



B2BiIT

A study of changes in building industry processes

Introduction

The B2BiIT management team sits comfortably around the high table in the lounge area of their Chicago office, a large sunny, informal meeting area that is indicative of the B2BiIT culture. Over a cup of coffee, they are quickly able to see the status of all their projects projected on three flat panel screens. A simple web interface reveals whether or not their customers are happy with a project's progress and the status of current issues, as well as cost, schedule, and safety updates for each project.

B2BiIT has seen the inefficiencies and high fragmentation of the construction industry as an opportunity for change. Tom Herskovits and John McLinden founded B2BiIT in 2000 to take a construction company to the next level by focusing on customer service. Through cultural change, supported by a technology platform, they have focused on being the project owner's advocate in the design and construction process. They view this as the means to change the inefficiency-laden building industry and deliver quality construction with major time and cost savings. To do this B2BiIT has developed many technology tools to enhance communication and collaboration throughout the design and construction process. Having received a positive response from project owners and architects, B2BiIT plans to continue to expand nationally, aiming to grow from a \$25 million to a \$1billion-plus company over the next five years.



Monitor shows real time project status

The B2BiIT management team in the lounge

Research Associate Monica Lynn Tovar and Doctoral Candidates Katie Cacace and Shiro Matsushima prepared this case under the supervision of Professor Spiro Pollalis as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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Company History

In 1993, John McLinden founded Contracting Resources, a Chicago-based general contracting firm. As a traditional construction firm, they completed a wide range of projects including corporate offices, industrial, retail, education and residential buildings. During his first year in business, John met Tom Herskovits.

Tom had always been a strong business leader, with a track record of running multi-billion dollar enterprises. He received a degree in Architecture and an MBA from Syracuse University. His leadership positions have included President of Post Cereals at General Foods, President of Kraft's Dairy/Frozen Business, and President/CEO of Specialty Foods. He met John McLinden while at Specialty Foods. John had volunteered to be a consultant for a week to evaluate the construction cost for Specialty Foods' new company headquarters. He was able to drive the price down from \$650,000 to \$500,000. Thankful for saving the company \$150,000, Tom offered John \$25,000 for his efforts; John refused the money. Over the next several years they participated in numerous real estate development projects. Tom funded the projects and John executed the construction.

During a development project of 39 homes in the suburbs of Chicago, they were able to reduce the cycle times of the homes significantly. The two often discussed building project performance and the inefficiencies in the building industry. At Kraft, Tom had been a leader in a total quality initiative that helped the company optimize its processes. This resulted in significant efficiency improvement. Both Tom and John foresaw the possibilities of creating a new company aimed to address these issues in the construction industry.

As Tom and John looked at their industry closely, they saw high fragmentation and big opportunities. Although the construction industry has annual revenues of over \$800 billion in the US, with 7% annual growth, the top 31 general contractors in the US account for only 4% of the industry. Productivity in the construction industry has actually dropped 19% in the US over the last 30 years, whereas the non-farm industries overall have seen a 45% productivity improvement.¹ Furthermore, \$140 billion a year of US construction costs are estimated to be due to delays and overruns.²

Tom and John identified many factors contributing to these inefficiencies: lack of trust among project participants; loose coordination among brokers, architects, contractors, and the customer; lack of process optimization; and poor material procurement practices. They felt that although technology could enhance efficiency and effectiveness, this resource was not widely used. The industry had not used technology to effectively plan and manage projects or to capture knowledge from past projects. They also felt that

¹ Source: US Department of Labor

² Source: *Engineering News Record*

ineffective human resources policies and practices often led to poorly motivated workforces. Overall, they felt the construction industry did not serve the best interest of the owner in many cases. There were typically poor identification of project needs early in the process and little responsibility and accountability for schedule, cost, and quality. The monitoring of projects was not systematic within the management system of most construction companies. In the end, the owner assumed responsibility for problems, inefficiencies, and risks. Many of these issues were identified based on comparisons with the manufacturing industry, and from Tom's 15 years of experience running major food businesses.

