Tuck

Agile Software – I Want My WebTV![1]

Introduction

Carol Schrader shifted in her chair, trying to focus on the conversation bouncing around the room. It wasn't that she was uninterested in the topic. The group was debating the strategic direction of the firm's software products. But like a jeep caught in the deep ruts of a muddy road, her thoughts kept falling back to the week's stock market headlines. August of 1999 had not been a kind month for NASDAQ initial stock offerings. In fact, the whole summer was beginning to feel like a downward spiral. The worst headline had appeared that morning on the front page of the *Wall Street Journal*, "For Net-IPO Party, the Balloons Begin to Pop."

Carol was the Vice President of Marketing for San Jose-based Agile Software. As the fourth largest shareholder on the management team, she was not alone in her concern. Agile was a supplier of product content management software for use over the Internet within and among companies in a manufacturing supply chain. The suite of Agile products was designed to improve the ability of the supply chain members to communicate and collaborate with one another about new or changing product content. The software was particularly useful for managing virtual supply chains where manufacturing and distribution functions were outsourced to contract partners. Agile had been in business for over four years and had launched its first non-web based product in 1996. In many ways, Agile's products were well suited to become fully web-centric and with the growing wave of interest in Internet business-to-business applications, the firm quickly redesigned its products to leverage the power of the web.

Carol joined the firm in 1997 and saw the company grow from 75 employees to over 150. Along the way, Agile had received infusions of venture capital from some of Silicon Valley's most prestigious firms including Sequoia Capital and Mohr, Davidow Ventures. With the backing of Morgan Stanley, the company planned to go public in August. Over the past four months, CEO Bryan Stolle and CFO Tom Shanaham had been on a nonstop road show, pitching the company to investors. In their absence, Carol and two other key executives had to pick up the slack of

[1]This case was written by Professor M. Eric Johnson of the Tuck School of Business at Dartmouth College and Professor Hau L. Lee of Stanford University's Graduate School of Business. It was written for class discussion and not to illustrate effective or ineffective management practices. Version: 2/27/2002.

running the company. With the anticipation of the public offering, pressures had mounted. June had been an outstanding month for IPO's with many stocks skyrocketing from their initial price. But, as the summer wore on, interest rates started climbing and the stock market became more and more jittery. By the beginning of August, the market had seemed to have lost its appetite for IPO's. Agile's offering was in a holding pattern, yet the firm had to push on with an aggressive development strategy to solidify its product offerings. Carol squirmed again in her seat and refocused her attention on Agile co-founder, Joe Fazio who was describing what the future might hold for Agile's products and customers.

From PDM to Supply Chain and Product Change Collaboration[2]

One of the seeds of Agile's genesis was planted over five years ago at a vendor panel discussion held at the end of a CIMdata PDM (Product Data Management) conference. At the time, PDM systems were mostly UNIX-based, and typically provided configuration control, workflow and process management, data vaults and document management, classification features, program management, and so forth, to support manufacturers in product design and changes. One prospective PDM customer stumped the panel by asking them which system would work for a mid-size manufacturer with around $100 million in revenues like his own. He didn't think any of the systems shown at the conference would work for a company as "small" as his, and apparently, neither did any of the vendors. Even the implementation of a pilot PDM system required significant investments that only large manufacturers could afford. Such costs include installation, extensive user training, and system integration as well as on-going costs for system maintenance, support, and upgrades. The thought of creating a PDM system for manufacturers of all sizes appealed to Bryan Stolle, then working for PDM-vendor Sherpa and sitting in the audience.

At the same time, Mat Moran and Joe Fazio had talked with each other about starting their own PDM company. Moran was an independent PDM consultant experienced in using systems from Sherpa, Hewlett-Packard, and Auto-trol while Fazio had used a Sherpa system during his time at disk drive manufacturer Micropolis. Stolle left Sherpa in November 1994, and together with Fazio and Moran, and Tom Shanahan, Sherpa's then interim CFO, worked out a business case to develop a new PDM system. Fazio, Moran, and Stolle became Agile's first employees while Shanahan acted as Agile's chairman of the board. They soon picked up Carlos Camacho, a former Sherpa engineer who had also left out of disappointment. This formed the Agile founding team. Besides focusing the application to fit the needs of mid-size manufacturers, they further decided that their system would be an off-the-shelf, Windows NT and Java-based system that would be configurable with no need for customization.

