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**AGILE WEB PILOT PROGRAM
EXECUTIVE SUMMARY**



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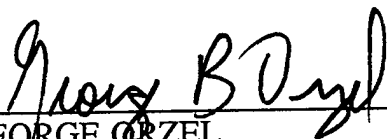
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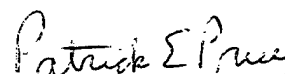
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Executive Summary

This report provides an overview of the Agile Web Pilot Program. The program formally began in January 1994 as an experiment in business collaboration among a group of manufacturing and design-related firms in eastern Pennsylvania. Funded jointly by The Federal Technology Reinvestment Project and the Commonwealth of Pennsylvania, the actual implementation of the program was initiated and led by the Northeast Tier Ben Franklin Technology Center (BFTC) in Bethlehem, Pennsylvania.

The Application of Agility

Responding to recent trends in industry, as encapsulated by the seminal work on agility, *21st Century Manufacturing Enterprise Strategy*, the BFTC staff outlined a plan to implement agile collaboration among a group of 15 to 20 firms located in Pennsylvania. Part Two, "Application of Agility" outlines the relevance of agility as seen by BFTC and lays out the projects' early goals. Part Two discusses recent supply-chain trends, and explains some of the new demands being placed on suppliers as a result of developments like increased outsourcing, mass customization, shortened product life-cycles, and various pressures arising from global competition. This section then goes on to explain how the BFTC proposed to explore issues in small-business collaboration to respond to recent industrial trends.

Based on their experiences in working with small and developing businesses in Eastern Pennsylvania, the BFTC saw the possibility of enhancing the competitiveness of small firms by enabling them to collaborate with other firms in the region. The BFTC chose to take a "whole-systems" approach to improving the supply-chain. BFTC staffers believed that exploring dramatically different ways of doing business could lead to the next level of collaboration throughout the entire supply-chain as opposed to incremental improvements in current business practices. Building on the recently articulated concepts of agile manufacturing, the BFTC set out to explore ways in which "virtual organizations" could provide optimal solutions for

customers and, thus, insure the competitiveness of the group of design- and manufacturing-related firms selected to participate in the project.

In setting up the project it quickly became apparent that getting the whole chain of customers and suppliers working together for a common goal presented the most important challenge. Learning more about each other, installing technology for rapid flexible communications, and beginning to align systems, led to additional business conducted in more or less traditional ways between the members. However, these efforts were not sufficient to motivate the kind of collaboration that enables high performance systems. For the suppliers, overcoming perceived risks of sharing insider knowledge and trusting their peers proved critical. With respect to the customer, the central task became one of helping the customer to embrace new ways of doing business, so that it could reap the benefits of the new and added value that Agile Web could provide. People-relationships and related issues, particularly getting people to think for the whole versus their own individual role, emerged as the biggest barrier to overcome. Consequently, these became the focus of the Agile Web Pilot Project.

While the project began as a loose consortium of suppliers and customers seeking to learn about and evaluate agility through actual business opportunities, it evolved into a formal corporate entity designed to compete in the marketplace. In addition to providing a single point of contact to facilitate long term customer relations, the resultant corporate form also introduced additional resources to the team to address strategic issues, which most tactically-oriented small businesses lack. Furthermore, the drive to create a business model that can flexibly and rapidly add resources fully integrated with the customer's needs and practices, served as the common goal around which all actions were taken. Customer feedback received during the course of the project has reinforced the advantages and viability of the overall Agile Web concept.

The Evolution of the Agile Web

The next section, "The Evolution of the Agile Web," provides a chronological retrospective of the entire project, and seeks to convey the thought processes and developments that drove the BFTC's changes in approach and the evolving organizational forms of the Agile Web. It describes the evolution from a loose consortium of companies working with the BFTC to

experiment with agile concepts, to a corporation with the goal of winning business in the marketplace through helping the customer to solve problems and optimize their products.

The project began with a number of knowledge and relationship building activities. In order to achieve effective collaboration among Small and Medium Enterprises, the BFTC team immediately recognized the importance of understanding the capabilities of the constituent members. CEO seminars were held to help the company leaders understand agility. Surveys were conducted to assess the participating companies' corporate strategies, products and services, capabilities, equipment, and quality. "Core-competency reviews" were undertaken to target ways in which the companies could come together in order to "cooperate to compete." The idea of selling core competencies was new to the Web participants, and thus the BFTC helped show them how they could see their individual organizations in new ways, focus on their core strengths, and, hence, add value for customers in new ways. Work on recognizing core-competencies also helped to reduce participants' fears of teaming and sharing of information, by helping them recognize that even companies in nominally similar industries have their own unique specialties and markets.