Tom and John also noted that there is no major force that leads to change within the project team. They were convinced that it is the project owner who has the decisive power to create change. By planning to reach and sell directly to the ultimate customer, becoming their advocate and sharing all information with them, Tom and John felt that a construction company could deliver significant incremental value. This change in industry culture would require a construction company to establish partnerships with developers, brokers and architects in order to market a team to owners.

After Tom had become a partner in Contracting Resources in early 2000, they set out to develop a new type of Construction Company and renamed it B2BiIT. They wanted to create a flexible, adaptable company that would address the lack of customer focus and inefficiencies in the construction industry, deliver quality construction, and major time and cost savings, and be fully accountable for project delivery. With a change in construction company culture, a diverse management team and technology support, they believed they could make this happen. The new name was meant to suggest something more akin to a technology company than a construction company. Despite the new name, they continued to work as Contracting Resources until they could fully demonstrate their new capabilities and processes. When they publicly changed the name of the company on June 13, 2001, it was more than a name change; it was the birth of a new company with a new way of doing business.

Building the team

"From the beginning, we have viewed building the right team as the critical factor in our long term success," Tom recalled. In early 2000 John and Tom concentrated on formulating the company's new business model and hire the right people to make B2BiIT successful. The senior management team did not carry over from Contracting Resources. In 1999 John had bought out his partner, who did not see the future of this new venture. Similarly, the head of operations and some project managers also left. One of the Contracting Resources individuals from the management side remained. Russell Head, who strongly supported the new vision of the company, was responsible for estimating and planning. Russ is now the Director of the Construction Planning Department.

In viewing the new company's objectives and the management structure that would be necessary, John and Tom identified the people needed as part of the core team. They wanted to incorporate a manufacturing approach, which pursued efficiency to gain competitive advantage within an industry. The first team members were selected out of this vision. Kirk Gundersen, hired as the President of the North American Material Distribution Company (NAMD), is a procurement and logistics expert with experience managing multiple distribution and warehousing operations. When asked the reason for joining the company, Kirk confidently states, "I've been a part of two revolutions (with Federal Express and Office Depot) this looked like revolution number 3!" Matt Sepe, an industrial engineer with 10 years of experience in the construction industry and an accomplished project manager, was hired as the Vice President of Operations in Boston. The Chief Financial Officer, Mary Palmer, had over 18 years of financial and administrative experience. Her background with a manufacturing company also gave her a deep understanding and appreciation of B2BiIT's approach.

Since another key area to be addressed in this new company was the use of information technology, B2BiIT needed a strong in-house technology person who understood the construction industry. They planned to build much of the cultural changes and new strategies on a technological platform that would facilitate planning and execution. After about a four-month search, they hired Chris Chapel as Vice President of Technology. Chris had been in the construction industry for 12 years and had developed sophisticated project control systems. "I went to a two-hour presentation on B2BiIT's Total Delivery System and I knew it was something I wanted to be involved in."

John actively pursued the last member of the core management team, as her expertise in the area of real estate was pivotal to B2BiIT's success in understanding their customer. "Getting Lori onto the team in early 2001 was really a coup," John recalls. Lori Brown was a successful real estate broker in Chicago with a national client base. Lori was named to Crain's Chicago Business' prestigious "40 Under 40" list of Chicago business leaders. Although she was identified early in 2000, Lori finally joined the team in early 2001 as the Executive Vice President with marketing and business development responsibilities. "This was an opportunity to work with some really great people to make a big difference in an industry where I saw significant opportunities for improvement," Lori comments. "It was about a very logical approach that I thought had huge potential." She brought to the team the point of view of the owner.