The team first developed a prototype of this PDM system using Microsoft's Visual Basic and Access programs, and their first internal product demonstration was held in September 1995. The company shipped its first product, Agile Configurator, in June 1996. Within the next three years it licensed over 300 customers primarily in computers and peripherals manufacturing,

[2] Part of the history of Agile Software was abstracted from the *Engineering Automation Report* in December of 1997.

electronic components manufacturing and distribution, consumer electronics, data networking and telecommunications equipment, medical equipment and semiconductor equipment markets. Their customer list included such companies as Gateway, Texas Instruments, Phillips, Lucent, Solectron, Flextronics, WebTV, and PairGain. Agile had enjoyed quickly growing revenues (see Exhibit 1), growing from $1.3M in 1997 to nearly $17M in 1999. Exhibit 2 gives a representative list of customers that collectively accounted for more than 25% of the total revenue of fiscal 1999.

From its modest beginnings, Agile had always focused on complete customer satisfaction with "100% referenceability" being a key company value. The company believed that knowing and understanding the customer's business problems would drive the right product development. Such an emphasis led to the company's evolution from a PDM-based system company to one that provided Internet-based solutions for supply chain partners in the area of product collaboration. They realized that product definition can help, but in order for product design and development to be effective, collaborative efforts were crucial. Hence, Agile expanded its product offerings to support the interaction between designers, suppliers, and manufacturers. Agile referred to this collaboration as "Design for Supply Chain."

Supply Chain Synchronization Through Agile Software

Agile's customers in the electronics industry faced many new challenges in managing their supply chains. Both technology and buyer behavior was changing the channels for their products and the expectations of their customers. Increasingly, customers desired greater product variety and demanded instant order fulfillment. Channel changes including consolidation through large super stores and direct sales via the Internet created new opportunities, but shifted power and relationships within the distribution channel. Equally important, both large and small original equipment manufacturers (OEM's) were increasingly focused on product development and customer relationship management rather than traditional manufacturing and distribution functions. Many large OEM's were outsourcing their manufacturing operations to a growing industry of global manufacturing service providers. Moreover, many new OEM's were entering the marketplace, operating virtual supply chains by outsourcing all aspects of material flow and manufacturing to third parties.

Managing virtual supply chains made many old problems, like product content synchronization, far more important and complex. No longer was supply chain excellence achieved by simply matching supply and demand. For example, if product content information was inaccurate, suppliers could supply the right quantity of the components to the manufacturing service provider, but they would be the wrong release level for that component. Customers could get the exact quantity of product they ordered, in the desired time frame, yet they would be to the wrong specification. On the other hand, ensuring that the product content was correct could take weeks of changes and delays, making a new product late to market and missing early mover opportunities.

Agile's software products were designed to enable product content synchronization across the supply chain. The software did this by facilitating product content management, communication,

and collaboration. Product content is all the information needed to manufacture the product to the correct specifications. This includes the bill of materials, which is a list of parts and sub-assemblies that make up the product, the list of approved manufacturers for each part, and process information needed by manufacturing to build and test a quality product. Typically, bill of materials (BOM) are arranged in a hierarchical format. For example, at the highest level is the final product. The next level of the BOM consists of major sub-assemblies followed by the smaller assemblies and components that make up each sub-assembly. Accuracy of this information is critical for procurement to buy the correct parts and manufacturing to assemble the right product. By maintaining easy to use and accurate information about the product content, Agile's software helped OEM's manage their ever-changing products.

Yet Agile's OEM customers found that maintaining up-to-date product content was not enough. The information had to be shared with their supply chain partners. Moreover, they found that sharing product content information was useful during all stages of a product life cycle – not just during new product introduction. In the design stage, OEMs communicated large amounts of data such as the specification of the finished product and its associated BOM with its supply chain partners. During the new product introduction stage, the supply chain partners exchanged additional information concerning product changes resulting from new constraints or improvement opportunities discovered by suppliers during the prototyping and pilot production phases. In the volume-production phase, product specification changes were often driven by customer requests or market conditions, design corrections for quality or process efficiency improvements, or changes in the costs or availability of components. Agile's product facilitated such sharing by making the product content available to supply chain partners over the Internet.