Other start-up activities included a series of meetings to help get the members to know one another and their individual styles. The group seemed receptive to the idea of putting aside individual objectives in favor of what was best for the entire group. But to realize the ultimate state of agile collaboration, we needed more work on developing a common vision of an integrated virtual enterprise and the types of commitment it would entail. Accordingly, we at the BFTC continually worked to develop trust across the membership from the beginning. We found that face-to-face contact in the context of real-world business settings works best to develop relationships.

Trust remained the most important issue. Members seemed hesitant to risk their reputation on Agile Web until it could be "debugged" and proven successful. Despite members' hesitation, trust did continue to grow. Some members, for instance, began working together in more traditional ways on "non-Web" projects. They also began sharing more sensitive information, as they observed the need to do so to provide the best response to particular customers.

Through the early Fall of 1994, none of our bids prepared for customers had yet moved into production, so we developed a simulation exercise to give the members some experience in issues related to working on a joint project. In response to the simulated customer, Web participants formed virtual organization, or "resource team," to produce and deliver the final product. In reviewing the results, we saw the importance of teaming for the best interest of the customer, sharing information, defining the process of making key decisions, and having a good interface with the customer.

In the first year of the pilot project, the idea of a "resource team" represented one of our most notable achievements. Comprising a subset of the Web companies appropriate for a given customer opportunity, the resource team would be pulled together by the BFTC to review an opportunity, and then develop the optimal solution for the customer. By participating on such teams, the members began to gain experience in working as cross-company teams. We were able to bid on real opportunities and to identify ways team members could work together to provide enhanced value to the customer.

As we moved into the second half of our first year, we entered a new phase in the project. It had become clear that the customers on the original pilot team were too concerned with internal issues to place real orders with suppliers they were not familiar with. Furthermore, responding to random RFQ's was not proving to be a good approach to developing new customers. We began to evaluate our experiences for clues to appropriate business opportunities. We concluded that it was not worthwhile to try to compete for customers who were interested only in lower price on individual components already sourced elsewhere. Because the value-add of the Web is more pertinent to the design stage of the product cycle, we decided our point of entry had to be with high-level engineering and design people. This critical decision to market the Agile Web, while it made the project far more challenging than originally conceived, allowed us to broaden our system-wide approach and test it more stringently in the competitive marketplace.

In the course of dealing with customers, we learned that customers really want a single point of contact in dealing with a group of suppliers. This led us to consider a more formal structure for the Agile Web. In order to maintain accountability, facilitate inter-firm communication, and monitor project management and quality, some more permanent entity

was required. The BFTC proposed a corporate entity that would provide all of these, as well as maintain a core-competencies database, select appropriate resource teams, perform strategic marketing and business development, and target new business practices and improvement activities across the Web, even after the end of the pilot-project phase. Through discussion with legal advisors, we also learned that a formal corporate structure, with the members as shareholders, would confine liability on a given project to only those members actually participating in it. For all these reasons, we chose to pursue a corporate structure immediately.

Based on the experiences of our first year, we developed a business plan to address marketing, organizational, and strategic concerns. This plan highlighted aspects of the Agile Web which would differentiate it from its competitors. Among the most important were the wide range of equipment, process capabilities, and knowledge the Web possessed, as well as its willingness to collaborate to provide the best solution for the customer. Beyond just the combined assets of the individual firm, Agile Web--as an entity-- would also be able to offer the agility of an ever-changing, dynamic virtual firm, while retaining a permanent structure for long-term partnering relationships between the customer and suppliers.

In response to the business plan, the Agile Web companies formed three teams to address Entity, Marketing, and Operational issues. The members led these efforts themselves. We found that their having direct control energized each group and the Web membership, as a whole. This shift from learning and experimentation to the creation of an entity signaled a new phase in the project.