Industry Changes

The B2BiIT team strategy was to instill cultural change in the company and support the changes with new technology and tools to fully implement the new company model. Specific technology tools were identified that would be necessary to achieve the B2BiIT vision of revolutionizing the construction delivery process. The technology strategy was to create proprietary and patentable tools that would focus on optimizing processes utilizing existing technology when possible and creating in-house systems when

necessary. These technologies were then integrated under one system to support the company's goals. As Chris recalls, "We did evaluate using consultants originally to out-source technology development, but we felt it was critical that the technology tools were built with a 'hands-on approach' by people within the B2BiIT organization that understood the business. The other advantage of having in-house software developers is that we can modify and improve the systems on a moment's notice to adapt to our customers' or operational needs."

B2BiIT's web-based tools address issues up front, keeping all members of the project team, and specifically the customer, involved throughout the design and construction process. These tools include a customer needs definition process to aid in programming, a construction planning system for developing cost estimates and project schedules, a B2BiIT work plan to control and direct construction, and a procurement and logistics system to ensure lowest-possible-cost materials and just-in-time delivery. However, "It is not just the technology by itself" Lori adds. "One of the challenges, from my perspective, is that the technology is just so exciting that I find myself having to continue to remind people that B2BiIT actually does the work." The technology is valuable to help support industry changes envisioned by the company, but it does not necessarily create the change itself.

New Information Technology (IT)-enabled Processes

B2BiIT's goal is to revolutionize the design and construction process by significantly improving planning and execution. "Ultimately, we see a fully integrated architecture and construction process using technologies as the glue, to deliver a great building for our customers," according to John. To achieve this, B2BiIT developed a proprietary Delivery System to support the company culture and new processes. They want to create optimum solutions that identify customer needs and deliver high-quality construction faster and at a lower cost to the owner. Always keeping in mind how they tie in with a bigger picture: "We see ourselves as supporting the customers' business needs," states Lori.

B2BiIT believes the new openness of the entire design and construction process will help to establish high levels of trust in terms of accountability and accounting, and avoid industry practices of hidden costs, overruns, and delays. The owner sees actual costs that are guaranteed in conjunction with the schedule. B2BiIT is subject to financial penalties if timing is not met. B2BiIT is on the high end of the fee scale of the average 4-8% general contractor fee; this may be different around the country as this is very regional. But they consider the fee lower when compared to projects whose margins include a "hidden" profit.

Need Definition

When Tom was President of the Dairy and Frozen businesses at Kraft, he was involved in the building of a new headquarters. The design team for this project did not do a good job of identifying what his needs were. He felt that small details were not thought of early in the process. For example, he found out

toward the end of the project that a company store, with refrigerated and frozen cabinets, which he viewed as important to the culture of the department, was not included in the design. He also felt there was not an effective way to transmit critical business information to the designers, so that it would be taken into account as part of the design criteria. Now that he is a provider to customers, Tom uses his experience as an owner to identify how things could be improved in the design planning process.

B2BiIT believes that many inefficiencies in the building industry stem from poor definition of the customer's needs at the beginning of a project. The general lack of business planning in the initial stages can have a large impact on future schedules and workloads, as the design has to be reworked to meet function, budget, and time constraints that were not anticipated initially. John tells us, "We strongly believed that need definition, with regard to the broad business issues, was not being done particularly well. We set out to develop a better process and then create technologies that would enable us."

In 2000, the book Excellence by Design: Transforming Workplace and Work Practice³ inspired the B2BiIT team. This book was based on a four-year research project by the Space Organization Research Group of MIT's School of Architecture and Planning, exploring how to impact work processes through workspace. It describes how redesigning the workplace can improve the quality of production and the lives of workers.

They decided to approach two of the authors and ask for their assistance in developing a system to determine the customer's needs. In cooperation with authors Professor William Porter, former Dean of the School of Architecture and Planning at MIT, and Michael Joroff, Senior Lecturer at MIT, B2BiIT developed a system aimed at identifying the customer's key success factors and needs as well as the preferences of individuals within an organization. As William Porter recalls, "Our role was to edit what B2BiIT had been doing and talk about larger objectives of need definition, which Mike and I see not just as benefiting that moment in the process, but also being of lasting value if it is used by the client over time as a means to check how well the design and construction process is responding to the original program...the need definition process idea and instruments continue over time rather than being used once and thrown away."