Finally, by making product content readily available to supply chain partners, the process of content management itself changed. Traditionally, product changes followed a push process with the OEM engineers making product design decisions and sending those decisions to others in the supply chain. Without instant access to content information, others within the supply chain often operated with old information and could never be sure they were working with the most recent design. More importantly, communication about product content was slow and hindered feedback from supply chain partners. For example, if designers specified a new component or product change that made the manufacturing process more difficult or affected the end quality of the product, it would often take days or weeks to discover and fix the problem. Agile's software allowed supply chain partners to see the most recent information and suggest changes. Such collaboration made it possible to speed product development through concurrent engineering where all supply chain partners participated in the design process.

One of Agile's first customers, PairGain Technologies, Inc. was the world leader in the design, manufacture and marketing of DSL (Digital Subscriber Line) networking systems. Service providers and private network operators worldwide used PairGain's products to deploy DSL-based services, such as high-speed Internet, remote LAN access and enterprise LAN extensions over the existing infrastructure of copper telephone lines. PairGain had experienced many of the benefits of synchronized product management. In the past, the process for releasing new products and product changes was manual and paper driven. It required many meetings and extensive travel between PairGain and its manufacturing partner SCI. The labor-intensive activities slowed product development and caused many expensive mistakes. After using

Agile's product for the past three years, the need for frequent design meetings evaporated. Both within PairGain and at SCI's manufacturing plant in Brazil, engineers could interact daily with an ongoing dialog about product content.

Along with the improved product content collaboration, PairGain had also restructured its supply chain to synchronize the flow of information, material, and cash, reducing inventory and slashing costs. In the past, the supply chain often held up to six months of component inventory, making it very expensive to implement sudden design changes that obsoleted existing components. By 1999, with only a few days of inventory in the pipeline, product changes could be made within one week. Because component prices were constantly dropping, PairGain was able to reduce its purchasing costs by not making purchasing decisions months in advance. In fact, on many standard components, payment for components was made electronically upon consumption. Its component supplier, Arrow Co., held inventory at the SCI plant in Brazil and delivered just in time to the production line. For PairGain, re-engineering the management of product content was a critical step in synchronizing the entire supply chain.

Agile at WebTV

WebTV was typical of many recent Agile customers. Founded in 1995, WebTV's mission was to bring the Internet into people's living rooms via the television. Early in the history of the web, WebTV recognized that new technologies would hasten the convergence of entertainment and information. Before the company released its first product, it was acquired by Microsoft Corp. in 1997 and since then had operated as a Microsoft subsidiary. WebTV designed, manufactured, and distributed TV set-top boxes that allowed customers to use their TV's to surf the web. The products were manufactured by providers of electronics manufacturing services (EMS) such as Flextronics and SCI and sold through a group licensed marketing partners including Sony, Phillips, Samsung, and Panasonic. The products, which retailed for about $199, were sold with an Internet service agreement. Customers paid a monthly fee for web access through WebTV.

Like many high tech companies, WebTV managed a complex supply chain without ever physically touching the materials or product. Starting from the component manufacturers and suppliers then to EMS for assembly and finally to the licensee to be packaged with other products and sold, WebTV coordinated material and information flows. Managing the information needed by each player in the supply chain was by far one of the biggest challenges. In no area was the challenge greater than in product specification. For example, a new WebTV product would first emerge from the lab as a prototype with a rough specification. During design, engineers would not precisely specify each electronic component, but rather simply specify its function, like memory. Upon completion of the design, engineering coordinators would start the long job of translating the initial design into a product that could be manufactured. This process required the coordinators to specify active part numbers from WebTV's preferred vendors for each of the many components. Along the way, the product and component choices would be reviewed to ensure that the selected components would deliver the desired quality. Sometimes a component could be sourced from many different suppliers, yet

WebTV engineers would find that only one or two vendors had a component that met their exact quality and functional specifications.