Under the Entity team, the plan for the Agile Web corporation crystallized. Agile Web would be incorporated as a for-profit C-Corporation, with each member granted one share of voting stock for the nominal fee of one dollar per share. Profits from each project would be passed on to the participants, leaving the entity's taxable earnings at virtually nothing. Each member would be liable for only its own work as a contracted supplier on a specific job. Agile Web, Inc. would be a low-overhead operation with only a single employee, the Web President. Anti-trust, the role of the Board of Directors and the Web President were also dealt with.

In addition to developing the corporate approach, the Entity team also developed an Ethics statement to guide the day-to-day affairs of AWI. The team strongly felt this approach was more agile than attempts to anticipate all situations that might arise and address them

contractually. Although legally non-binding, the document represented a commitment from each company to deal fairly with one another and the customer. Relatedly, the team also agreed on a dispute-resolution process in advance, to head off potential misunderstandings down the road.

The Operations Team developed a customer-response process. According to the plan, the Web president would pre-qualify the opportunity and the customer, and then would select a resource team to put together a proposal. The purchase order would be between AWI and the customer, and a Virtual Organization Agreement (VOA) would delineate the internal division of work, and its terms, between AWI and the Web companies. A simulated bid-preparation scenario was conducted to assist legal counsel in preparing a draft VOA.

While our legal advisers worked on the VOA, we employed a quality consultant to assess the individual companies' and overall Web systems, and to develop policy and procedures manuals. Based on his assessments and a series of customer surveys, he then worked with the Web companies to develop individual quality improvement-plans.

The third of the three teams, the Marketing Team, worked to define the Agile Web and what it was trying to sell. In their deliberations, the team began to see the value of selling supply-chain management, as well as the opportunity for AWI in the area of new product development. We also learned that customers need to change their mindsets, as well. Agile Web cannot be fully effective if partnering with the customer is not possible. To get to the appropriate customers, we sought to target more visionary, senior management, and we prepared a brochure, press-releases, and a logo and tag-line to convey the precise message of what the Agile Web is, and what it has to offer.

After the formal incorporation of AWI in June 1995, our attention turned to the challenge of proactively procuring appropriate business. The Board took steps to hire a permanent President to replace the acting president, on loan from BFTC. To enable us to take on production contracts, we foresaw the need for proper support systems. To address communication issues, we had begun to explore the use of electronic commerce. We also developed a system that would provide the ability to access and update a common database for project management, video-conferencing, interactive white-boarding, and shared applications. To help the group get started with these tools, we organized training sessions.

Usage among the members, however, was spotty. The companies usually resorted to the traditional methods they were already using in their "normal" business.

As we moved into the second half of 1995, the number of customer inquiries increased significantly, thanks to the publicity we had generated through press-releases. And at that time, we secured our first production contract, to be performed for a supplier to the Tobyhanna Army Depot. On the commercial side, we saw some encouraging signs despite the small number of real orders. A customer informed us that the Web had taken months off its normal development cycle. We did, however, confront some difficulties. Poor inter-firm communications hampered our customer interactions, and reinforced the need for better communications both inside, and between, the Web companies.

As relationships among the members grew, however, they developed more and more trust and confidence in each other. For instance, Web members continued to increase the amount of business they undertook with each other, outside of Web projects. We also began to see an increase in the number of Web members who were bringing projects to the Web for bids. Several members began referring work to the Web, even though their own firms would have no role in the project. We recognized that this major shift signaled that the companies were beginning to focus on their customer's total needs, and were now seeing AWI as a way to address them.

Some of the CEOs of the member companies began to realize that, to be successful in the Web, they had to have the support of their employees. Agile collaboration would demand different tasks and new decision-making skills from their workers. As activities increased, we began to see more employee involvement, and also initiated several efforts to encourage this trend. We conducted a seminar on self-directed teams, and then formed a committee to research the training needs of Web companies seeking to develop agile workforces. By this point in the program, we understood that changing the culture within and between firms, and strengthening the ability of their workforces to collaborate, represented the key to unlocking the value of the Agile Web. We contracted with The Davison Group, who proposed an innovative way to use multi-media to capture the change process, and thus facilitate the cultural migration process. We also began activities within two Web companies to create agile workforces. One involved a series of facilitated meetings between management and the

workforce to uncover issues essential to achieving a collaborative work environment. The other consisted of a mission-development exercise, led by the BFTC. In both cases, we have seen very positive developments.