The web-based Need Definition System™ (NDS) enables B2BiIT to quickly survey large numbers of employees or end users of a space, to reveal individual preferences, functional, and technology needs. The online survey has a simple interface that presents a set of questions that are customized for each project in order to identify the appropriate issues. Once the data is gathered, the information is aggregated and analyzed by B2BiIT and the resulting report is given to the design team.

³ By Turid Horgen, Michael Joroff, William Porter, and Donald Schön

The NDS can provide benefits for the owner by identifying their true needs. With this tool, B2BiIT can play an initiative role in identifying the project needs, a role that was previously assumed only by the architect or the owner. B2BiIT will license the NDS system to architectural firms who wish to develop specific questions and approaches for needs definition. For example, Lieber Cooper has plans to use this system to develop their own need definition approach specific to law firms. B2BiIT does not charge a license fee to the architects that they partner with for a project, and keep the architects' approach and questions confidential. Since B2BiIT hosts the survey and stores the data, this allows them to locate themselves in the center of the project. As John states, "By taking this approach we are also changing our relationship with the architectural community. Beyond the NDS we envision letting our architect partners utilize the Construction Planning System as they design."

Knowledge Management for Construction Planning

Once the initial needs of the customer are determined, B2BiIT believes the next critical step to successful project development is comprehensive planning. Conventionally, the construction documents prepared by the architect do not incorporate time, sequence or cost and do not include input from construction experts. Budgets and schedules developed during the planning stage are typically developed as "best guesses." During bidding, the architect's documents are then "interpreted" by contractors and tradespersons, requiring them to define many details without full knowledge of site conditions and potential problems. This leads to frequent need for redesign, corrections and change orders. "Most construction companies are task and execution-oriented. They really don't look upstream and don't integrate with the rest of the team early enough in the process," Russell comments.

To improve the industry standard processes, B2BiIT believes design and construction planning should be done in parallel. B2BiIT's ambition is to have no requests for information (RFIs) and no change orders in their projects, as these are often the result of issues that weren't addressed during the design process.

Following a manufacturing approach, B2BiIT believes that the construction process can be broken into assemblies. Even though each building is unique, each is built with individual assemblies that are repetitive and which can be categorized. B2BiIT has catalogued over 40,000 different assemblies, which allows them to translate any CAD plan into a series of assemblies. Within each assembly, knowledge is captured about materials required, optimal crew size, productivity rates and architectural details.

Assemblies serve as the common language within the B2BiIT Construction Planning System. B2BiIT has an in-house CAD team that can take 2D AutoCAD drawings prepared by architects and add intelligence to create a 4D (3D + time) intelligent model of "assemblies." This process typically takes about 4 to 5 days, similar to a conventional construction company's estimating process. The system then automatically

creates a detailed cost estimate, material list and labor allocation, as well as a schedule that optimizes the building process. This data is then used to create the B2BiIT Work Plan.

Information on labor and materials is retrieved from a “knowledge center” which includes data on time, cost and assembly sequence built on past experiences. Information from each project is added to the knowledge center and is maintained throughout all stages of the construction process: pre-construction, during, and post-construction. Management supports this knowledge center through the culture of B2BiIT by making it part of everyone's job to capture knowledge. As part of each employee's quarterly performance review, management measures how much data each employee has added to the knowledge center.

In addition to capturing and utilizing information from the knowledge center, B2BiIT is also identifying Subject Matter Experts (SME) who are B2BiIT employees, subcontractors or manufacturers. These parties take an active role in the design process to ensure construction feasibility. It is hoped that this involvement, that is typically “downstream” in the design and construction process, will help minimize the need for re-design during later phases of design and construction. “It is remarkable that the industry does not get direct input from experts early in the process,” says John.

For the owners and architects, this model provides a tool they can use to make changes and see the impact directly in terms of cost and schedule. The changes are made in real time with the B2BiIT team, and then the changes get sent to the 4D Model. As a result of this system B2BiIT is able to take full responsibility for quality and accuracy of all construction documents and to minimize risk.

