

Seagate Technology International (A) – enhancing supply chain collaboration

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**SEAGATE TECHNOLOGY INTERNATIONAL :
ENHANCING SUPPLY CHAIN COLLABORATION (A)**Publication No: ABCC-2001-007A
Print copy version: 23 Nov 2001*Tang Hung Kei and Tom Gleave*

In the mid-1990's, companies began to embrace the Internet with increasing interest in efforts to improve communications and achieve greater process efficiencies. By the late 1990's, an explosion of related activity had taken place as established companies and upstart entrepreneurs rolled out a variety of new online business models designed around the Internet. Institutional and retail investors supported many of these ventures with great zeal, in turn creating vibrant capital markets and previously unseen share price valuations. During this period, Seagate Technologies International (Seagate), the world's largest disc drive manufacturer, had become very focused on improving its supply chain management (SCM) practices, which it viewed as a key element in its competitive strategy. As part of its commitment to remain on the leading edge of SCM, Seagate, along with nine other electronics and high technology industry leaders invested in e2open.com, an online business-to-business marketplace that offered greater potential collaboration among industry players. However, by the time the portal was launched in August 2000, investors and customers had become very wary of many new online business models. By April 2001, this skepticism had turned into significant doubts over which models (including e2open) would be successful or not in the years ahead. This left two key Singapore-based Seagate managers involved in the e2open project, Y.C. Goh (Executive Director - Asia Materials) and C.P. Teh (Senior Director - e-Business), with the task of drafting recommendations about how the new online venture could attract more interest and participation from other industry members. The respective materials management and e-business professionals knew that the task would not be easy because e2open had yet to secure any revenue-generating contracts from among the company's founders or any other industry players.

Ivey-Nanyang Case Writer Tom Gleave prepared this case under the supervision of Associate Professor Tang Hung Kei. The case is based on public sources and interviews with key personnel from Seagate Technology International. As the case is not intended to illustrate either effective or ineffective practices or policies, the information presented reflects the authors' interpretation of events and serves merely to provide opportunities for class discussion.

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SEAGATE BACKGROUND

Seagate was the world's first independent disc drive manufacturer, having established operations in Scotts Valley, California in 1979. Since then, the company had grown to become a world leader in the design and manufacture of various digital storage related products. This growth was generated internally by developing and embracing new technologies, as well as through acquisitions, the most notable of which was the 1996 merger with Conner Peripherals, a move that vaulted Seagate into its lead position worldwide. The company's products fell into three main categories:

- *Disc Drives* were digital storage devices that ranged in capacity from 10 gigabytes to 180 gigabytes. The larger capacity devices were used in the manufacture of PCs and workstations, while the smaller capacity items were used mainly in notebook computers. The company was the market leader in each drive segment in which it competed.
- *Recording Heads & Media* were magnetic read and write heads used in disc drives and tape drives. Seagate was the largest volume supplier of magnetic recording heads and disc media in the world, much of which was used internally as inputs for its own manufacturing needs.
- *Internet Solutions*, the company's latest service offering, included the design and delivery of storage, access and information management products and services aimed at exploiting the substantial potential of the Internet. To this end, Seagate had dedicated considerable resources towards the development of applications in the emerging domain of Storage Area Networks (SANs).

Seagate viewed digital storage device manufacturing as an "extreme sport" due to the expertise required in a variety of disciplines, including aerodynamics, electronics, fluid mechanics, magnetics, physics and process technologies, among others. The company had traditionally sought to retain control over these knowledge domains, as well as ensure rapid responsiveness to new industry developments, by adopting a vertical integration strategy. However, by the late 1990's, it began to outsource some non-

core activities, which contributed significantly to a decreased permanent staff.¹ This was in keeping with rivals Quantum and Western Digital, which relied heavily on outside suppliers and contract manufacturers, although Seagate still remained comparatively more integrated. In addition to being vertically integrated, the company placed a high value on research and development, and the ability to attract and retain hotly sought-after talent. Seagate believed that its vertical integration strategy, combined with its commitment to R&D and focus on securing skilled human resources, were the key reasons why the company had been able to continuously establish new benchmarks within the industry.²

Seagate maintained 10 research and development centres throughout the world, as well as numerous manufacturing and customer service sites in the China, Indonesia, Northern Ireland, Singapore and Thailand. The latter two countries served as its principal manufacturing base, accounting for about 90 percent of the company's total production. These manufacturing centres maintained relationships with some 200 component suppliers, many of whom were based in Asia. Once complete, a high proportion of the company's finished goods were sold directly to the several of the world's leading personal computer and workstation manufacturers (who held strategic purchase agreements with Seagate), such as Dell, Hewlett Packard and IBM. The products were physically channelled through distribution hubs in California and Ohio (which serviced the Americas), Amsterdam (which covered Europe, the Middle-East and Africa), and Singapore (which serviced all of Asia). Other finished goods items were sold to specialist distributors (such as Ingram Micro) and resellers. A modest amount of finished goods were sold through the company's e-commerce Website, usually to smaller assemblers and retailers.

