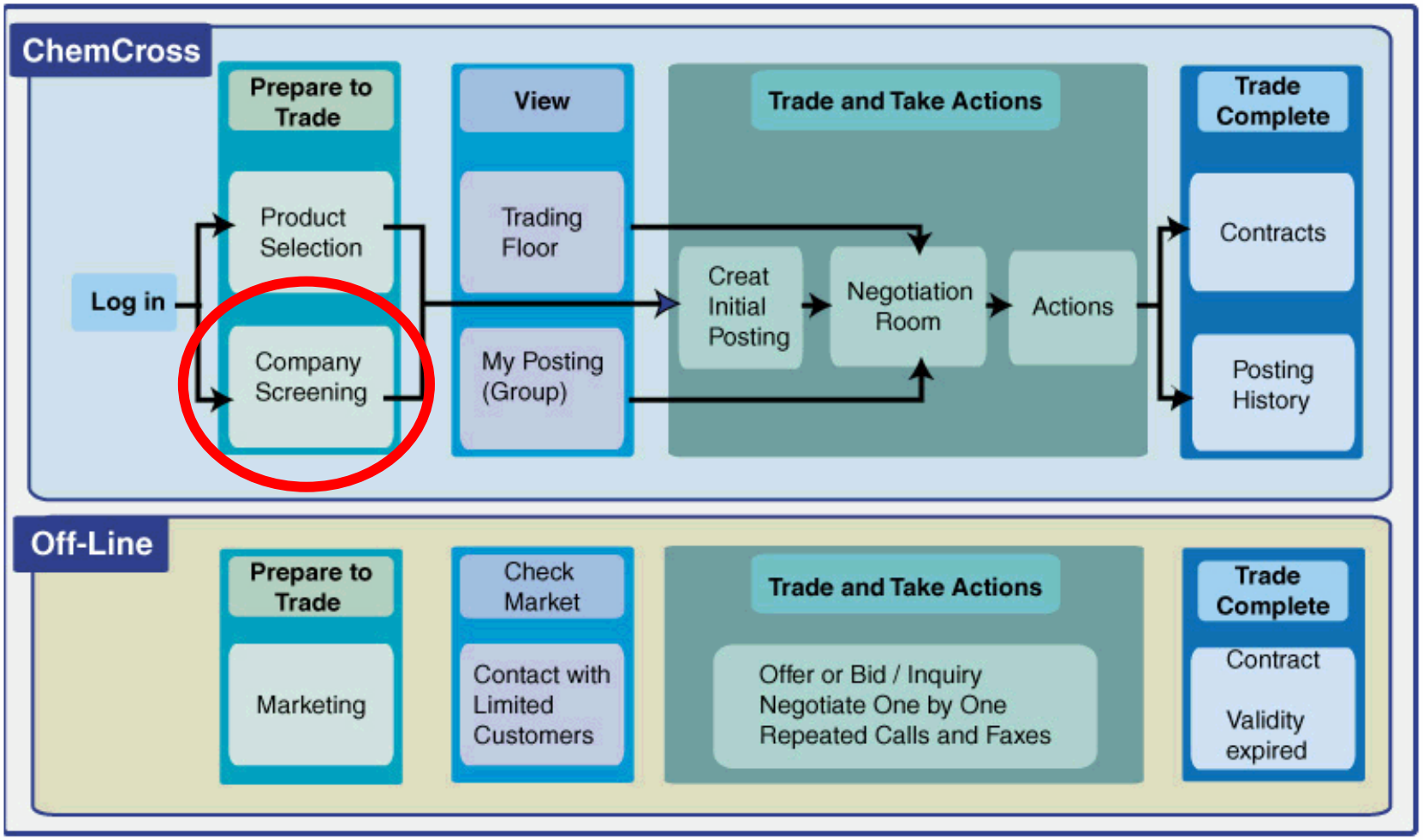
MDF Exchange Business Flow



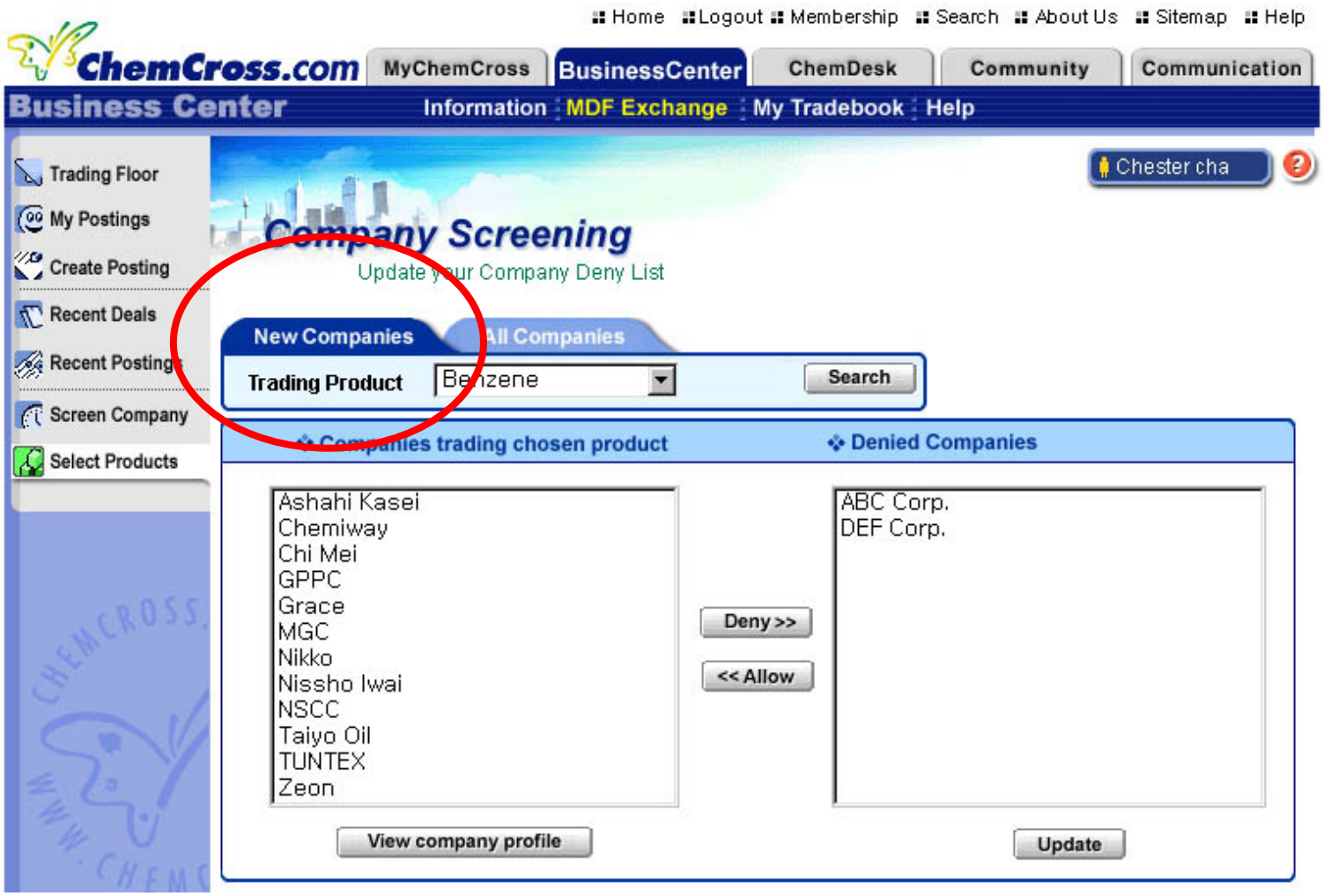
Product Selection



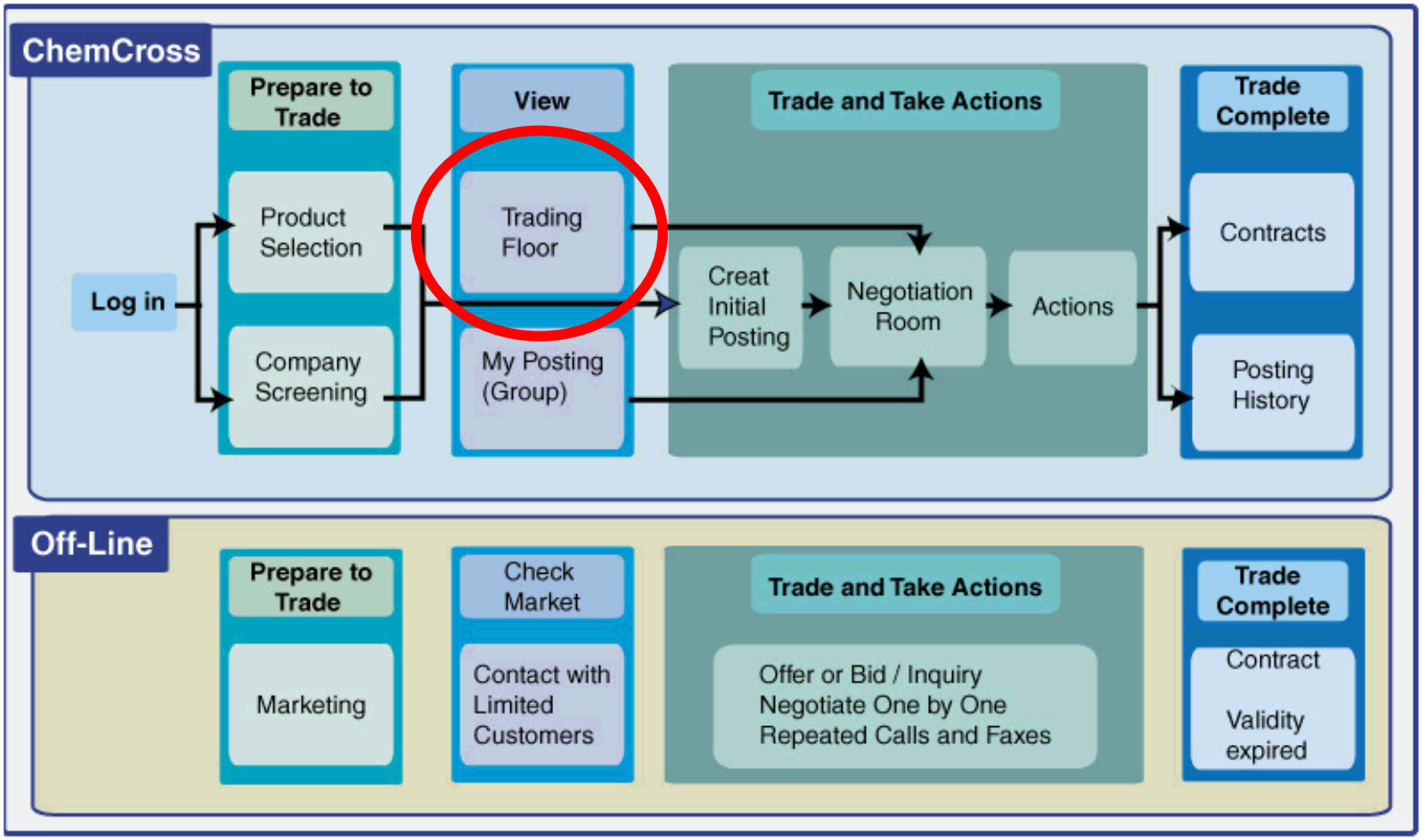
MDF Exchange Business Flow



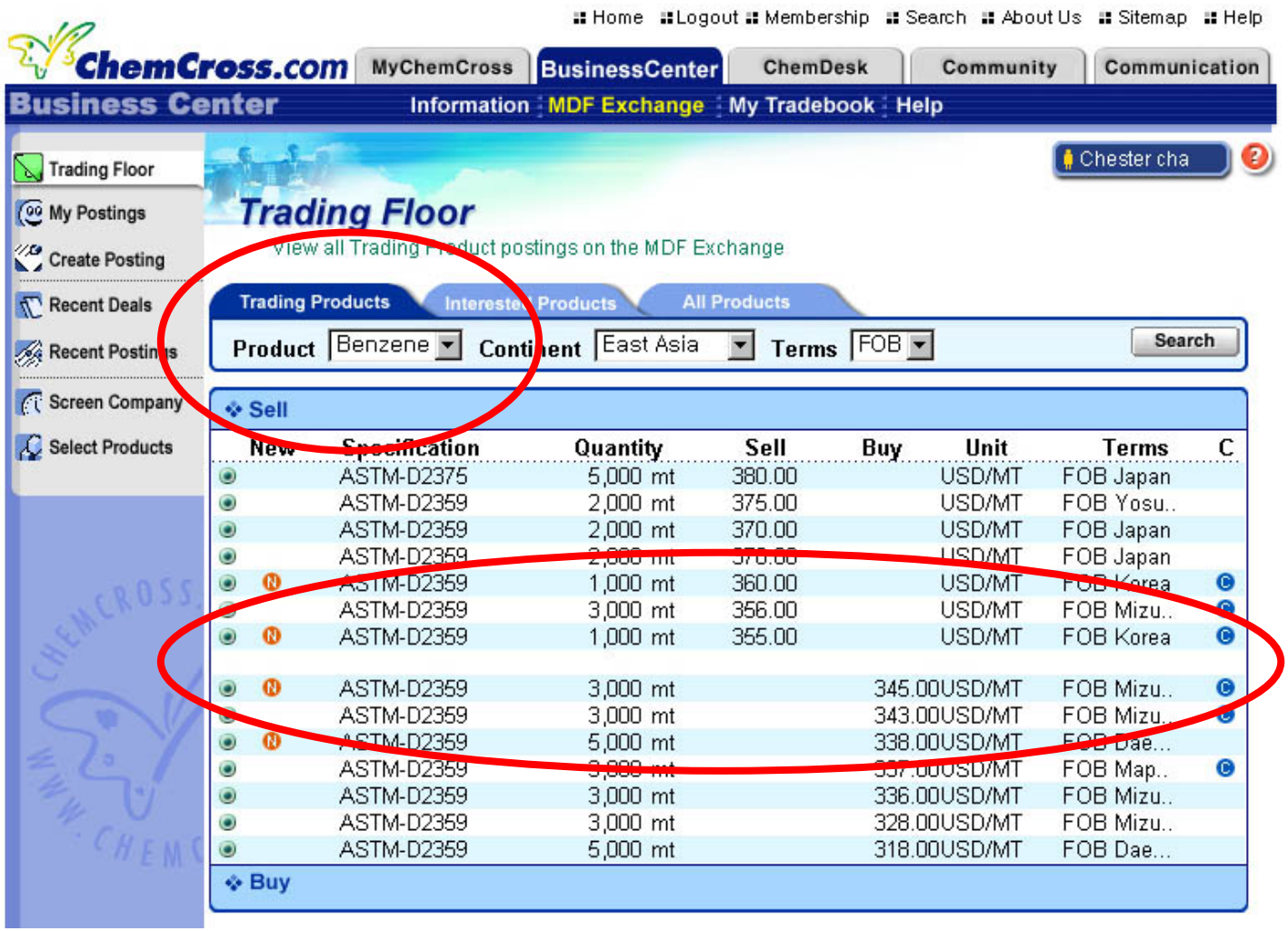
Company Screening



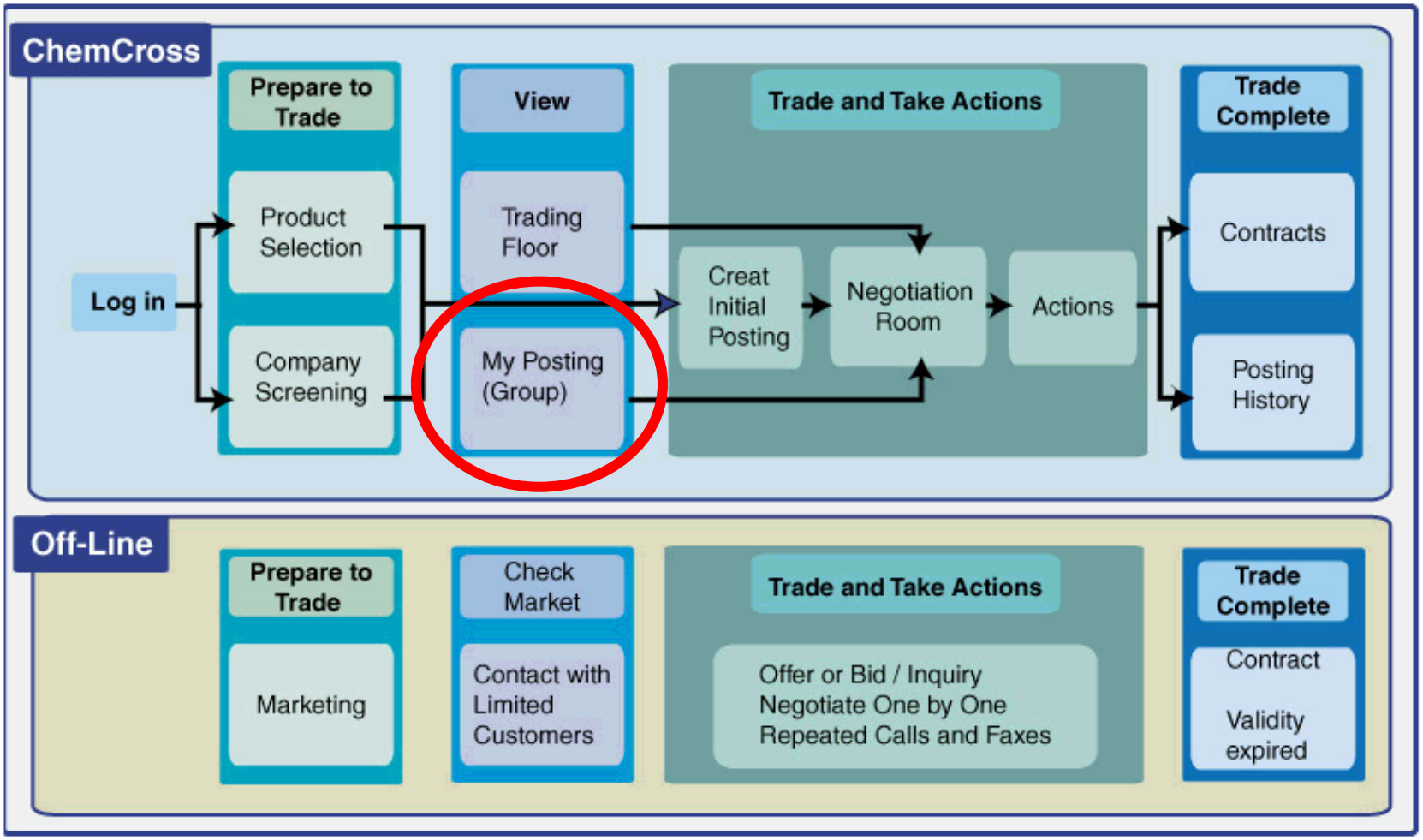
MDF Exchange Business Flow



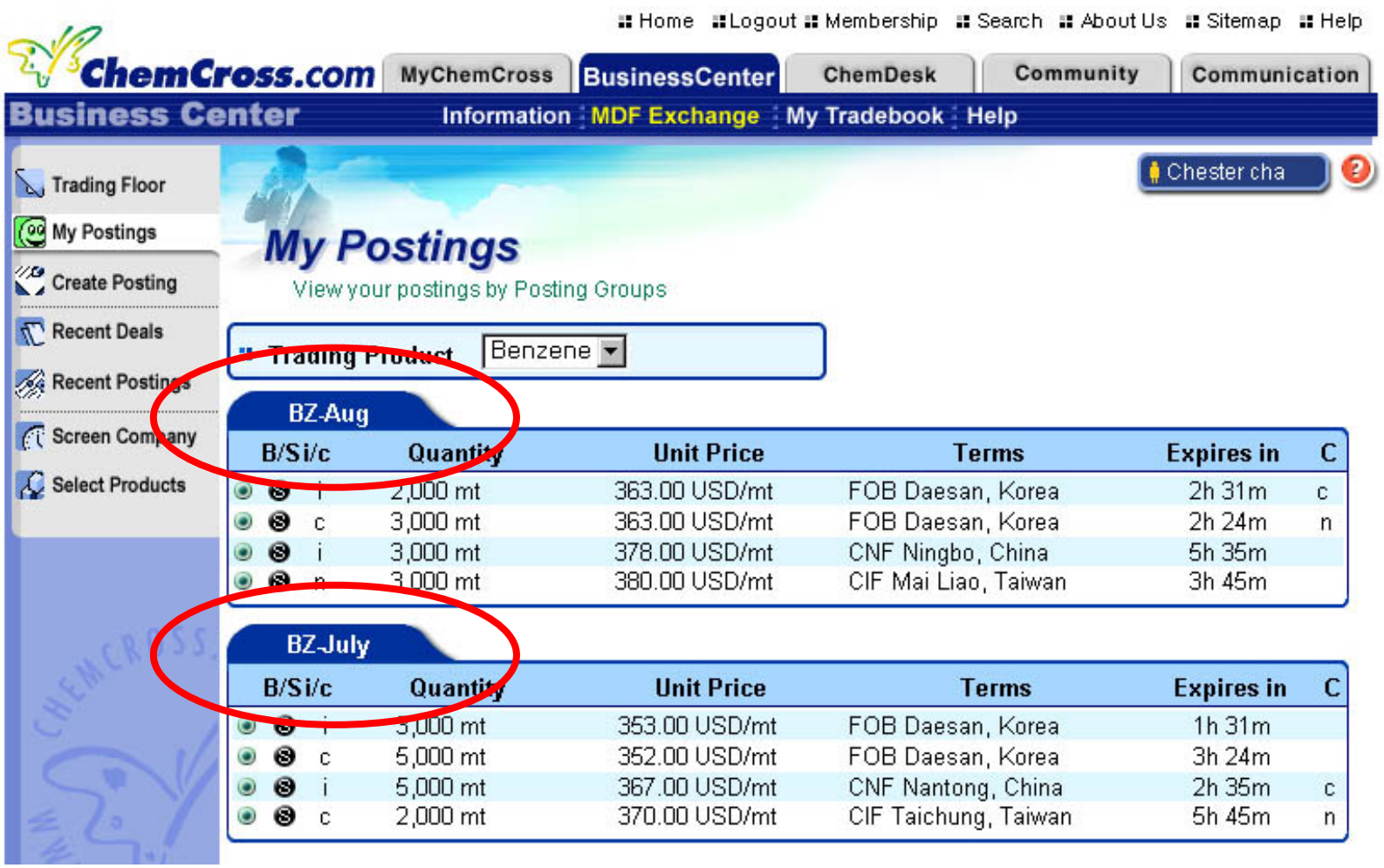
Trading Floor