The knowledge center and intelligent 4D model system are built using an object relational database management system (ORDBMS). Object oriented programming (OOP (VBA)) is used to connect MS Access with AutoCAD's DB Connect (Database Connect) utility. The DB Connect utility uses a relational database management system (RDBMS) to “Link” objects within the drawing to the corresponding database using the unique “Handle” for the object. The program is enhanced by using an SQL relational database to transfer information between AutoCAD and MS Access. This fully integrated system incorporates existing technology, such as AutoCAD for architectural drawings, Timberline for estimating, and Microsoft Project for scheduling, and allows for incorporation of new releases of this commercially available software. “The key to the whole system working is the integration, and we wanted to utilize applications which were easy to use and fully met our functionality needs,” Chris Chapel points out.

This process of building the intelligent model accommodates the existing practices of architects today, insuring B2BiIT's flexibility to use anyone's drawings. At present the architect in this process is not creating a 3D model; thus all changes to the model must go through the B2BiIT team. B2BiIT is currently

adding intelligence to architects' drawings. They intend to implement guidelines and standards to allow architects to create a document that can immediately link to the B2BiT Construction Planning System.

Construction Execution

B2BiT's strategy for job-site construction execution brings a number of elements utilized in a sophisticated manufacturing environment. The first is the use of three shifts whenever possible. The majority of the construction work takes place during the first and second shifts, and the third shift is used for pre-staging and catch-up work when required. While this approach has not yet been broadly implemented, unions, subcontractors, and tradesmen have received this structure of work shifts favorably.

Another manufacturing approach to the work site is daily schedule and work plan updates as well as just-in-time material delivery. These strategies are made possible by the intelligent 4D model of construction assemblies that outputs a detailed plan of work schedules as well as a material handling plan on a daily basis. Therefore, the field labor knows exactly the production approach and expectations for each work shift. The work is sequenced for optimal execution. For example, this system factors in the fact that painters need to remain on a project after the carpet installer and the movers to ensure that scuffs that naturally result from those processes are repaired. If the processes and sequencing become predictable, then actual work on site is very efficient and wasted time can be minimized.

Importantly, B2BiT is also trying to change the culture of the construction workplace and the treatment of all the workers. They strive to recognize the contributions of each person and emphasize the value of the team by encouraging team input and systematically acquiring it. The person in charge of the job site is called the "site manager" rather than the "superintendent." Unlike traditional construction sites, each B2BiT project has a trades lounge where lunch and coffee are offered to the workers. This lounge also serves as the place for communication between the management and the workers, and brings the goal of a satisfied customer to the workers by posting information from the project website on the walls. Each worker is able to know on a daily basis whether the owner is happy or not, and the reason why.

By changing the culture of the job site, B2BiT hopes to attract the best talent. They believe that a project's success is the result of a tangible team effort, and that belief is reflected on the jobsite. As a tangible indication of this belief, they distribute part of the "Customer Satisfaction Bonus" that B2BiT includes in their business model to those who participate in the project, if the bonus is awarded.

Material Procurement and Logistics

In evaluating the building industry's inefficiencies, Tom and John identified many problems in the area of procurement and logistics. They believe these problems include the number of parties involved in the

process, which can add up to 30% to the cost of materials. Traditionally, the procurement process goes from the general contractor to the subs, to distributors, to master distributors and finally to the manufacturers. Typically these parties do not have adequate systems to track material requirements and deliveries. This results in out-of-stock situations and job delays. As a continuation of the manufacturing approach embedded in B2BiIT's new design and construction strategy, they are creating links directly to manufacturers and controlling the supply chain.

Kirk Gundersen's background in logistics and purchasing has helped create a system that ensures that B2BiIT receives the lowest price for materials, provides just-in-time delivery at the project site, and encounters no out-of-stock situations. "It is the idea that we need to understand where in the pipeline the material is -- tracking all the way through the process, creating a closed loop, as opposed to the famous, 'Did you get my fax?'"