When completed, this first bill of materials would traditionally be stored in a spreadsheet or in the company's Oracle database. Besides the information noted on the original drawings, the bill of material would include information on the component types, preferred supplier, and other quality specifications. This information formed the basis of the product specification. At this point, a product content engineer would take over responsibly for managing the product specification. However, often before the product was released to the EMS, the specification would begin to change.

Ian Chin, one of the product content engineers, described WebTV's old change process as a nightmare.

> *Changes could come from many different places. Sometimes a change would be requested by the design engineers. Other times, the EMS or component supplier may request a change because of problems in manufacturing or the unavailability of a specific component. In any case, I would first have to document the change request, describing the desired change, the new component and the old part to be replaced. Often, I would also need to include a short history of related changes and rationale for the current change. I would then fax or email the change request to a long list of those people within WebTV (such as design engineers, component engineers, component buyers, manufacturing engineers, and product line managers), the component suppliers, EMS, and licensees who must approve the change. After that, it was like being a nagging nanny, trying to get all the players to approve the change. If any of the "approvers" had questions or needed clarifications, I would assemble more product information for them or connect them to the appropriate people who could answer their questions. The whole process took weeks.*
>
> *Once I had the required approval signatures, I edited the initial request to transform it into a change order and then emailed it again to all the players. However, because there may be substantial component inventories of the old part in the pipeline, the actual change would often not take place for weeks. In cases where the change did not effect final product quality, the old component would be used up before the change occurred. In those situations, component buyers would have to monitor the change and component inventories until the change could take place, and then notify everyone later when the actual change was made.*

Ian laughed as he thought back to how difficult the change process was just a few short months ago. WebTV had implemented the first phase of Agile Software internally in early 1999. Using the Agile system, product changes were greatly simplified. All of the product content including drawings, bill of materials, approved vendors, process instructions, and a complete product history were all stored together in the Agile system. Now when Ian needed to make an engineering change, he simply went into the Agile system and made the proposed change. The system would indicate the change as a proposal, along side a complete history of changes for the product. For each change, comments were also included so anyone tracing through the product

history could see why changes were made. When the proposal was complete, Ian would route the proposal with a single mouse click. The Agile system had a list of all of the people who had to be made aware of a change to that product. There were two key groups – Approvers and Observers. Approvers had to approve the change while observers were people who must be updated on changes, but who did not need to approve changes. Agile automatically sent an email message to the approvers and observers telling them of the proposed change and providing them with a hyperlink to the subject within the Agile system. By clicking on the hyperlink (which was password protected), the approver or observer could see the proposed change, including drawings and product history. If the approvers agreed with the change, they simply clicked an acceptance button that was recorded by Agile. After that, anyone who looked at the proposal could see who had accepted it thus far and who had not yet registered an acceptance or rejection. The Agile system could also be configured to nag laggard approvers who did not accept the change within a specified time period. When all the required approvers had accepted the change, the Agile system would automatically notify everyone that the change had been approved and release it to manufacturing and procurement.

Ian loved the fact that engineering changes were transparent and reasonably painless. It was impossible for anyone to change the bill of materials without everyone knowing it and changes happened much more quickly than in the past, sometimes within a couple hours. However, WebTV had not yet rolled out Agile to all its partners. Because of initial security concerns, the Agile system was limited to players within the WebTV Intranet. In particular, WebTV wanted to ensure that partners would only be able to access material directly related to them. For example, WebTV did not want Sony to be able to see Philips' products nor did it want SCI to see products manufactured by Flextronics. This was harder than it sounded because the bill of materials often contained sub-assemblies that were shared in the final product for multiple licensees and assembled by several different EMS.