E-ENABLING THE SUPPLY CHAIN

The complex nature of Seagate's manufacturing process meant that the smooth flow of information was critical for achieving cost efficient operations. However, by the late 1990's, the company was showing signs that information was not being disseminated as quickly and smoothly as possible. This resulted in slower cycles times and growing inventory levels at a time when the industry was

¹ The number of employees worldwide dropped from a peak of 110,000 in 1998 to about 50,000 at the end of 2000.

² One of Seagate's most recent breakthroughs was the development of the world's high capacity (180-gigabyte) 3.5-inch disc drive, a device capable of storing information that was equivalent to a stack of typed pages three times the height of the Empire State Building.

becoming increasingly price competitive.³ Consequently, a decision was made in March 1998 to analyze and assess the company's supply chain management systems in an effort to identify and address areas for improvement. As Matt Johnen, Vice President - Materials Asia, recalled:

Back in '98, everybody was talking about 'supply chain management or SCM', but most people, including myself, didn't fully know what it meant or how we could gain competitive advantage from it. Since I had shown a strong interest in learning about SCM, the CEO [Steve Luzo] asked me to head up our exploration efforts, and to work with outside consultants in diagnosing the situation. For the next four months we analyzed the organization from top to bottom looking for ways to increase supply chain efficiency. We also used the time as an opportunity to evangelize the merits of SCM... we wanted to encourage our employees to understand and be prepared for e-enablement, because it was coming no matter what.

In July [1998] we began implementing our new SCM systems - a process that took 18 months to complete. But it was worth it. To give you an example...each day, our operations in Singapore and Indonesia receive a combined 22 million components that go into the production of printed circuit boards, which themselves are just one of the more than individual items needed to make any one of our disc drives. It used to take 15 clerks to input and track all of the relevant product information for these components. But by harnessing the power of the Internet and integrating our ERP systems with bar coding technology, we were able to dramatically condense all of this activity. Previously, 30,000 separate transactions were needed for all 22 million items, but now we combine everything into 20 bulk delivery orders. As a result of these and other initiatives, the company has been

able to reduce direct costs by 20 percent, logistics costs by 15 percent and improve average order cycle from 100 to 50 days.

In Asia, one of Seagate's key partners in its e-enablement efforts was ECnet.com, (ECnet) an independent provider of online SCM and procurement services dedicated to the electronics and high-technology industry. The company was formed in Singapore in 1995, and had since grown to become one of Asia's leading online SCM service providers.⁴ ECnet served over 1500 trading partners, including industry leaders Hewlett-Packard, NatSteel Electronics, Matsushita, Sharp and Toshiba. In aggregate, its trading partners conducted over US\$1 billion in transaction values each month. ECnet was privately held and financed by some of the world's leading asset management companies, including 3i, Goldman Sachs, Morgan Stanley, as well as Singapore-based GIC Special Investments Pte. Ltd., a government-backed investment management company, venture capitalist SilkRoute Holdings and Flextronics International Limited, the world's second largest contract manufacturer after Soletron. These investors had cumulatively provided over US\$58.5 million over four rounds of financing between 1997 and 2000. Revenues for the year-end 2000 were approximately US\$10 million, with the first year of profitability expected in 2002.⁵

ECnet offered three subscription services that were delivered via the Internet: an order management suite; an inventory management suite; and an open exchange trading platform. As part of its e-enablement initiatives, Seagate adopted ECnet's order management and inventory management suites in 1998. The order management suite was adopted based largely on its ability to integrate all shipping-related information and communications between trading partners. The inventory management suite was adopted based on its ability to facilitate the smooth exchange of forecast information across the supply chain. In addition, the suite's "vendor-managed inventory" (VMI) feature helped Seagate manage its inventory, while ensuring that the right goods were available when needed. The fees charged for its subscription-based services ranged from US\$5,000 to US\$10,000 per month. ECnet's services were well-regarded by the Internet industry in Asia, as evidenced by the two awards

³ The average disk drive price per megabyte dropped from US\$80.78 in 1982 to US\$0.043 in 1998. Source: From Silicon Valley to Singapore: Location and Competitive Advantage. Doner, R.F., Haggard, S., McHendrik D.G. Stanford University Press

⁴ "In May 2000, the company moved its headquarters from Singapore to Mountainview, Ca.