Given the complexity of the purchasing and logistics issues, B2BiIT created the separate, completely independent, North American Material Distribution Company (NAMD) to deal with the purchase, receipt, preassembly, site delivery, and staging of material. "Our purpose," Kirk continues, "is to provide customers the right building materials and control material delivery in order to enable on-time completion of the project. We have two advantages: cost and service. We try to purchase direct from the manufacturer where possible and use the knowledge of the supply network to get the best price for the customer. Then we ensure time definite delivery. NAMD is making alliances with suppliers, e-marketplace exchanges, and manufacturers to maximize efficiency in the supply chain.

Occupancy

The design and placement of furniture, fixture and equipment (FF&E) is planned at a very early stage of a B2BiIT project. This is initially enabled by the needs definition system during preliminary design, and is then refined in the final design stage. At this stage, the procurement is discussed directly with manufacturers or FF&E partners. Delivery and installation are monitored through the project website along with full-time on-site management.

In post-occupancy, the project website that was used initially for design and construction remains as a source of information for the owner, providing the catalogs of building equipment specifications, preventive maintenance information, and a guaranteed 24-hour response on all warranty issues.

Communication – Web Portal

From the beginning, John and Tom felt that effective communication was essential for effective planning and execution. B2BiIT created its own web-based approach to address this issue. The Project Web Portal provides customers with a real-time status of all aspects of the project. At a glance, the project

team is updated on project performance through five highly visual icons. These icons identify customer satisfaction, open issues, cost, schedule and safety. From that point, the user can drill down into a high level of detail. The system has built in metrics to track performance in each of those areas, as you drive deeper and deeper into the information. Customer satisfaction is measured by the owner's feedback through the site. Customers indicate a "happy" or "not happy" submission and indicate why. If a customer is unhappy, the CEO of B2BiIT and all others involved in the project know it instantly through email. All team members can post issues. As soon as one is posted, the system sends emails to the people responsible for the specific problem or question at hand. The schedule, costs and safety are updated constantly. The system will also incorporate a direct communication with a dedicated project manager. In case of problems, management can use the system to initiate work plans to resolve issues.

Using the B2BiIT system: GetThere Project

In the fourth quarter of 2000, Sabre, a leading provider of travel technology, had just finished building a new space for one of its business units. This new space of approximately 65,000 sq.ft. had been completed through the traditional design and construction process. Dean Sanderson, Vice President of Real Estate/Facility Operations for Sabre, had overseen the project. A month later he was to embark on a new project, almost identical in size and similar in design, for a newly acquired company, GetThere. A local Dallas contractor completed the first project. The design and construction process took 7 months and, although it was completed within acceptable cost and time requirements, Dean felt that the overall process could have been improved. Dean had learned of B2BiIT's new technology enabled approach and decided to hire them for the GetThere project. Ultimately, B2BiIT delivered the GetThere project 43% faster and provided 19% in cost savings in comparison to its virtually identical predecessor. "In addition to the time and cost savings, the most important benefit of B2BiIT's approach was that the final result met the needs of the users." said Dean Sanderson.

Compared to the new 450,000 sq.ft. Sabre headquarters Dean was also involved in, the new 65,000 sq.ft. office build out project was minor in scope. However, it was critical for Sabre to integrate an existing business unit with the recently acquired California-based company GetThere in a new location in Las Colinas, Texas. The resulting space would need to help shape the culture that the Sabre and GetThere management wanted to promote. The new GetThere headquarters needed to be completed in four months. This schedule allowed two months for architectural and engineering design, including the permitting process, and the remaining two months for construction.

John had worked with Sabre in the past with Contracting Resources, and had specifically worked with Dean Sanderson in Chicago on numerous projects. However, this project for GetThere would utilize the new B2BiIT design and construction strategy. Dean's previous project had a more traditional approach, starting with a programming meeting with the architects and using the traditional design-bid-build model.