Agile had recently released a new version of its software that satisfied many of WebTVs security concerns. WebTV planned to roll out the new Agile system to all of its partners within the next year. Ian felt that this would be a major improvement because they still had many problems coordinating with the component suppliers and EMS. For example, recently WebTV had made a change in a new product assembled by SCI. The change was related to a specialized component that was supplied from Marshall Industries. The procurement managers at both WebTV and SCI made the change and started ordering small quantities of the new component from Marshall. However, because of some communication problems between the three partners, no one updated the forecast for the new component to reflect the ramping volumes that were planned. Neither Marshall nor SCI realized the oversight and no plans were made with the component manufacturer to ensure the needed quantities would be in place. Marshall had a small number of the components in inventory and simply sent them to SCI, giving SCI the feeling that the part was readily available. When SCI placed a large order for the component, Marshall realized the mistake, but it was too late. Toshiba, who manufactured the component, could not deliver the component in time for the pending ramp up. For WebTV, this meant having to go to the licensee and explain why the new product would have to be delayed for several weeks. The licensee had planned a major product rollout supported by advertising and had made many promises to its channel partners like Circuit City. After tense negotiations, Toshiba offered to switch production at one of its plants to expedite production of the chip, but at a cost of $3 million. In

the end, rather than delay the product introduction the three partners, WebTV, SCI, and Marshall, split the cost and expedited the chip.

While such large-scale disasters were rare, the costs of many smaller mistakes were significant. For example, on a more routine basis, mistakes that created short delays in component deliveries to the EMS meant that reserved capacity at the EMS would go idle waiting for the part. In cases where the delay was clearly related to stumbles in WebTV's product change process, the EMS would ask WebTV to help pay for the cost of the disruptions, typically $5,000-$10,000 per day. Ian was confident that many of these costs could be avoided when Agile was rolled out to all of WebTV's partners.

Agile at Flextronics

Flextronics (Flex) was the fourth largest electronics manufacturing service (EMS) provider (behind SCI, Solectron, and Celestica), with over $2 billion in revenues and 17,000 employees worldwide. Like other large EMS providers, Flex had operations in many different countries including plants in the Americas, Asia, and Europe. They provided a full spectrum of design, manufacturing, and distribution solutions for a wide range of OEM customers in many different businesses.

Flex's plant in Zhuhai China was one of its newest operations. The plant was a vertically integrated producer of consumer electronics products such as cell phones. Within the gleaming large facility, Flex operated a printed circuit board fabrication center, many printed circuit board assembly lines, and several supporting operations such as plastic injection molding and tempo painting machines. With these capabilities, the Zhuhai operation provided many of the key processes needed to manufacture products such as cell phones and computer peripherals. Only electronic components and packaging were acquired from outside vendors.

The 1500-person plant was managed by Tim Dinwiddie. Tim had joined Flex only 8 months earlier after 15 years experience working in Asia with companies like Motorola. Tim's wife and two children lived in Hong Kong where the kids could attend English-speaking elementary schools. Each Monday, Tim would board a Hydrofoil ferryboat in Kowloon for the one-hour trip across the Pearl River Estuary to China (Exhibit 3). His driver would meet him at the dock in Zhuhai and drive him another 45 minutes inland to the plant. The plant was less than two years old, located in a rural area surrounded by rice paddies and banana groves. During the week, Tim lived in a company-owned apartment in sight of the plant and employee dorms. Tim didn't mind the commute, but missed spending time with his family during the week. Like many expat managers working in Asia, Tim viewed the disruption as the price one must pay to participate in the explosive growth and opportunity China afforded.

The 1500-member workforce in Zhuhai was predominantly young Chinese women, 17-20 years old. All of them lived in the company dorms, wore company issued uniforms, and ate at the company cafeteria. Flex also provided extensive training to develop the skills necessary for high tech manufacturing. To offset the costs of training, workers signed a one-year initial contract. Flex guaranteed the workers 8 hours of work per day. If the company did not have work, the

employees would be sent to the dorms and receive 70% of the base pay. Many of the women came from villages that were hundreds of miles away from the plant, seeking an opportunity to work and save money. After 3-4 years, many would return to their home villages to get married and raise a family. Thus, the workers key interest was to work as much as possible and save as much money as possible during their tenure at Flex. In fact, many wanted to work overtime (the maximum allowed by law was 12 hours/day). Even though they received 70% of base pay if the plant was idle, most workers preferred to be working and making more money.