MDF Exchange Business Flow



My Postings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Membership
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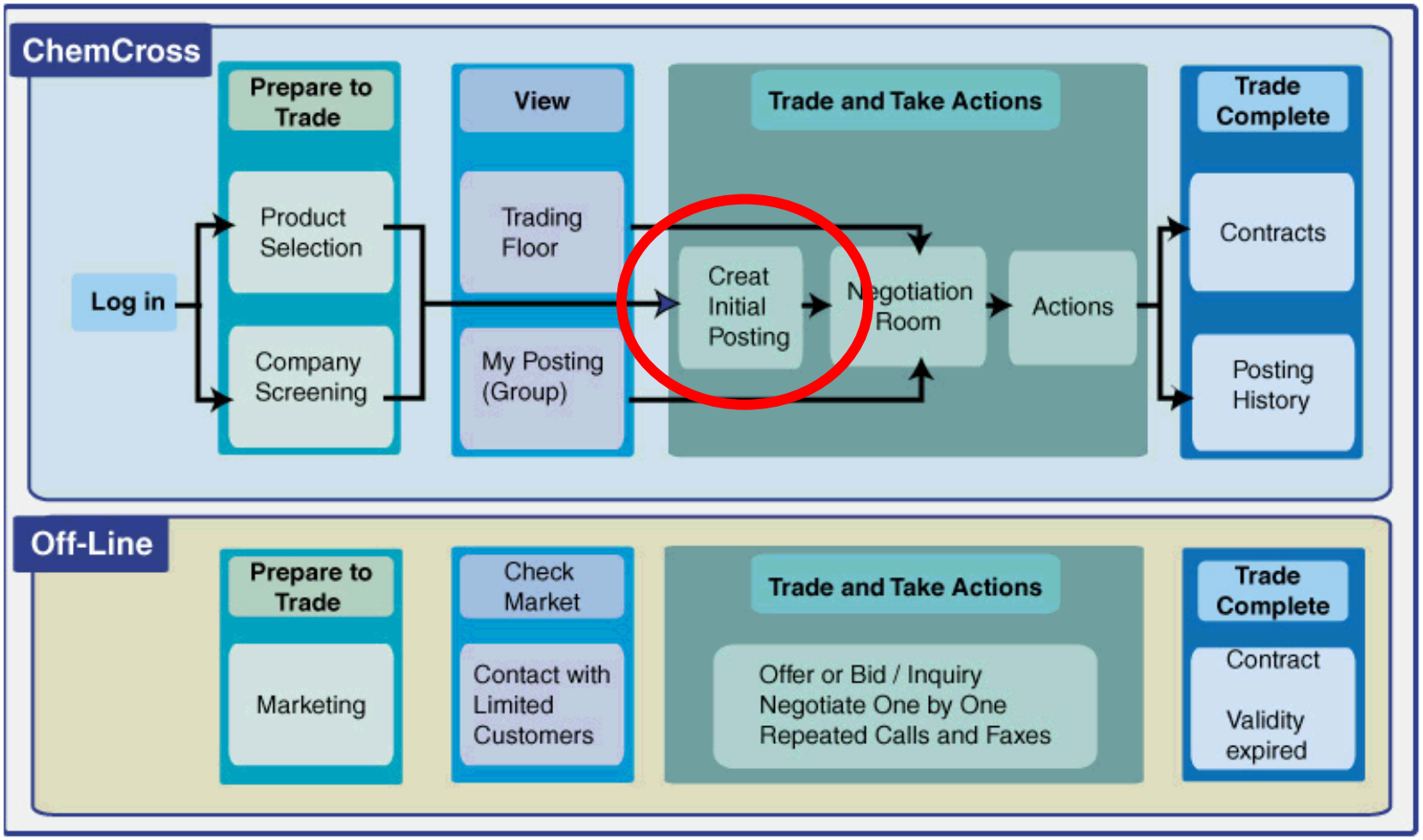
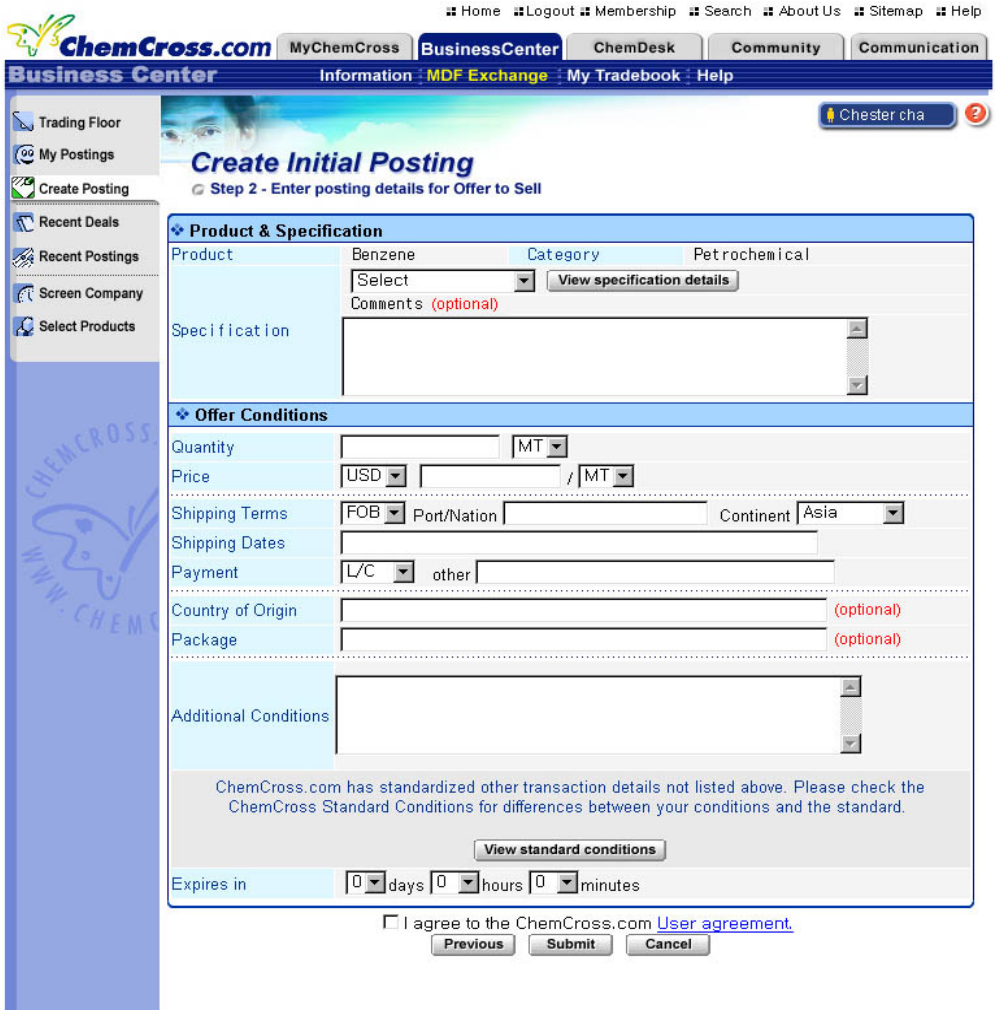
Trading Product
Benzene
BZ-Aug
B/S i/c
Quantity
Unit Price
Terms
Expires in
C
2,000 mt 363.00 USD/mt FOB Daesan, Korea 2h 31m c
c 3,000 mt 363.00 USD/mt FOB Daesan, Korea 2h 24m n
i 3,000 mt 378.00 USD/mt CNF Ningbo, China 5h 35m
n 3,000 mt 380.00 USD/mt CIF Mai Liao, Taiwan 3h 45m
BZ-July
B/S i/c
Quantity
Unit Price
Terms
Expires in
C
i 5,000 mt 353.00 USD/mt FOB Daesan, Korea 1h 31m
c 5,000 mt 352.00 USD/mt FOB Daesan, Korea 3h 24m
i 5,000 mt 367.00 USD/mt CNF Nantong, China 2h 35m c
c 2,000 mt 370.00 USD/mt CIF Taichung, Taiwan 5h 45m n