⁵ ECnet adds on services to stay on top. *Business Times*, 27 November, 2000.

the company received in March 2000.⁶ Seagate was also satisfied with ECnet, prompting Rich Becks (Seagate's Vice President of e-Business Development and Collaboration) to state: "ECnet promised results and delivered. ECnet VMI has helped us implement a business model that improves our inventory turns by 3-4X."⁷ (See **Exhibit 1 - Overview of Seagate's Supply Chain.**)

THE RISE OF ONLINE B2B

At the same time that Seagate's SCM improvement initiatives were being implemented, various forms of Internet-enabled commerce were rapidly taken hold throughout the world. This led to a proliferation of online trading platforms (or portals) engaged in consumer-to-consumer (C2C), business-to-consumer (B2C) and business-to-business (B2B) commercial activities. One of the industries with the greatest amount of activity was the electronics and high technology industry. This was because the industry was comprised of a complex web of thousands of manufacturers, suppliers, distributors and brokers who had to deal with fickle demand patterns. This, in turn, often resulted in significant supply shortages or surpluses. Therefore, given the opportunity for improved efficiencies afforded by the Internet, over 50 industry-related online B2B marketplaces had been established in recent years, most of which were involved mainly in the trading of components and finished goods.

In 2000, Seagate began to seriously investigate developments in the B2B portal space and concluded that a strong trend across numerous industries had surfaced indicating that many leading industry players were beginning to participate in so-called industry sponsored marketplaces. Seagate was intrigued by these portals because greater collaboration among industry participants, particularly in the product design phase, offered the potential for dramatic reductions in time to market and product development costs. Consequently, Seagate decided to become one of 10 founding members of e2open.com, a high-technology industry sponsored marketplace launched in August 2000.

By the end of 2000, the estimated number of online B2B exchanges that had been established in recent years ranged from 800 and 1000. Forrester Research, a high technology research and consulting company, claimed that the amount of commerce channeled through these exchanges during 2000 was US\$604 billion, with Asia accounting for US\$50 billion. By 2004, this activity was expected to reach US\$6.3 trillion worldwide, US\$1.5 trillion of which was expected to originate in Asia.⁸ Despite such enormous growth projections, however, most industry analysts expected to see substantial industry rationalization over the next several years, as less visible and illiquid firms failed to develop sufficient client bases. This trend led Forrester Research to predict that, of the more than 50 electronics and high technology related B2Bs operating at the end of 2000, only nine would be left by 2004.⁹

PREVAILING B2B MODELS

The various online B2B models that had been established in recent years generally fell within one of five categories.¹⁰ The most common was a buyer-centric marketplace in which many suppliers focused on satisfying the requirements of a single large, industry leading company, such as Intel or Wal-Mart. In these relationships, the buyers exerted considerable power over the suppliers by forcing them to compete vigorously on price and time-to-market. At the opposite end of the spectrum were supplier-centric marketplaces consisting of single large manufacturers serving many buyers, as was the case with Dell Computers and Cisco Systems. In these instances, the suppliers exerted considerable power over the buyers. For example, both Dell and Cisco forced their customers to purchase most of their respective products online which, in turn, yielded considerable savings for the two suppliers. To date, these electronic marketplaces accounted for over 90 percent of all B2B e-commerce activity. This pervasiveness was largely due to the fact that these portals were essentially extensions of existing relationships, with the primary focus on managing costs instead of earning revenues. Moreover, these trading platforms

⁶ The two awards, Best B2B Internet Site and Internet Company of the Year, were conferred by Internet World Asia.

⁷ Ecnet.com homepage

⁸ *The B2B Market in Asia*. 12 January, 2001. emarketer.com

⁹ *Electric Shock*, 18 September, 2000. Informationweek.com Information on the five B2B models and their associated success factors was adapted from a presentation given by Merle

¹⁰ Hinrichs (Chairman and CEO of Global Sources Limited), at the B2B E-Commerce Asia Pacific Forum held in December 2000 in Hong Kong.

were inherently less complex to operate and understand than the other electronic B2B models that had since emerged.

The evolution of information technology had led to the creation of increasingly sophisticated B2B marketplaces, such as independent marketplaces, distribution portals and industry sponsored marketplaces. The independent marketplaces typically provided a wide range of content related to a wide range of vertical industries, as well as platforms for developing and facilitating trading relationships. These players had the potential to generate multiple revenue streams through advertising supplier products, hosting suppliers websites (which acted as electronic storefronts), delivering timely industry information, and facilitating transactions between buyers with sellers. A key difference between these B2B models and the others was that revenue structures were usually designed to ensure neutrality by not favouring either the buy or sell side in any transaction. VerticalNet was often seen as the most visible independent B2B portal in the world, with the NASDAQ-listed company offering buyers and sellers in 59 vertical industries an opportunity to source products and conduct trade. Hybrids, like ECnet, offered similar services, albeit with a narrower industry focus.