Tim was very proud of the plant. Inside, the factory was well lit and very clean. The printed circuit board assembly lines used the latest Seimens equipment for placing surface mount components. The facility was air conditioned and followed strict ISO14000 environmental standards. Throughout the plant, a demand-flow, kanban system tightly controlled work-in-process and overall quality was on par with world-class standards.

With the production lines running smoothly, Tim felt his biggest challenge was keeping the work flowing in the plant. Flex's resident workforce made interruptions that stopped the lines expensive. One of the biggest causes of line shutdowns was material shortage. Because nearly all the electronic components assembled onto the boards were imported into China, Tim's procurement staff were constantly scrambling to ensure long-leadtime materials would arrive on time. Sometimes, shortages at the component vendors or problems in transporting material into China caused late deliveries. However, more often than not, it was problems with the product specifications.

Zhuhai received most of the product bill of materials from its OEM customers in spreadsheets. Sometimes the spreadsheet files would be attached to email messages. Other times they would arrive by fax or on a disk in an express mail envelope. Many times, drawings for the product would arrive separately in CAD files or paper drawings. For new products or revisions of old products, the bill of materials would almost always contain errors. Product engineers in Zhuhai would take turns staying late in the evening so they could call and email their customers in the US and Europe to get clarification on the product design. Besides having the wrong or missing parts, there were also many problems related to the component vendors that the customers desired. Often an OEM customer would want components sourced from a specific vendor. Typically, they chose vendors based on quality and price. Because the OEM's were often large companies, they were better able than Flex to negotiate low prices for the components; yet, when Flex went to order the components, confusion concerning the agreed upon price often caused delays. Worse yet, sometimes Flex buyers would end up getting a higher price, not knowing that the OEM had already negotiated a better price. In some of those cases, Flex would end up eating the price difference. Other times, when a preferred vendor was unable to deliver components in time, Flex would seek permission from the OEM to use a different vendor. For the OEM, this typically required a long approval process to ensure quality and to negotiate price. Tim was convinced that improving the long process of getting a clean bill of materials would improve his efficiency and product quality while reducing the occurrence of costly delays.

The Agile Suite of Products

By July 1999, Agile had created a suite of products (Agile Anywhere) that utilized the XML (Extensible Markup Language) technology to provide a comprehensive business-to-business solution for product change collaboration and synchronization across a supply chain. Agile was a strong supporter of the use of XML as the open standard for supply chain collaboration in the electronics industry. Indeed, as early as December 1998, Agile teamed up with the National Electronics Manufacturing Initiative, Solectron, and semiconductor distributor Marshall Industries to propose an XML-based standard for companies to exchange product information such as bills of materials or engineering change orders. Agile also a key member of RosettaNet, an independent, self-funded, non-profit consortium to develop and deploy standard electronic commerce interfaces to align the processes between supply chain partners.

The core of the Agile Anywhere product was Agile eHub, which managed product content, processes and business rules. It comprised of a series of application servers that enabled users to define, store, change and manage product content information. Agile eHub ran on Microsoft NT, and employed encryption technology licensed from RSA Data Security was used to maintain secure data transmission over the Internet. All the Internet applications were Java and HTML-based that could run on versions of Microsoft Internet Explorer and Netscape Navigator. The products could be integrated with more than 15 enterprise resource planning systems including, among others, Oracle, J.D. Edwards and SAP. At the backend of the product were the database server and the Agile Internet File Server. The database server could either be Microsoft SQL Server, connected through Open Database Connectivity, or Oracle's database, connected through direct integration.

Future for Agile

Carol found herself again calculating the value of her options. Morgan Stanley had set the initial price for Agile at $22/share. The company had been touted by several business magazines as one of the most promising pre-IPO technology companies around. However, with the market behaving as it was, who knew when the stock would be released? The current plan was to wait another two weeks and hope the market would settle down. Carol shook off the stock worries, telling herself it was silly to worry about something so out of her control. Joe Fazio was becoming more and more animated as he worked on the white board.