MDF Exchange Business Flow

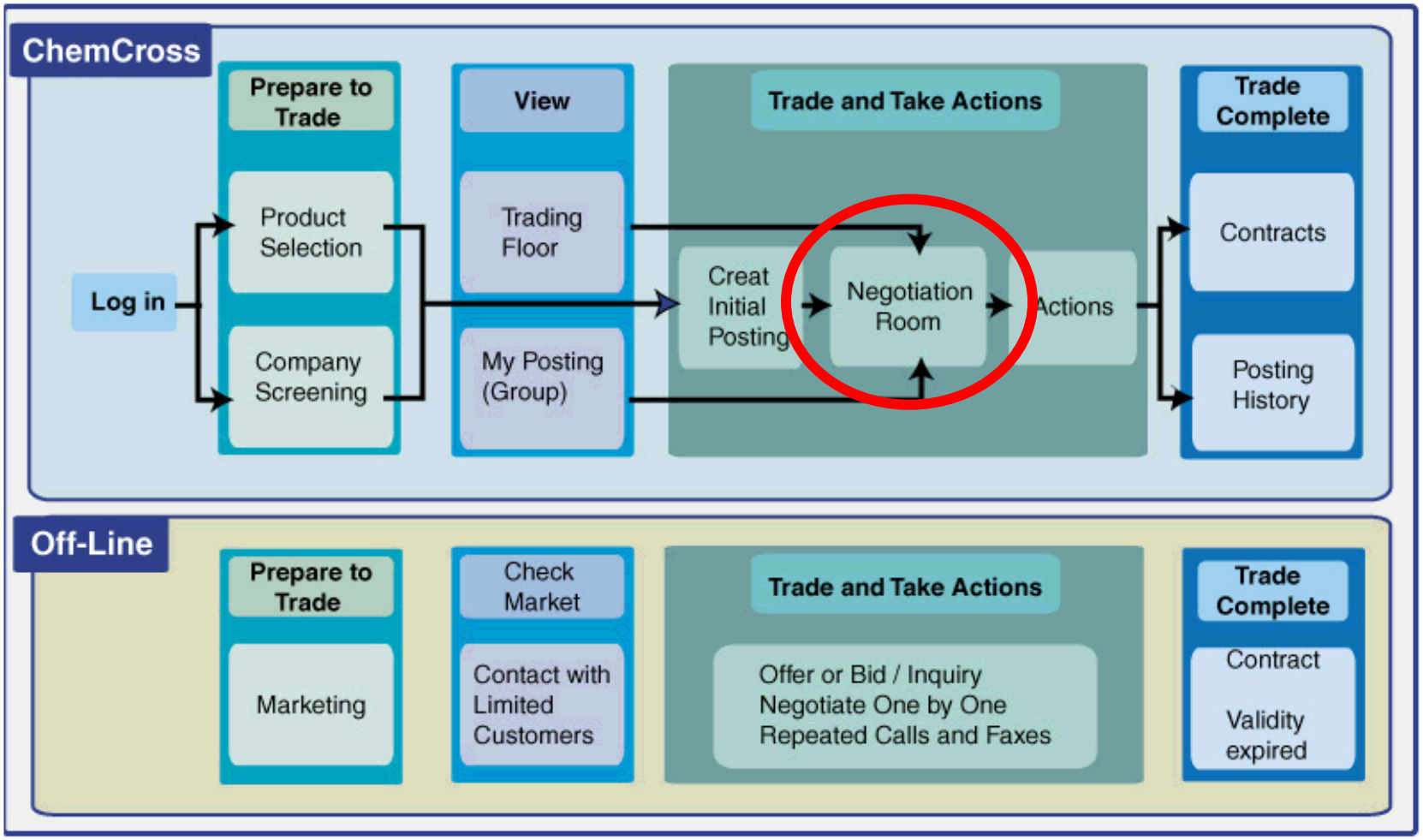


Create Initial Posting



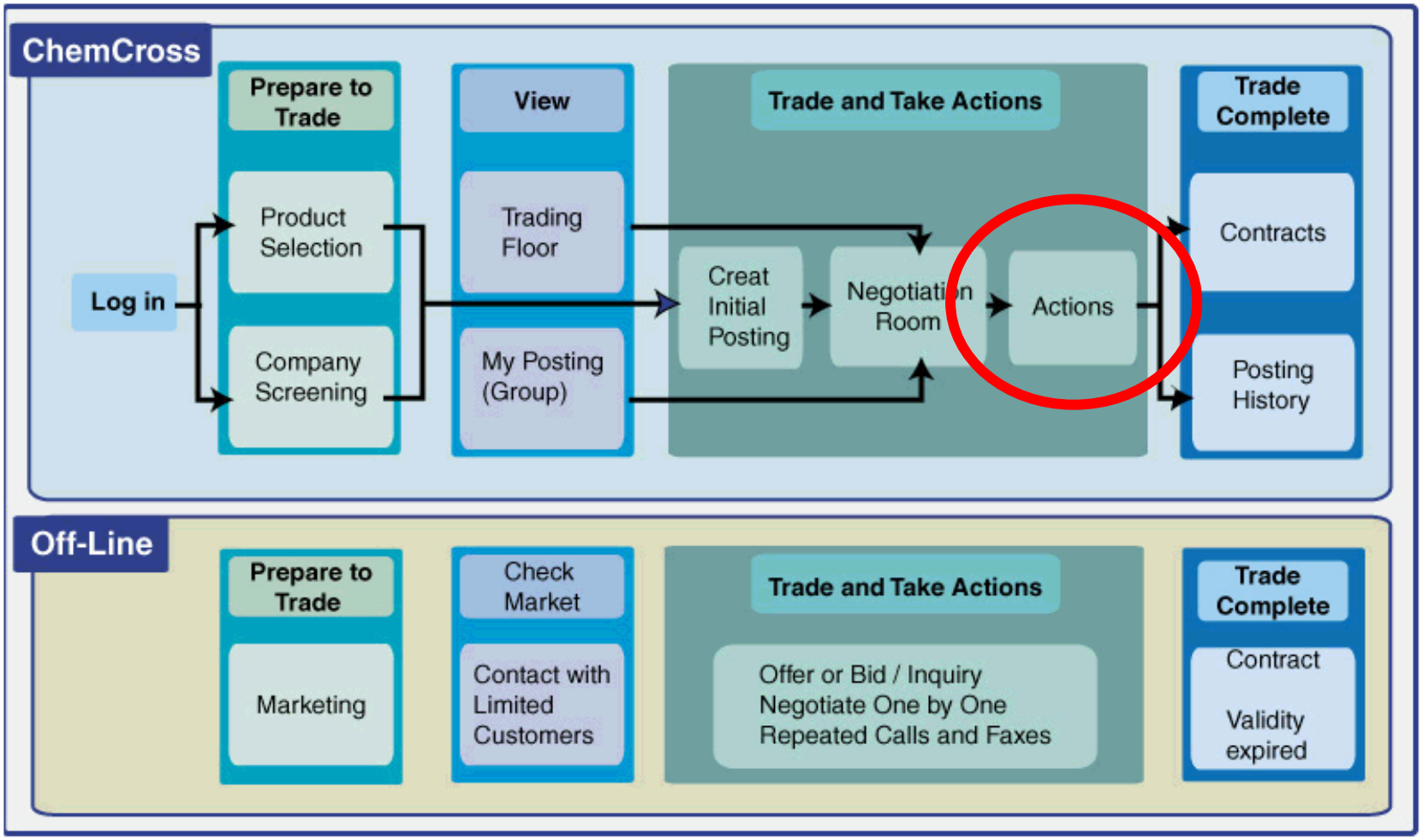
Posting Group Setting

MDF Exchange Business Flow



Negotiation Room

MDF Exchange Business Flow



Action (Mine)