Distribution portals acted as online brokerages by channeling goods from several large suppliers to many buyers. In these arrangements, the balance of power leaned toward the suppliers since they usually held commanding positions in their respective industries. An example of this type of model was Ingram Micro, the global computer and related peripherals distributor. Ingram Micro typically bought computers, components and related accessories from likes of Hewlett Packard, IBM, Compaq and Seagate, which it then sold to various upstream assemblers, distributors and retailers. The revenues that Ingram Micro earned came from mark ups on the prices charged to the buyers. By contrast, *industry sponsored marketplaces (ISMs)* consisted of several large like industry players that had come together online to exploit opportunities for improved product design, SCM collaboration and increased purchase economies. The most visible example of this model was Covisint.com, an *ISM* established in February 2000 by the "Big Three" automobile manufacturers in the US. The launch of Covisint.com was widely seen as the birth of the *ISM* model.

Given the level of saturation and impending consolidation or bankruptcy of many online B2B players, five key factors were deemed essential for the future success of the existing portals. These factors were:

- Visibility - referred to the ability to gain and sustain exposure and appeal with existing and potential investors.
- Liquidity - concerned the need to build a critical mass of active buyers and sellers who could collaborate and transact with each other.
- Scope - referred to the ability to offer appropriate domain and technical expertise to ensure the provision of services deemed suitable to the market.
- Scale - dealt with the ability to sustain and extend service offerings to larger trading communities within a distributed Internet environment.
- Profitability - concerned the desire for investors and customers to work with proven models in the face of skepticism over online B2B ventures.

e2open.com

e2open.com (e2open) was an centered around a common base of global players from the computer, telecom equipment and consumer electronics industries. The California-based company was launched in August 2000 by 10 of the electronics and high technology industry's leaders, namely Acer, Hitachi, IBM, LG Electronics, Lucent Technologies, Nortel Networks, Panasonic, Solectron, Toshiba and Seagate. As was the case in other industries, the motivation for developing the ISM came from the recognition that the Internet provided companies with an opportunity to achieve greatly improved operating efficiencies. At the same time, the resources required to adequately harness the power of the Internet across an entire industry were considerable.¹¹ This led the consortium of interests to pool their resources and talents in an effort to create an independent start-up company that would provide a platform for design and SCM collaboration and procurement. The 10 founding partners cumulatively pooled US\$100 million in capital to fund the project. An additional US\$80 million in funding was secured from Crosspoint Ventures and Morgan Stanley Dean Witter, both of whom served

¹¹ The cost to develop a single private network with a limited number of industry participants for a Fortune 500 company was estimated to be between US\$50 and US\$100 million. Source: The Cost of B2B Marketplaces, eMarketer.com

as business advisors to the start-up, along with McKinsey & Company. E2open planned to secure additional financing from other potential partners, as well as raise money on the public markets. The founding partners strongly believed that public ownership was essential for attracting top management talent, as well as ensuring that neutral treatment among all participants was maintained. However, given the strong negative sentiment that was prevailing in financial markets towards Internet-related companies, management postponed any initial public offering until 2002. This time period corresponded with the anticipated conclusion of the start-up phase of *Open Markets*, the first service line (among three) that e2open initially expected to fully develop.

e2open's founders were committed to developing an infrastructure that would facilitate the creation of a so-called "frictionless" supply chain. To this end, the company sought to offer an electronic environment where industry participants could access the following three main service lines:

- *Design Collaboration* - would allow dispersed teams of engineers to collaborate on projects across departments, divisions, partners, suppliers and manufacturers, in the quest for achieving faster product development cycles and reduce manufacturing costs.
- *Supply Chain Services* - would support manufacturing processes by providing participants with an opportunity to achieve greater efficiency in inventory management, procurement, capacity forecasting and planning, and logistics.
- *Open Markets* - provided a marketplace designed to increase liquidity in spot and surplus markets, enable buyers to fulfill unplanned needs for materials and provide sellers with an opportunity to find new distribution channels. These activities would be facilitated through auctioning, spot purchasing, contract sourcing, and bid-ask commodity exchanges.

In developing its platform, e2open used open technologies that incorporated various state-of-the-art applications from several leading technology partners. Matrix One provided design collaboration software applications, while Tivoli Systems (an IBM subsidiary) provided the security and encryption services required by the platform. Two of the highest profile B2B Internet players to have emerged in

recent years, Ariba and i2.com, provided software solutions that supported the *ISM's* supply chain service offerings. In an effort to bolster its service offerings, e2open had also inked a deal with PartMiner, an online catalog that specialized in stocking hard to find electronic parts. e2open was expected to channel orders for parts that members could not find within its *Open Market* service to PartMiner, which would then act as a broker and charge buyers a premium for the scarce parts. The deal was not exclusive, as Partminer had also established relationships with Dell Computers and contract manufacturer Celestica, among others.