The year 1996 saw the arrival of Bill Adams as President of AWI. In one of his first efforts, Bill proposed "client-development" teams as a way of proactively developing long-term relationships with large companies *before* they made a specific customer request. Bill's attempts at business development in this way demonstrated the need for individual Web companies, not just the President, to be able to present the Agile Web as a seamless entity. It also brought into sharp relief the difficulties involved in so doing. Accordingly, the BFTC/Davison Group team held several training sessions to coach and prepare the company representatives to act in a manner consistent with the Agile Web's message. These exercises proved valuable.

Bill also improved the marketing approach of Agile Web by pointing out problems with our current approach. The Web had often pursued commodity part, low value-add, RFQs in order to get some business. Bill suggested that the Web should propose a Web-oriented, high value-add solution, and ignore commodity-only opportunities. Instead of chasing any and all business, the Web should focus on developing relationships with a few good prospective customers.

With regard to defense business, our limited industry experience (only two Web companies were experienced DoD suppliers) placed us at an early disadvantage. Nevertheless, in our limited interactions with the DoD, we concluded that in the absence of procurement procedures that allow more long-term and collaborative relationships, there is little value Agile Web can provide beyond that of an individual supplier. Recent contracting processes now being tried by some DoD entities may provide the needed flexibility. Additionally, we see possibilities in teaming with existing defense prime contractors, who have a greater opportunity to establish and maintain ongoing relationships with the DoD. By supporting the prime in its efforts, the Agile Web can thus bring added value to the defense industry.

As Bill Adams worked to foster long-term relationships with some large customers, our attorneys finished the draft of the VOA. The VOA defined the legal relationship between AWI and the participating companies for a given customer job. Customers expressed interest in this

document because it was designed to document the liabilities of the Web companies when working through AWI on a given project. To our surprise, the Web companies raised many objections to the VOA. While many expressed concerns about the penalties outlined in the VOA for non-performance, The Davison Group helped us realize that their claims were masking more profound issues. These issues drove to the heart of the project: namely, how would the companies really work together on joint projects? To address VOA issues, the companies set up a committee which explored operational issues in some detail and, ultimately, generated a set of "Operating Principles." The Operating Principles, agreed to by the full membership, provided a guideline to direct Web member-to-Web member, and Web-to-Customer activities. Interestingly, even after adoption of the principles, members inadvertently continued to violate them. Thinking for the whole proved to be much more difficult to implement than to talk about.

Work on Quality and Technology systems improvements continued through 1996. Web Quality Policy and Procedures Manuals were completed. With regard to technology, however, progress was less straight-forward. Despite training and constant encouragement, usage of electronic communications remained limited. Technical difficulties were not the key factor; rather, the members simply could not be induced to use it. The lack of real business orders provided little incentive to allocate time and money necessary to learn how to use the technology. Accordingly, we re-directed our resources to the more critical operational and marketing issues. We did develop a core-competency database that Bill Adams is using to keep track of, and search competencies within, the Web, but the companies are not utilizing this to any great extent. We, thus, have reason to doubt that virtual firms can be formed solely through the development of a large-scale core-competency database. First, trusting relationships need to be built to allow firms to rapidly come together to work on joint projects.

As the pilot project came to an official end by December 31, 1996, AWI needed to shore up its own finances in order to make the move to self-sufficiency. The Board of Directors came up with a new approach. They determined \$10,000 to be the minimum contribution necessary for each company to become a full-scale member in AWI. Members contributing at least this amount would receive voting shares in exchange. Original members could retain a relationship to AWI by keeping their initial \$1 share, but their voting influence would be insignificant.

Members could contribute more than the \$10,000, with the excess going to a form of non-voting shares which entitle the owner to additional portions of any future dividends. In response to this plan, about one half of the original membership pledged financial support. This new organizational structure represented another step in the commitment demonstrated by the membership, and AWI is now a self-sustaining organization.

The Agile Web is still a work in progress, but early customer response has been good. We are finding that the concept is new to customers, and there must be time spent educating them on how to use the Web's services. As for the pilot project itself, we have learned a great deal about the barriers and benefits of small business collaboration in an "agile web". Based on our lessons learned and mistakes made, we believe a similar group of businesses will not have to repeat the experiment that we carried out. On the contrary, they can build on what the Agile Web has learned and achieved as they begin their efforts. The final section of our report provides some recommendations for others trying to replicate or build upon our experiences.