ChemCross.com

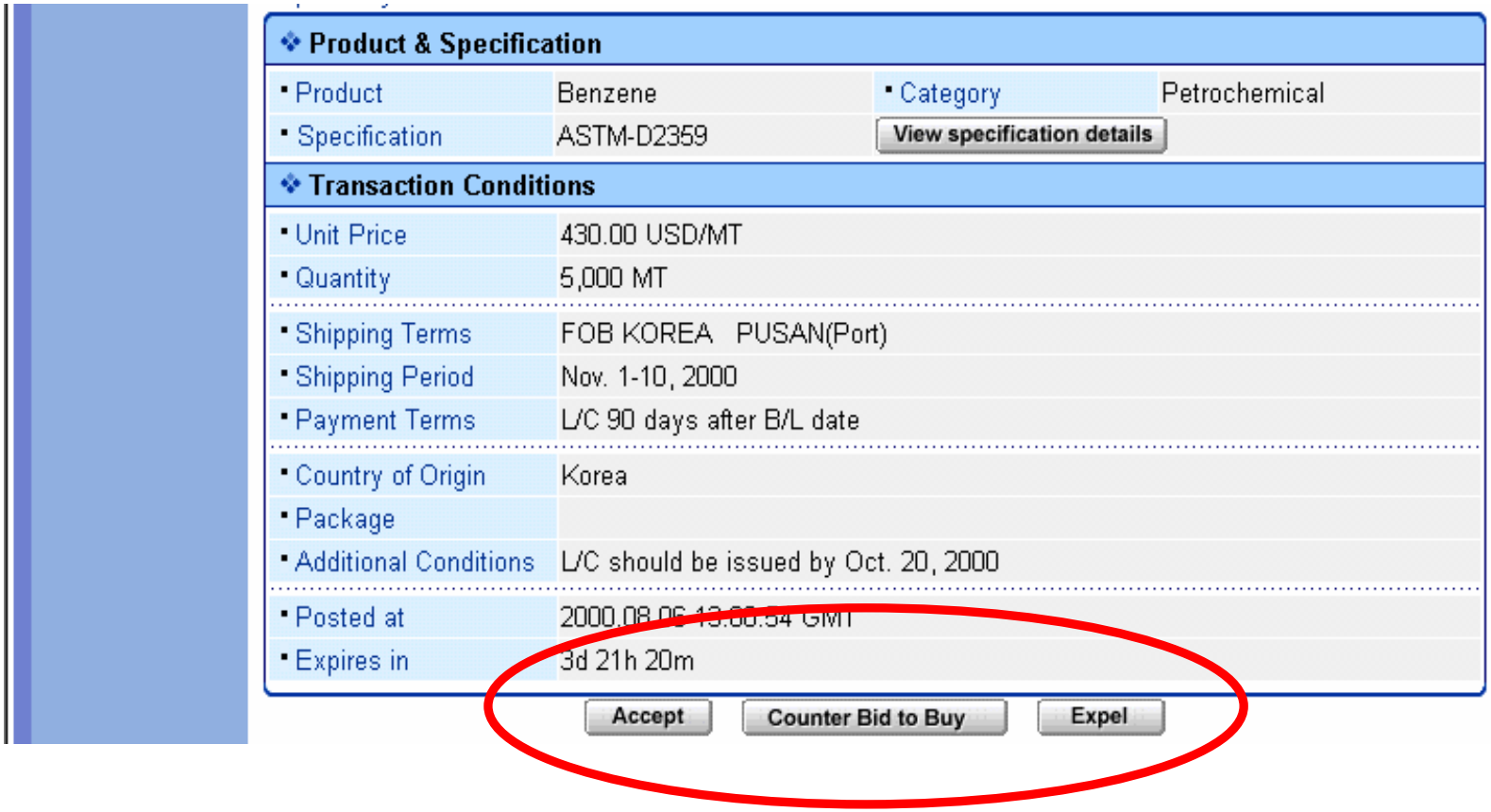
If you wish to modify or withdraw the following posting,**Press Amend** or **Withdraw**, respectively.

❖ Product & Specification			
▪ Product	Benzene	▪ Category	Petrochemical
▪ Specification	ASTM-D2359	View specification details	
❖ Transaction Conditions			
▪ Unit Price	430.00 USD/MT		
▪ Quantity	5,000 MT		
▪ Shipping Terms	FOB KOREA PUSAN(Port)		
▪ Shipping Period	Nov. 1-10, 2000		
▪ Payment Terms	L/C 90 days after B/L date		
▪ Country of Origin	Korea		
▪ Package			
▪ Additional Conditions	L/C should be issued by Oct. 20, 2000		
▪ Posted at	2000.08.06 13:00:54 GMT		
▪ Expires in	3d 21h 20m		

Amend Withraw

Action (Others)

ChemCross.com



Product & Specification

• Product	Benzene	• Category	Petrochemical
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Transaction Conditions

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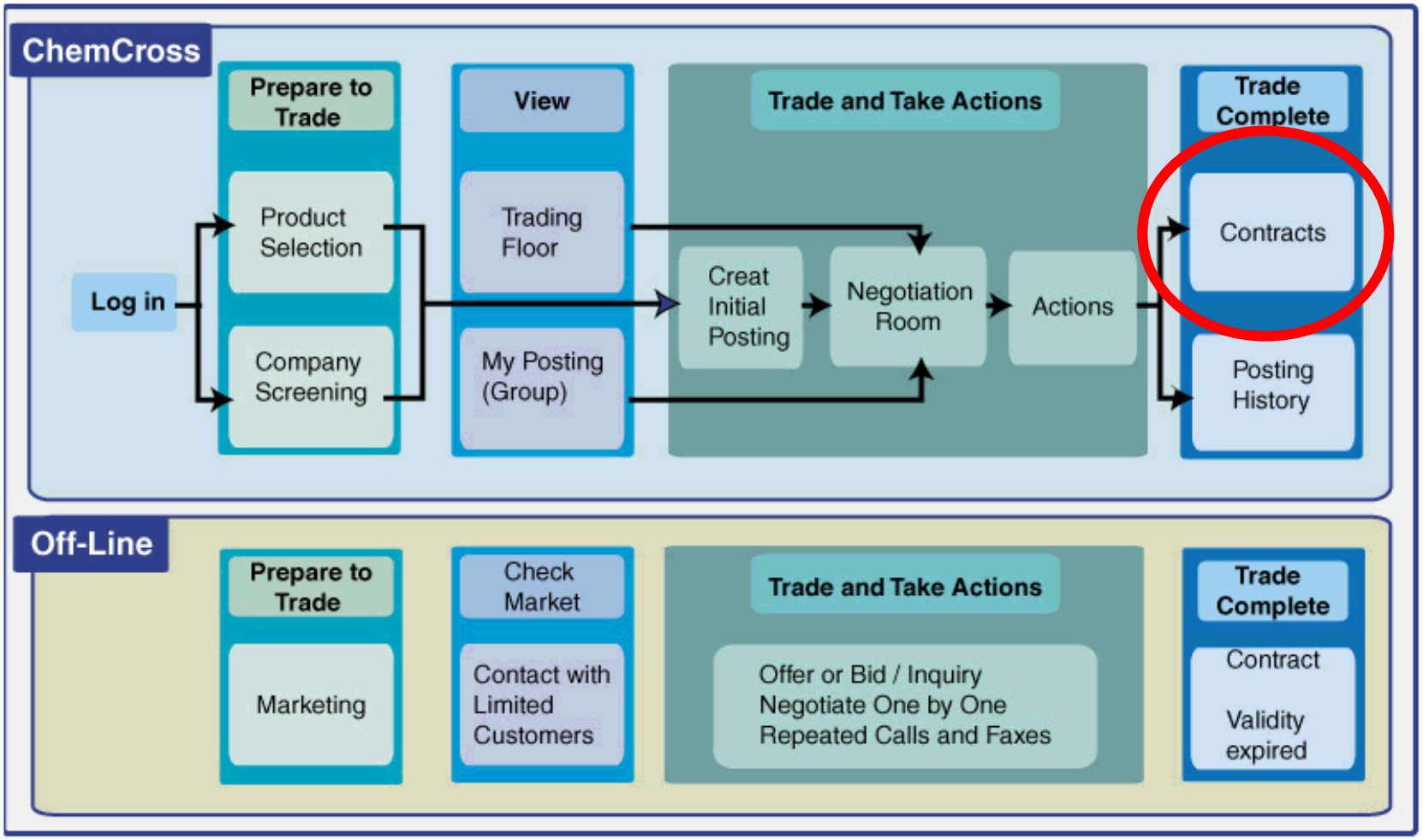
• Expires in	3d 21h 20m