e2open's technology platform was designed to support all industry information system standards by allowing for simplified integration into various enterprise-wide resource planning [ERP] systems. After rolling out its prototype in the US in late 2000, the company began to roll out localized hubs in Europe and Asia modeled on the US version. While the underlying architecture of the European and Asian hubs remained identical to that of the US platform, the user interfaces were localized to accommodate unique business preferences and language differences. The Asia-based hubs were expected to service leading industry players operating in Japan, Korea, Taiwan and Singapore. To assist in their development, the founding companies allowed some of their employees to be seconded to the e2open project. At the same time, certain founders assumed responsibility for the development of specific hubs. For example, Acer was responsible developing the Taiwanese hub, LG Electronics oversaw development of the Korean hub, IBM managed the Japanese hub and IBM and Solectron had joined to lead development of the Singapore hub.

By April 2001, e2open had grown to over 100 fulltime employees worldwide, with an additional 80 virtual employees seconded from the company's founders and technology partners. Many of these employees had been, or were engaged in, various test projects involving selected founders. Five test projects had been, or were being conducted using the *Design Collaboration service*, while three others (with one involving Seagate) had been or were underway using the *Supply Chain Services*. The Open Market service had also been running weekly auctions involving a limited number of invited participants. The test involving one of the three companies piloting *Supply Chain Services* involved 20 suppliers and to date, appeared encouraging. As Mark Holman, e2open's CEO, suggested:¹²

12 One-on-One: e2open hopes to be industry's SC hub. 3 March, 2001. www.ebnews.com

If the pilot works and does what the expects, they want us to then connect 13,000 of their suppliers. If we do that with even half of the founding companies, we're probably connected to 60 percent of the electronics industry. My estimate of what we've represented in our founding base is a total of somewhere between 50,000 and 80,000 suppliers.

Based on the success of the various pilot tests, e2open launched a Strategic Member program in mid April 2001 to encourage broader industry participation. The program offered participants early access to e2open's products and services, as well as an opportunity to join the company's Advisory Council, which was a forum used to discuss and influence the development of the *ISM*. Coinciding with the launch of the new program, e2open announced that four large Japanese electronics industry players (Omron, Ricoh, Sanyo and Sharp) had become the company's first Strategic Members. At the same time, however, none of the new Strategic Members had made any concrete commitments to use any of e2open's three service lines. This meant that e2open had yet to generate any revenue directly from the provision of its three main service lines.

VALUE PROPOSITION

e2open believed it provided stakeholders with a wide range of benefits made possible through the potential for collaboration among a diverse pool of industry players, as well as through the standardization of business processes. For example, original equipment manufacturers (OEMs) were expected to realize reductions of several key cost elements, most notably infrastructure, transaction and inventory costs. In addition, the platform was expected to provide OEMs with increased sourcing options, as well as controls over unauthorized buying activity. Suppliers were expected to realize lower customer acquisition costs, increased and direct access to global trading partners, an enhanced ability to service smaller customers, as well as reduced transaction processing costs and credit and financing costs. Moreover, suppliers did not have to make duplicate investments to interact with multiple customers. Intermediaries, such as third-party logistics service providers were expected to enjoy increased supply chain visibility and integration with suppliers and customers, improved inventory and production management, increased involvement in design processes and low-cost

access to global markets. Other value-added services being considered but not yet available included offering supplier reliability ratings, as well as alerting community about surplus or shortages of capacity. (See **Exhibit 2** - Overview of e2open's Services.)

REVENUE MODEL

The revenue that e2open was hoping to generate was expected to come from three different streams: membership fees, subscription fees and transaction fees. Membership fees would be levied when a supplier wished to join the *ISM*. These fees would include any necessary customization and development costs required by the new member. Annual fees would also be charged based on the number of licensed "seats" subscribed as well as the types services required. For those companies requiring access to a broader range of design collaboration or supply chain service features, higher fees could be expected, while those who needed only select functions could expect to pay less per seat. e2open had yet to establish formal fee schedules for its design collaboration and supply chain service offerings because not all areas were yet fully functional. Given the company's belief in the need for flexible pricing to take into account the unique needs of each user, as well as the intensity of their usage, e2open had yet to establish any formal and fixed fee schedules for the collaboration intensive services.

For community members using the *Open Markets* service, transaction fees of 3 to 5 percent were expected, depending on the specific type of transaction. These fees were structured to take into account revenue sharing agreements reached with the company's key technology partners. For open auction transactions, a minimum fee would be charged regardless of the outcome of the auction. If an auction was a success, a closing fee would also be charged. In the case of high value auctions (e.g. US\$10 million or more), a flat fee was anticipated because the cost of facilitating such orders would not be appreciably different than for much smaller orders.