Recommendations for Replication

The final section of the report summarizes the lessons learned by the BFTC during the course of the project that are particularly important for others attempting collaborative activities. The first recommendation, is to have a clear and common understanding of the goal that the group wants to achieve. There are many motivations for and forms of collaboration between businesses. Joint efforts at training, purchasing, or sharing information on specific topics can benefit the participants, but they will be limited in their accomplishments by their charter. Such narrow efforts require less risk on the part of the participants, but also offer less potential benefit.

A commonly shared business goal can provide the incentive to risk new approaches and thus tap new opportunities. Some related suggestions include:

- It is very important to choose the correct mix of companies for a given objective. A balance of different approaches and perspectives can enrich the outcome, but will complicate the teaming process. Make sure that, at a minimum, all the key perspectives (industry, long-term versus short-term, strategic versus tactical, etc.) are

present within the team somewhere, or the group may never consider important alternatives.

- The commitments required of participating firms should be rendered explicit up front, so there is no misunderstanding after the organization is formed and in operation. A well thought-out assessment of a potential member's *commitment*, as well as its capabilities, is highly recommended.
- It is essential to choose companies that have CEOs who, themselves, can look for opportunities beyond their own company's capabilities, and who will also encourage their employees to look for additional opportunities made possible through a web.

The building of trust and confidence was the key ingredient in the success of the Agile Web. Initial efforts and the choice of participants should be predicated in part on this fact. If participants do not have a history of working together, they will require time to sort out their relationships and build trust. Even if they have worked together in traditional ways, getting them to increase the trust and codependency among themselves will still require significant effort. Face-to-face experiences are most helpful in sizing up potential partners. Geographic proximity, for example, will facilitate trust-building.

A good first step in forming an organization is the development of a business plan. This exercise should focus the team on where it can add value to its customers, and what activities need to be done to accomplish its goals. The process of jointly creating a business plan can be very effective in establishing consensus on a common mission. We have found however that a common set of words can often be interpreted far differently by different companies and people. Thus, it is important to have sufficient discussion at a detailed enough level to insure a common understanding. Talking about specific scenarios and examples is a good way to get this understanding. Action oriented entrepreneurs will resist this, but bypassing this step will only cause problems later.

Some further related points are:

- During the formation and early operation of the organization, the companies need to take ownership of directing the entity and not remain passive or just reactive. Particularly where publicly supported entities are leading the charge, partially for their own objectives, companies must provide leadership or the effort will die over time.
- It is recommended that even if public funds are initially available, companies look ahead to the time when the funds expire, and form their initial organization with that in mind.

One of the more important and difficult tasks for a collaborative web is to have each of the participating companies and all of their employees present their joint group as a single, seamless entity rather than a collection of individual companies. Changing this viewpoint to allow and promote collaboration can be extremely challenging, and ignoring this pitfall can lead to continuing misunderstanding and a breakdown in trust.

- We recommend that considerable training and discussion occur on portraying the Web as a seamless entity prior to formally presenting the Web to a major customer. Again, role playing and discussion of scenarios can be very valuable.
- Pricing can be a difficult issue. If one member tries to take advantage by charging higher margins, the group process will break down. In the case of AWI, all members had pricing policies proven in the competitive marketplace outside the Web. They all agreed to offer the same pricing to the Web. The Web President sometimes negotiated beyond this in collaboration with the members. In some situations, participants must be willing to be price competitive, even if only marginally profitable, to get business and develop customer relationships, so that eventually they can move on to high value-added projects. Finally, participants should examine their internal cost assumptions that may not be valid in a collaborative project.

- The establishment of a collaborative mindset and trusting relationships provides the springboard to the next level of performance in the marketplace. Once that leap has been made, additional incremental, but significant, progress can be made by the development and application of tools that allow the collaborators to operate more efficiently.
- We would recommend that the organization perform an assessment of the quality and information systems for each company to determine what is already there, and to establish a minimum standard for all to meet. Document these systems and develop common guidelines.
- Technology should not drive the new business practices; rather, the reverse should be true. We recommend that the business plan and operating procedures be established first, and then technology be used to improve the effectiveness and efficiency of the new practices.
- Recognize that there will be start-up costs required to reap the rewards of working together and developing new markets and new customers.