Accept | Counter Bid to Buy | Expel

MDF Exchange Business Flow



Contracts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Benzene
KumHo
2,000mt
2000.03.01
S
MTBE
Dupon
80,000gal
2000.02.24
-
S
MTBE
3M
50,000gal
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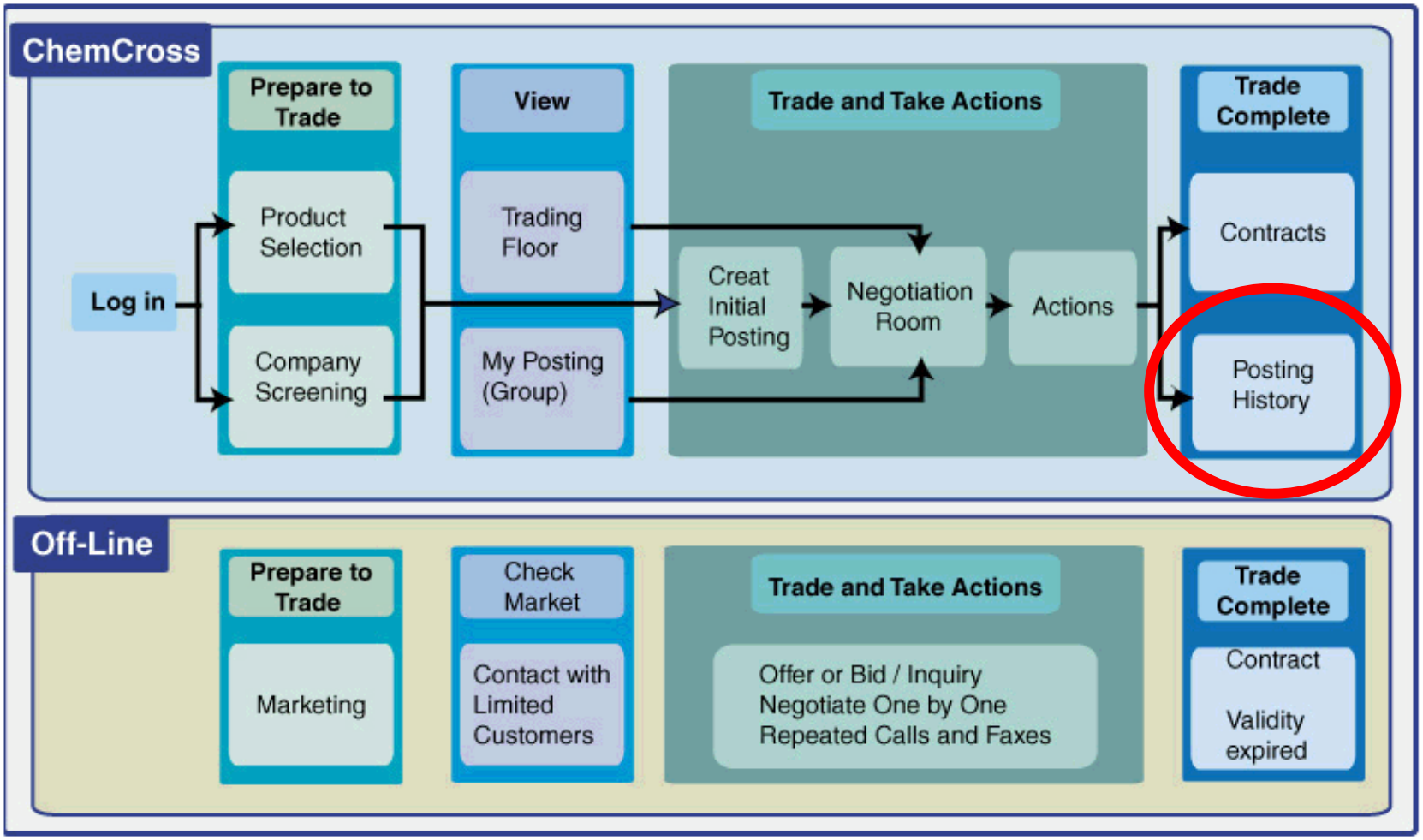
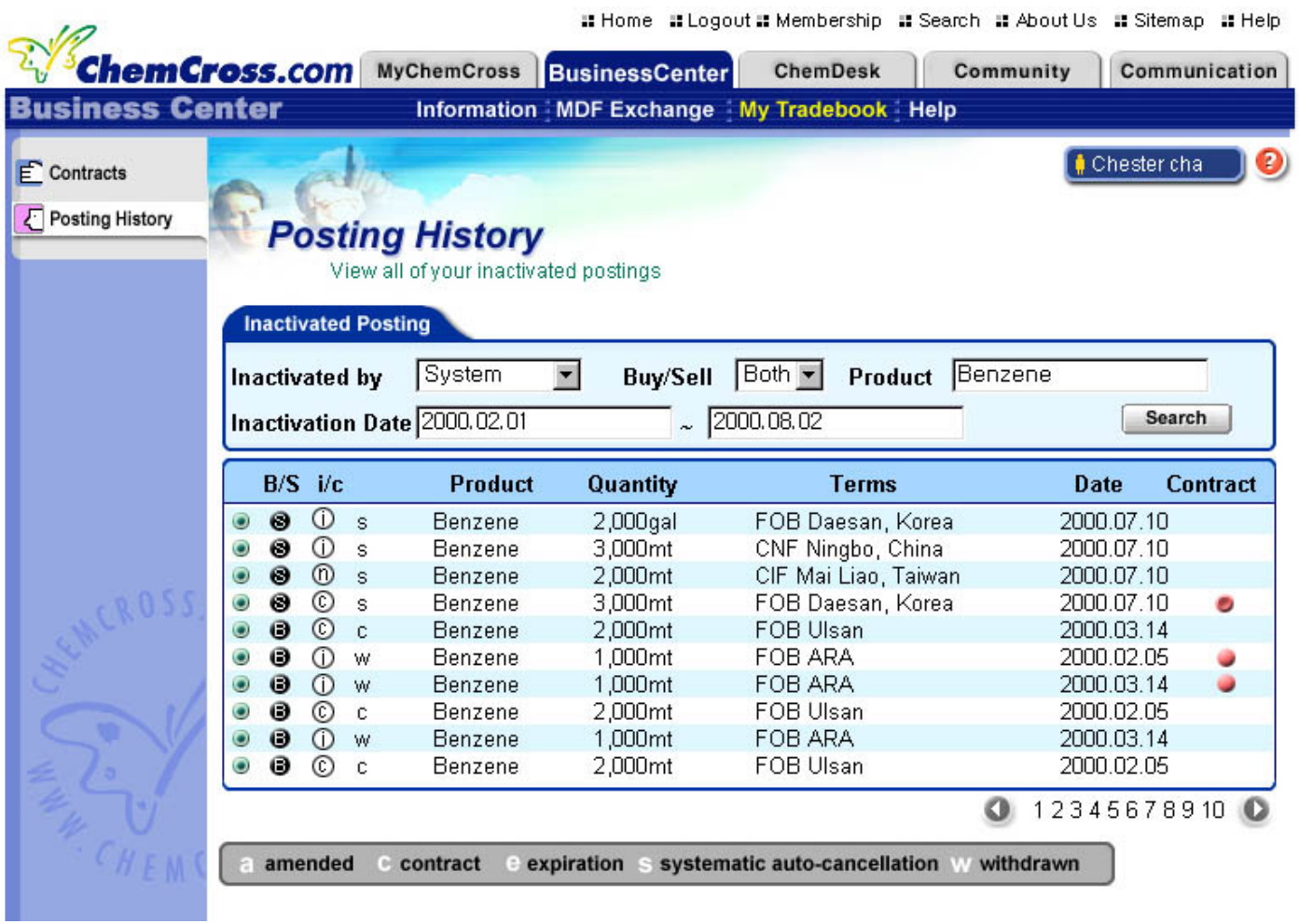
MTBE
Hyundai
90,000gal
2000.06.04
-
1 2 3 4 5 6 7 8 9 1 0