A DIRECT COMPETITOR

Converge, Inc. operated Converge.com, an *ISM* targeted at high-technology industry buyers and sellers who were interested in collaborating and transacting with each another. The portal was established in June 2000 (originally under the name

eHitex.com) by 13 global high technology leaders: Advanced Micro Devices, Agilent Technologies, Canon, Compaq, Gateway, Hitachi, Hewlett Packard, Maxtor, NEC, Samsung, SCl Systems, Solectron, Synnex, Tatung and Western Digital. Collectively, these companies contributed US\$100 million in initial financing to create the independent company. The founders also recruited several high profile consulting and finance companies to act as advisers, including Cap Gemini Ernst & Young, Chase Manhattan Bank, Deloitte & Touche Consulting, Goldman Sachs and PricewaterhouseCoopers, among others. The services offered by the *ISM* fell into four main categories, which were as follows:

- *ConvergeTrade* - would allow buyers and suppliers to liquidate excess inventory and fill urgent order requests.
- *ConvergeKnowledge* - would provide content delivery via searchable databases, parts-matching information and logistics ratings, as well as a virtual community of industry experts who provided online advice.
- *ConvergeMove* - was designed to ensure visibility at the stock keeping unit (SKU) level for all shipments by providing a centralized contract management and analysis system which monitored logistics, automated shipment processes, aggregated traffic and optimized shipping patterns.
- *ConvergeConnect* - would integrate supply chain partners by streamlining systems and removing complexity and redundancy from work processes.

In February 2001, Converge Inc. bought NECX.com from independent marketplace VerticalNet, Inc. The deal allowed Converge.com to integrate the first and largest open-market trading exchange dedicated to the purchase and sale of electronic components, computer products and networking equipment into its existing *ConvergeTrade* service line. As a result of the transaction, Converge, Inc. also became a 50 percent owner of both of NECX Asia (a subsidiary of NECX.com) and Sumitronics Asia Holding Pte. Ltd, a subsidiary of Japan's Sumitomo corporation. The merits of the deal were confirmed in April 2001 when AMR Research, a high profile industry research group, cited Converge.com as having the "top trading exchange service" for the electronics and high technology. However, apart from its exchange service, Converge.com had yet to realize any revenue from its other services as they were still in the testing and development stages.

ENCOUNTERING RESISTANCE

Over the past several months, Y.C. Goh (Executive Director - Materials Asia) and C.P. Teh (Senior Director - e-Business) had held numerous discussions with many of Seagate's internal and external stakeholders as a means for explaining the merits of e2open. Although many of these stakeholders acknowledged that the *ISM* had "potential," most cited one or more concerns for refusing to become an early adopter.

Price pressures

Ever since Cosvisint.com emerged as the first *ISM*, suppliers had become concerned that such similar ventures, regardless of the industry, were being established by powerful buyers who sought greater price concessions by pitting suppliers against each other in highly visible trading environments. However, Seagate strongly maintained that it supported e2open mainly because of the potential for industry collaboration. Still, Goh and Teh acknowledged that some of the other founders had different motivations for joining e2open. As Goh, the 15 year materials management veteran, suggested:

The intent of this project is good because it creates all kinds of opportunities for collaboration. At the same time, our 10 founders collectively buy US\$200 billion worth of supplies each year, so why not come together and enjoy the benefits of combined purchasing power instead of paying more than we need? I think what happened with the JIT [just-in-time] manufacturing hubs has made some of our partners nervous. Not so long ago, we held our parts and components inventory in warehouses for several days or weeks before they were used in manufacturing. But then we changed the situation by having our third party logistics service providers hold the inventory in their warehouses until just a few hours before it was needed. This may be creating a 'how will they get me now' reaction by distributors and suppliers, which in turn is causing people to resist e2open. But as we have said all along, this venture is not about price - it's about collaboration.

Security

In several surveys conducted with the company's founders, Strategic Members and other potential

high activity customers, e2open discovered that the issue of security management consistently ranked as one of the most serious concerns among all respondents. The single biggest fear expressed by the respondents was that sensitive competitive information might fall into a rival's hands if appropriate systems and procedures were not developed. The respondents also cited concerns regarding the integrity of the data being transmitted, since corrupt or altered files could wreak havoc on the operations of its users. Like many other types of new online business models, the threat of intruder abuse also needed to be mitigated before users would feel comfortable using an online platform. Furthermore, potential customers wished to have assurances that only certain users were able to access certain elements of any given collaborative design project. Since the electronics and high technology industry was intensely competitive with product life cycles becoming increasingly shorter, any leakage of information regarding new product designs might jeopardize a project. This meant that companies often went to great efforts to ensure that most members working on collaborative design teams did not have full access to all details of any given project.