> *Right now there are five ways Agile customers can use our software (see Exhibit 4). For example, an OEM like WebTV could communicate internally and with its partners like component suppliers or EMS in several ways.*
>
> 1. *Internal users (or partners who have direct access to the OEM's network) could use the traditional eHub and access Agile's software via Windows.*
> 2. *They can enable outside users to access the eHub via an Internet content manager with a web browser. For the external user, this will feel very much like the windows system. However, the Java language used to create the browser has limits that gives the product a different feel than the Windows based version created in C++.*

3. *OEM's could publish the product content in a PDX file and email it (or mail it on disk) to their partners. We have developed a free reader called Agile eXpress Viewer (like Adobe Acrobat) that they can distribute to their partners to view the PDX files.*
4. *If their partner also operated an Agile eHub, then they could push PDX files to their partners over the Internet. These files would be loaded into the partner's eHub and then viewed and modified as they would within the company.*
5. *Finally, the OEM's could have their partners access myAgile.com, which is our new portal service. Through myAgile (with the appropriate security clearance), they could access specific information on the company's eHub, again using a browser. The advantage of myAgile.com is that it creates a community of users who have similar interests and information needs. For example, other eServices could be offered in the portal. Component suppliers may find the portal an excellent opportunity to link to their OEM customers with pricing and product information.*

Joe gazed excitedly at the white board and then turned back to the group. A smile left his face as he started to push the group on the future for Agile.

My concern is how we position ourselves in the long run. Right now customers love our solution for managing product content, but is that a big enough application space for us to continue to grow? Besides, while we are ahead of everyone right now, we will face increasing competition from at least three sides. ERP vendors like Orcle and SAP won't sit by and watch us succeed in this space without coming up with their own offering. Supply chain vendors like I2 and Manugistics also will be driven to enter our space. And finally, all the engineering design companies that produce CAD software would certainly like to grow up into the product management space. Do we have a big enough footprint to become a major business platform centered around managing the product? Surely our pending merger with Digital Markets will help us expand our footprint.

Digital Market Inc. was a Sunnyvale-based start-up company offering an Internet-based solution for sourcing and procurement called Digital Buyer. By facilitating the quote, bid, and order transactions, Digital Buyer helped manufacturers speed the procurement process and reduce direct material costs. Digital Market's customers were primarily OEMs and contract manufacturers in the electronics industry. Buyers in these companies were often faced with the task of finding, procuring, and pricing hundreds of electronic components for a single product from thousands of different suppliers. Traditionally, this labor-intensive process was accomplished through many phone calls, faxes, and emails. Digital Buyer was designed to automate this process by enabling buyers to build and manage lists of preferred suppliers; automate the communication with these suppliers using the Internet; aid in the generation, retrieval and analysis of request for quotes (RFQs); store, retrieve and sort part information including the generation of alternative part lists; perform BOM cost analysis; and rapidly identify missing or short-supply parts. Beyond reducing the cost of procurement functions through automation, Digital Buyer helped manufacturers reduce direct material costs by effortlessly increasing the number of bidders for each component. Equally compelling, Digital Market's customers had found that they could cut the time required to procure components by more than a half, thus speeding their products to market.

Joe plopped down into one of the soft conference room chairs and sighed audibly.

> *The marriage of Agile Anywhere with Digital Buyer is certainly irresistible. Our customers will be able achieve almost unimaginable benefits from the pair. Yet, it is so hard to see where the future of these two products might lead.*

Exhibit 1: Agile Financial Information[3]

	Fiscal Year Ended April 30, 1997	1998	1999
Consolidated Statement of Operations Data (in thousands):			
Revenues:			
License ……...	$ 1,143	$ 6,102	$10,859
Professional services ……..	187	1,385	3,665
Maintenance ……...	22	516	2,283
Total revenues ……	1,352	8,003	16,807
Cost of revenues:			
License ……...	113	543	819
Professional services ……..	88	1,347	3,823
Maintenance ……...	65	278	1,343
Total revenues ……	266	2,168	5,985
Gross profit ……	1,086	5,835	10,822
Operating expenses:			
Sales and marketing ……	2,149	8,070	13,495
Research and development …….	2,510	3,788	4,742
General and administrative …….	1,333	1,995	1,938
Amortization of stock compensation .	----	856	2,253
Total operating expenses …..	5,992	14,709	22,428
Loss from operations …….	(4,906)	(8,874)	(11,606)
Interest income (expense), net ……	70	(68)	178
Net Loss …….	(4,836)	(8,942)	(11,428)

[3] As of April 1999, Agile Software was headquartered in San Jose, California, employing a total of 156 employees. Of this total, 37 were in engineering, 51 in sales and marketing, 46 in professional services (technical support and customer training), and 22 in finance and administration.