MDF Exchange Business Flow

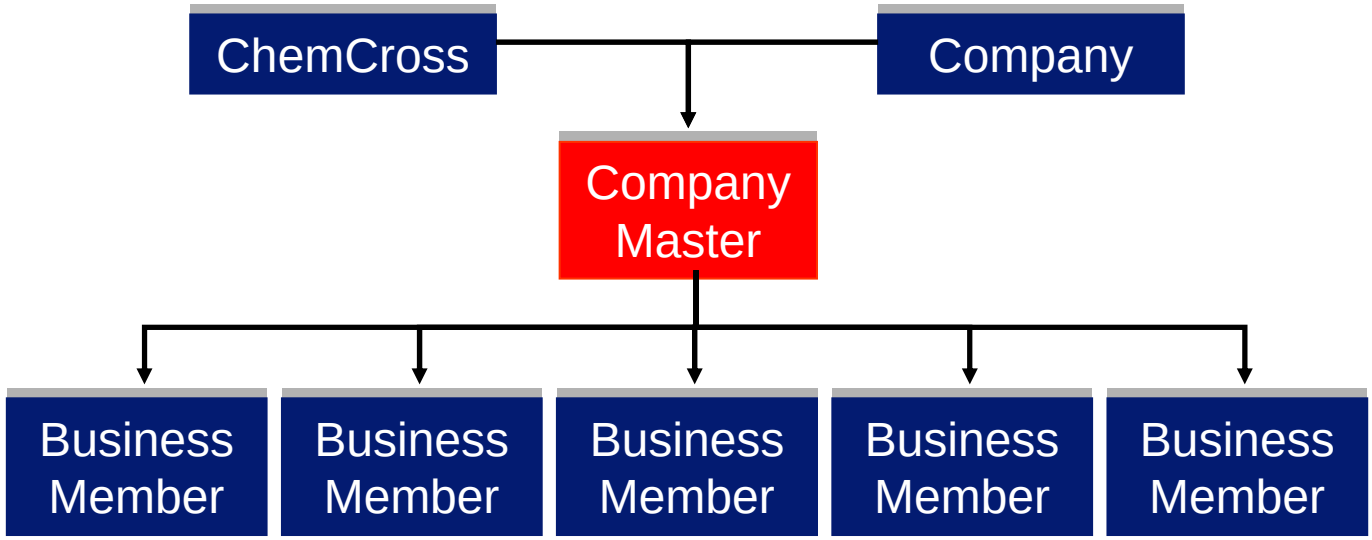


Posting History



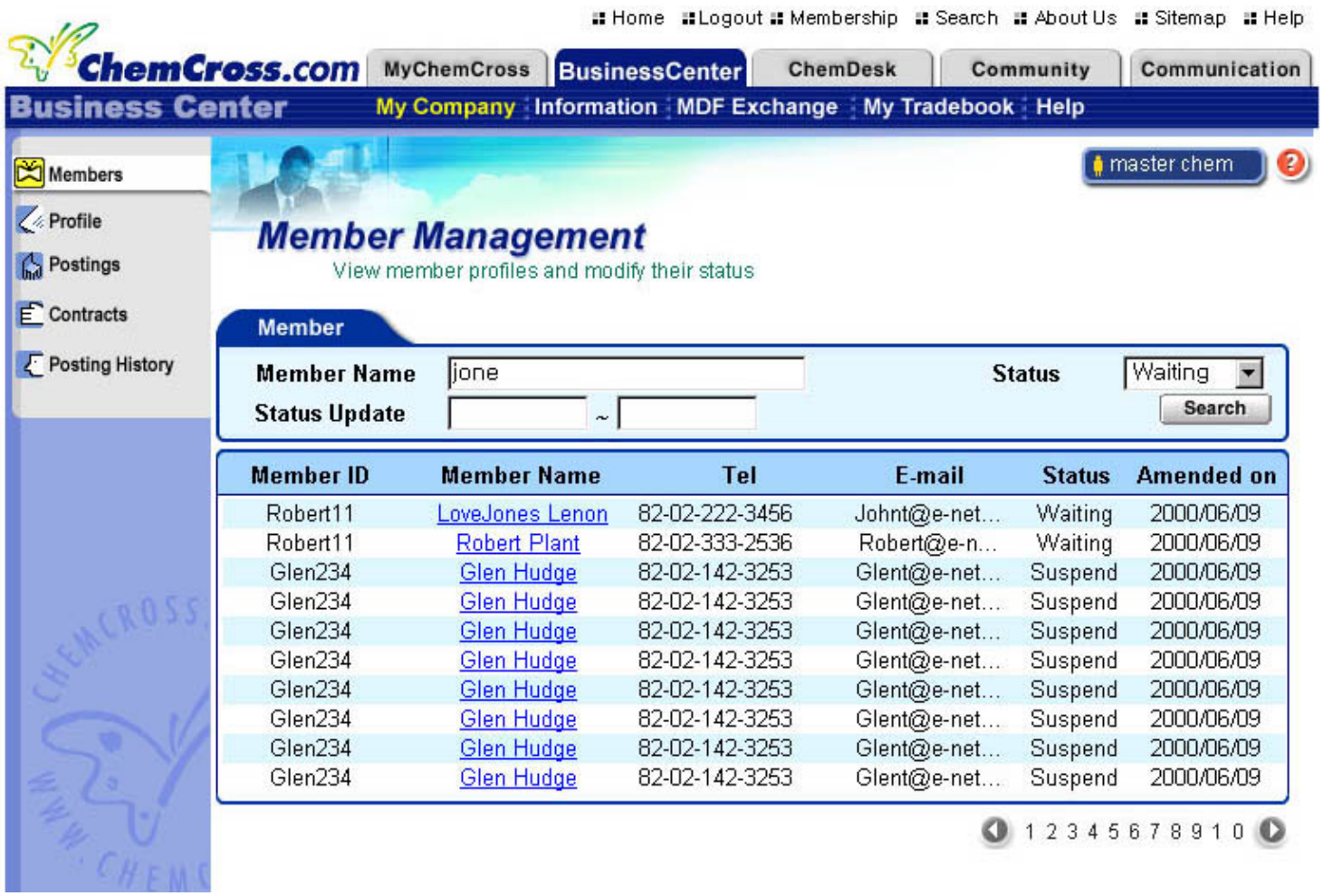
Company Master

ChemCross Member Hierarchy



- ***Membership Approval / Suspension***
- ***View Members' Postings / Contracts***

Member Management



View All Active Postings

View all Active Postings of Company Members

Key Features of ChemCross

- ***Improved Transaction Efficiency***
- ***Reliable Trading Partners***
- ***Enhanced User Interface***

Improved Transaction Efficiency

- ***MDF Negotiation***

  (Grouping and Auto Cancellation)

- ***Real-Time Notification Service***

  (E-mail, Business Facilitator)

- ***Core Time***

  (ex, 10:00 - 12:00, 16:00 - 18:00 Singapore Time)

Reliable Trading Partners

ChemCross.com

- ***Users approved by Company Master***
- ***Product-specific Partner Selection***
- ***Company Screened by each User***

Enhanced User Interface

- ***One-Click Search and View***

  (View by Trading Product, Interested Product)

- ***Efficient and Convenient Screening***

  (Check for recently added registered Companies)

- ***Easy Initial Posting***

  (Create New Posting by Modification)

Appendix 3. Major Competitors

Chematch.com
&
Chemconnect.com

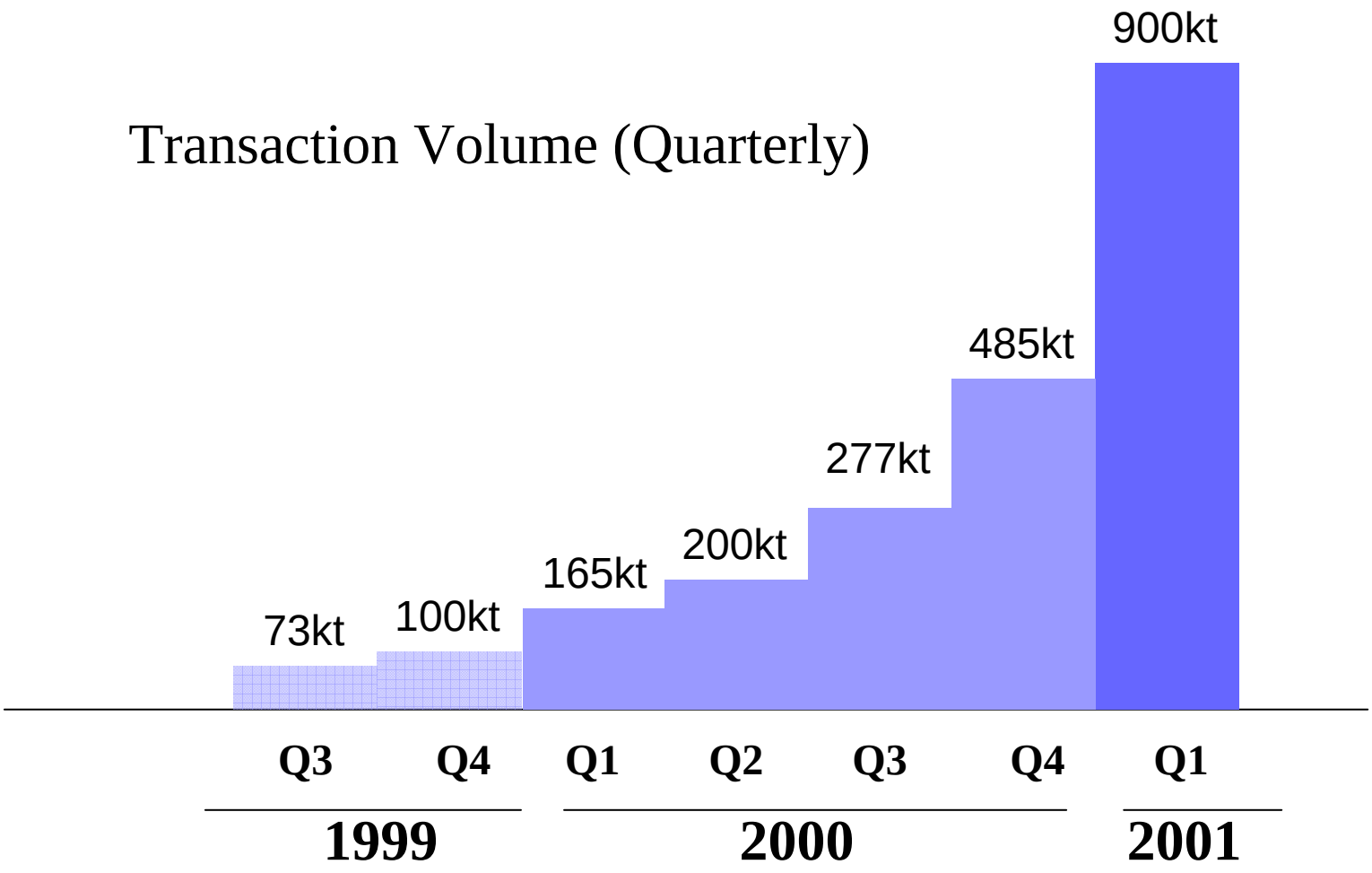
Industry Benchmarks:

Chematch Growth Track

Chematch Benchmarks

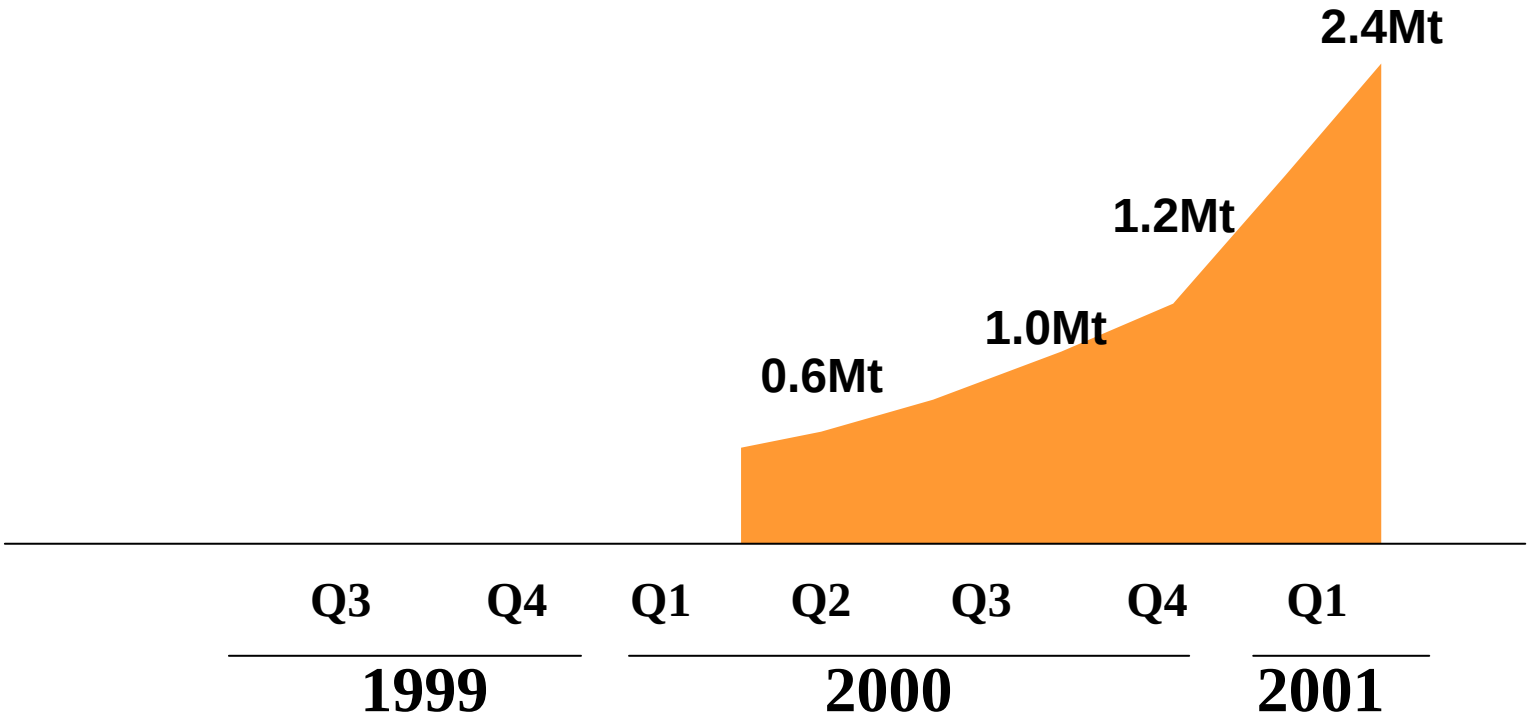
- Average transaction value per deal: $500,000
- Average price: $250/metric ton
- Average volume per deal: 2,000 metric ton
- Total number of members: 750
- Reached $100M mark (cumulative) in Q1 2000.
- Reached 1M ton mark (cumulative) in Q3 2000.
- Growth rate: 85% (Q4 2000 → Q1 2001)
- Applied for IPO in Mar 2000, withdrew in Oct 2000.

Chematch Growth Track

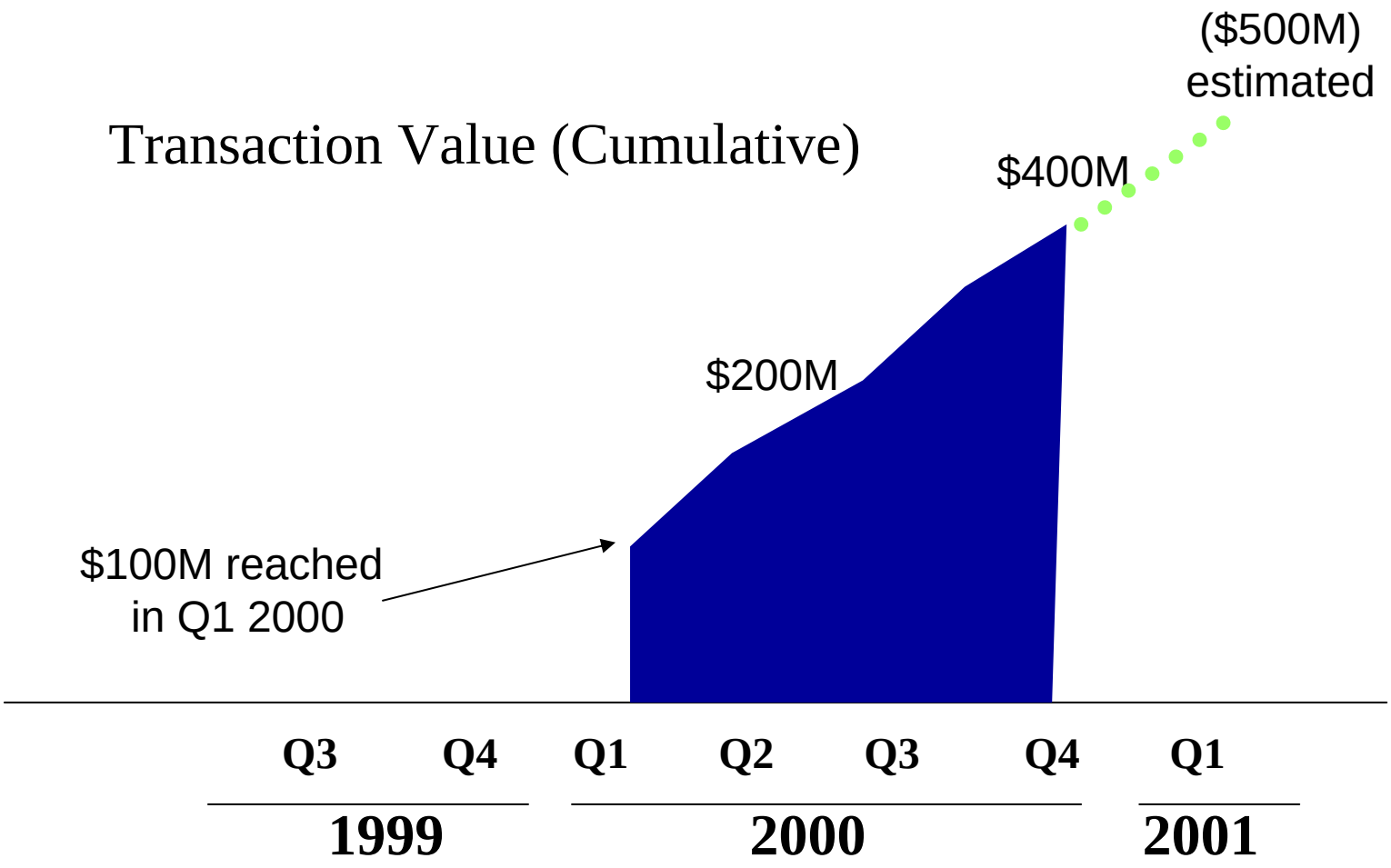


Chematch Growth Track

Transaction Volume (Cumulative)



Chematch Growth Track



notes

- The data was collected from various press release and industry news sources.
- The data may contain approximations, exaggerations, and estimations.

Industry Benchmarks:

ChemConnect Growth Track

ChemConnect Benchmarks

- Average transaction value per deal: $1.25M
- Total number of members: 12,000
- Percentage of active members: 13% (975)
- Commodities Floor transaction volume in Q1 2001: $600M
- Transaction growth rate: 33% (Q4 2000 → Q1 2001)
- ChemConnect acquired UCB (broker) in Oct 2000.
- Commodities Floor was introduced in Q4 2000.
- Applied for IPO in Apr 2000, withdrew in Jul 2000.