For the GetThere project, B2BiIT would provide a turnkey operation for the owner and use the Need Definition System™, project web portal and an early version of the Construction Planning System™ to help eliminate planning and communication problems that had appeared in the previous project.

Part of Sabre's requirements included a need for real-time information. They required real-time design, cost and schedule information, something the traditional method of project delivery did not provide. Sabre feels that the ongoing project information was critical given that they are a fast-paced company that may need to change occupants, space, or people very quickly. "In an organization of our size, the end user's requirements and what their managers want to achieve often change during the project," Dean stated. "Another key thing is that, who knows, I may have to move them out and put someone else in there tomorrow."

In March 2001, Sabre and B2BiIT signed the construction contract agreement with the following scope of work: "Contractor agrees to provide at its own cost and expense all the labor, materials, equipment, machinery, tools, facilities, services, employee training and testing, scaffolding, hoisting facilities, shop drawings, storage and testing, security, transportation, disposal, the securing of all field dimensions necessary or required, cutting or parching of existing materials, notices, permits, documents, reports, and agreements and any other items necessary to timely and fully complete the work described in Exhibit "B" attached hereto in strict accordance with the contract documents." The scope of work included both the design and construction. The contract was originally set up with the understanding that B2BiIT was "not to exceed" an agreed-upon amount, which included a "Customer Satisfaction Bonus" that was to be included at the customer's discretion if the project was delivered to Sabre's complete satisfaction. B2BiIT would take on full risk for the project delivery.

After receiving the contract, B2BiIT assembled their project team. They hired the architectural firm of Lieber Cooper Associates and brought a team of 15 subcontractors on board. Most of the subcontractors had had no working history in the past with B2BiIT. However, B2BiIT investigated and evaluated available subs and determined who would best contribute to the success of the job. From the beginning, the B2BiIT management emphasized a team environment where all participants thought of themselves as being part of a collaborative unit.

The design of the new office space had to unite two companies with distinct cultures: GetThere was an Internet company with a very informal ambiance of free coffee/soda, while the owner company, Sabre, had a very structured, traditional, rules-based environment. B2BiIT believed that an office space that unified the needs and cultures of both companies could be found through the needs definition process. A needs definition questionnaire was developed in conjunction with the GetThere Human Resources Department and the project architects. Chris Chapel and his team at B2BiIT then created the forty-

question online “GetThere Employee Survey.” All 283 employees were emailed the link from their supervisors and were given five days to complete the survey. The B2BiIT system compiled the survey data in a report for the GetThere/Sabre management team as well as the architects. The report gave the GetThere/Sabre management team concrete information they could use in making future decisions about the design. They were able to think of what type of behavior and corporate culture they wanted to encourage based on their employees’ feedback. It provided an opportunity to discuss the real needs of the company, its mission, and the best workplace to accommodate it. The “needs definition report” served as a foundation for planning, the seed of design.

The needs definition report affected the design directly. Question Number 22 of the survey asked, “If you had an extra \$1.00 to spend on GetThere’s workplace, where would you spend it? Select one or more of the boxes in each column to indicate the amount you wish to spend.” The boxes provided the following options: “Upgraded individual work space, work surface, more storage, more flexibility, larger overall space, fitness center, collaborative work space, a café, plan space, more privacy, outdoor work space with connectivity, outdoor areas (dining, meeting, etc.), dedicated outdoor smoking areas, other.” In the employees responses, the largest amount of money was allocated to the fitness center, followed by upgraded individual work space. After receiving the report the team altered the initial concept design to reflect the employees’ response to this question by adding a fully equipped fitness center. Additionally, this needs definition process revealed that GetThere received very few visitors to its office. Therefore, the best architectural space, which had been intended to be the reception area by the base building developer, was probably not best used as the GetThere entrance. This two-story space was given back to the employees as a café, complete with indoor and outdoor spaces and game room. This created a “Town Center,” where people can interact in an informal way and also was a great place for the regular “all hands” meetings. This lively and functional space is the highlight of the design for employees.