Compatibility

Another major area of concern was the difficulty anticipated in achieving true seamless interoperability among the disparate information systems used by various enterprises. Given that e2open's customer base was expected to consist of a wide range of industry players based around the globe, the ability to ensure a stable platform that provided streamlined and standardized communications was viewed as an essential factor for success. This implied that some language translation capabilities would be needed, and that users would be willing to accept certain imposed formats for different types of electronic documents.

Cost

The lack of a formalized pricing schedule for e2open's collaboration services also raised concerns by some potential users. Many of potential customers agreed with the need for some form of flexible pricing to take into account differences in usage patterns and intensity. At the same time, many of the same potential users also wished to ensure that a reasonably "level playing field" was

maintained to prevent the creation of any advantage arising from price discrepancies for e2open's services.

Some Conscientious Objectors

In contrast to the numerous industry heavyweights that had invested in e2open or Converge.com, other industry leaders such as Dell Computers, Intel and Celestica had deliberately avoided *ISMs*. Celestica's absence was notable because, as the world's third largest electronics contract manufacturer (after Solecron and Flextronics), the Canadian-based company produced a variety of components used by a wide range of industry participants, including Cisco Systems, Hewlett Packard and IBM. Instead of becoming a founding member in either e2open or Converge.com, Celestica chose to focus on participating in private (closed) marketplaces operated by its largest customers in order to improve collaboration and develop deeper relationship. As Bernie Ulrich, Celestica's Director of Global Supply Chain Management and e-Business, stated,

*If you want customer intimacy, would you go to Times Square? At the end of the day you have to establish a one-on-one relationship, and that's easier on a private exchange.*¹³

Ulrich also suggested that the functional capabilities of open marketplaces were also too limited to warrant Celestica's participation. At the same time, however, he did see some promise for *ISMs*, but likened their development to the advent of air traffic control systems in the early part of the 20th century, because they took years to build due the coordination needed to harmonize operating procedures and communication systems. Ulrich summarized by saying,

*You can't put these things in place overnight, you still need standards, consistent rules, and more participants to effectively create a marketplace.*¹⁴

REACTING TO THE FEEDBACK

After listening to the concerns of many different stakeholders, Goh and Teh took some time to reflect on what they heard before formulating their recommendations. In summarizing his thoughts

¹³ Electric Shock. www.informationweek.com 18 September, 2000.

¹⁴ *ibid.*

about what he heard, Goh suggested that greater educational efforts were needed to "evangelize" the merits of e2open:

Back when Seagate first started out, it was concerned with pumping out the right volumes... everybody was talking EOQ [economic order quantity]. Then the company embraced MRP [material resource planning], but these activities ignored capacity utilization. So then we embraced ERP [enterprise resource planning], which gave us a much broader picture of what was going on internally. Unfortunately, this did not tell us what was happening with our supply chain partners, which is why we are extremely committed to SCM and, by extension, the e2open concept. But many people are looking for excuses not to participate in e2open, so we must educate them about its benefits. Our partners must come to understand that the entire industry has evolved and is now being driven by shorter and shorter product life cycles. This means that design people are coming under increasing pressure to develop viable new product designs in a hurry. Through the use of e2open's design collaboration service, design teams can get early 2D and 3D views on any given project from anywhere. There's no more need to wait for faxes or DHL to delivery documents. And because the system is Web-based, people can access a design project from wherever there is an Internet connection or phone line. So if you are transiting in an airport, you can still access the latest design project that you have been working on. Now that's a step in the right direction!

Making the business case for improving SCM systems is tougher in Asia than in the US. You have to constantly sell the idea of the need for greater efficiency. What's more, the inherent cultural diversity among e2open's stakeholders exacerbates the situation because communication problems and misunderstandings can easily arise, even over relatively simple things. The issue of business process preferences is also a concern. If you can believe it, to this day some of Asia biggest

electronics companies still use fax or phone as their preferred means of communication. They haven't become part of the digital generation yet, so it is up to us and e2open to help show them the way.

Concern over the issues of cost and security were top-of-mind with Teh, the ex-Cap Gemini IT consultant:

The cost issue is tough to resolve. On the one hand, you can't talk prices with a customer until they know what they want to use. On the other hand, we want users to embrace e2open, so we need to establish a clear pricing policy that doesn't discourage adoption. One strategy that Seagate is considering is to buy a large block of say 1000 seats, and then apportion 200 or so to our most valued distributors and suppliers. As a founding member buying such a large block, we would expect to receive some type of discount. We could then "sell" these seats to our partners on a cost recovery or even subsidised basis. We are not in business of selling seats for fancy software, so we are not interested in making money this way. We also want to give our partners an incentive to adopt e2open.