Exhibit 2: Representative List of Agile Customers

Datacom/Telecom Equipment
Alcatel Schweiz
Aspect Telecommunications
Brocade Communications Systems
Lucent Technologies
Nortel Networks
PairGain
Xircom

Computers and Peripherals
Diamond Multimedia Systems
Fujitsu Computer Products
Gateway
Hitachi
Iomega
Packard Bell

Medical Equipment
EndoSonics
GE Marquette Medical Systems
Guidant
Hologic
Humphrey Instruments
Visx

Electronics Manufacturing
EFTC
Flextronics International
Pemstar
Solectron
Xetel

Components
Advanced Micro Devices
Micron Technology
Reltec Communications
Texas Instruments
VLSI Technology

Semiconductor Equipment
Credence Systems
Electro-Scientific Industries
FSI International
Johnson Matthey Electronics
Strasbaugh

Consumer Electronics
3Com Palm Computing
Dolby Laboratories
Philips Mobile Computing
Scientific Atlanta
WebTV Networks

Exhibit 3: Location of Flextronics Plant in Zhuhai

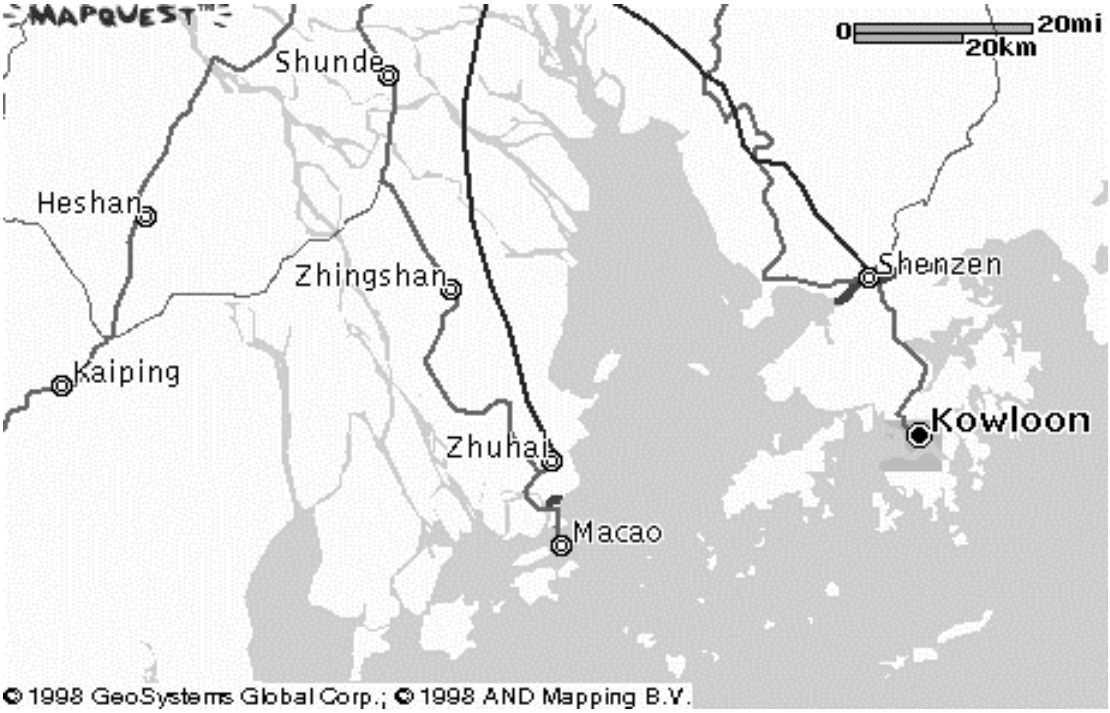

Exhibit 4: Agile Anywhere Product Offerings.