After eight months of operations, e2open still does not have a fully developed set of service lines. This means we are battling the need to show proof of concept over other business models. So we are left with the old chicken and the egg thing - you can't prove the concept until you have people willing to give things a try. As a starting point, we should highlight the successful pilot tests that have been conducted so far, which in fact show that the security management systems e2open has in place are its highest ranked feature, even though there are still some bugs in the system. But all kinds of software companies go to market with bugs in their code - it's matter of how much you can live with and how stable the software generally is. Sometimes you have to roll things out without being perfect or else you will lose a window

of opportunity. This is what has happened with our first version security management system, but we already have a better version 2.0 on the way and we expect to have a third version in place by September [2001]. The reason we are willing to upgrade so quickly is because as usage increases, the prospect for discovering bugs increases, and therefore we can take corrective action.

NEXT STEPS?

As Y.C. Goh and C.P. Teh gathered to formulate their recommendations about how e2open could improve its prospects in the near term, they realized that several concerns raised by various stakeholders and interested parties over the past few months needed to be addressed. For example, what made e2open different from other online B2B business models? How viable was the model? What advantages did e2open have over ECnet and Converge? How might e2open mitigate supplier's concerns about the possible downward pressure on prices of items traded in the online marketplace? How should the portal address issues of cross enterprise compatibility, operational security and membership and usage fees? Without suitable answers to these questions, Goh and Teh knew that e2open would continue to face an uphill battle.

EXHIBIT 1
OVERVIEW OF SEAGATE'S SUPPLY CHAIN

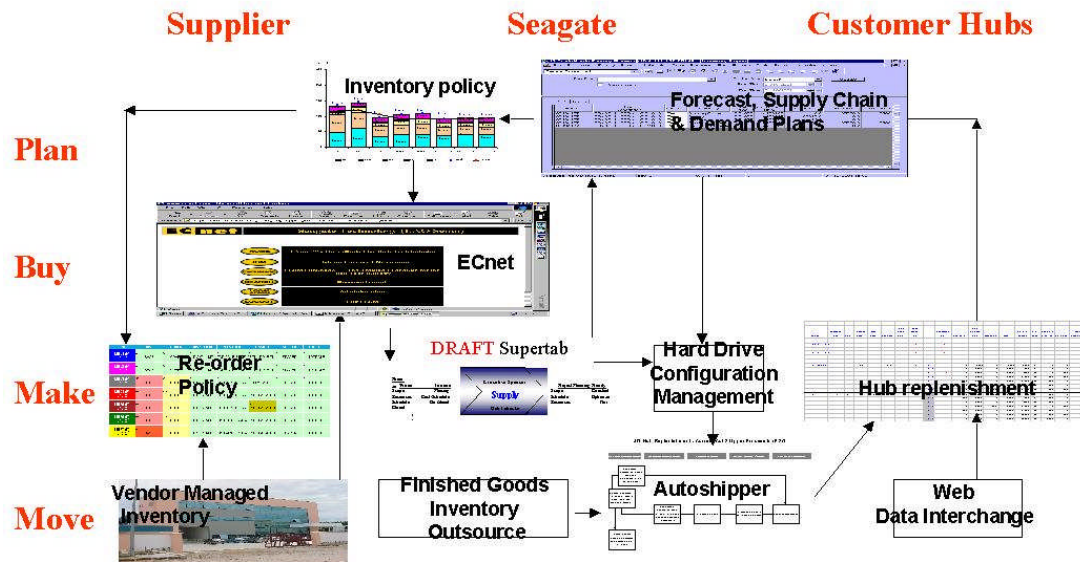


EXHIBIT 2

OVERVIEW OF E2OPEN SERVICES

Design Collaboration Services included:

- Synchronized information was provided through:
 - “Project views” containing complete project records
 - Change/revision histories for multiple data types
 - Powerful search capabilities by attributes, topic keywords and key text
 - View and markup capabilities
 - Process definition and management
 - Ad-hoc routing and workflow
 - Audit trail replaces localized records
- Multiple forms of communication were available via:
 - Interactive media: web meetings, instant messaging, threaded discussions
 - Published media: alerts, written documents

Supply Chain Services included:

- Forecast Collaboration - enabled partners to share forecasted demand and commit information; applied exception-based business rules with proactive alerts.
- Order Execution Collaboration - managed the order process through transmission, acceptance and delivery on a reliable, secure platform.
- Inventory Collaboration - provided inventory visibility and projections with triggers and alerts, and enabled inventory management, consumption and pull triggers.
- Capacity Collaboration - enabled improved visibility into and reservation of production capacity.

Open Markets Services included:

- Direct Selling - utilized the Internet as a tool to sell directly to existing and new customers.
- Channel Assistance - assisted channel partners in selling directly to their existing and new customers.
- Open Excess - cleared excess inventory in a cost-efficient and controlled process.
- Strategic Sourcing - utilized an Internet-based request for quote (RFQ) and negotiation platform to complement sourcing processes.
- Spot Purchase - matched and fulfilled spot purchase requirements for components and subsystems.