The early needs definition also helped in expediting the design process to fit the tight schedule. By gaining a deeper understanding of the customer’s needs at the beginning of the process, time spent on the presentation of designs and materials was minimized. For design concept, the NDS helped identify the best solution early. Using a web portal to transmit electronic information for customer and team approval further accelerated the design process. Drawings were exchanged via email for the most part at the beginning of the process, and were later posted on the website for exchange with the engineering disciplines. Although electronic plans were reviewed regularly using the system’s “mark up” capabilities, ultimate owner approvals were given in just three face-to-face meetings, with the last one finalizing the design.

Dean likens the final design of the space to a dragster, lean and efficient; providing the most “bang for the buck” possible. The space has an “as found” loft character to it. There are no dropped ceilings,

revealing the building's structure of prime color steel and raw concrete walls. Due to the tight schedule, the materials that were used in the space, such as drywall and paint, were materials that could be acquired quickly. Carpeting was selected not only for aesthetic qualities but also for its availability. These scheduling requirements dictated that the design process be closely linked to procurement. Kirk Gundersen of NAMD worked with the customer, architect, and B2BiIT's construction planning group to confirm pricing and availability of each selected item. Each material purchased by NAMD was coordinated with the design and the site work and was incorporated into the overall project schedule to assure just-in-time delivery. To support the design and on-site work, Chris set up the first version of the B2BiIT project web portal for the GetThere project team to have access to real-time information as well as a collaboration platform. Although anyone on the project team could post issues through the project web portal, B2BiIT administered the site. All GetThere project participants were given login names and passwords to access information, exchange drawings and other files, and begin a knowledge database in connection to the project. The portal was also used to keep everyone informed of the project's progress, allowing easier management of variances within the schedule. The on-site manager provided a daily video synopsis of the job which was posted on the portal. Also, a webcam improved the communication on many different fronts. This camera can be controlled from the website, making it a remote tool to view the work being done. A snapshot off the webcam can also be sent to people on the team to point out details or problems. On one occasion "Kirk Gundersen had a hardware issue regarding a door -- he was able to zoom in, looked at the frame that was installed, and was able to answer the question himself," John recalls. Although the telephone was still an important communication tool for the project, people found that the portal was useful in fully understanding the status of the project.

The portal was also used to facilitate coordination among the project team. Tasks or "issues" were assigned and tracked. A "Dog House" was created to list those members of the team that did not take care of an issue by the deadline. People visited the portal often to make sure they were not the reasons for holdups in the project. At one time during the GetThere project, the owner was in the "Dog House" for not signing one of the contracts necessary to continue.

Dean Sanderson remarked that although he felt he was not actively involved in the project, he knew what was going on. Dean felt that uncertainties were cut out of the process, resulting in a significant cost and time savings on the project. Dean also said that the Need Definition System was critical in creating a successful design. At the end of the project, Sabre felt that B2BiIT had created a situation where all participants were working for the goal of making the best possible project to benefit the customer, and in doing so awarded B2BiIT the discretionary "Customer Satisfaction Bonus." B2BiIT is now starting on phase two of this project, using more advanced tools than in phase one. "I am looking forward to seeing how much more time and cost we can squeeze from phase two without any surprises," Dean Sanderson laughs.

The Company's Future

As Lori Brown summarizes, "we want to understand the customer and the customer's needs. That will make us a better service provider." Tom Herskovits adds, "I am very pleased with the progress we have made and the positive reinforcement we get every day regarding B2BiIT's unique construction delivery process. We are poised to do something very big in the industry and that gets me very excited. Going forward, I am certain that we will have many options for our business." Through their customer-centric business model, B2BiIT seeks to change roles in the building industry and in doing so identifies new opportunities for growth. How they manage that growth will be important to their future success. Their new design, construction strategies and tools have been used thus far on a specific project type, small renovation projects that require a fast pace. Now B2BiIT is planning to move to larger projects that are being built from the ground up.

In December 2001 B2BiIT was presented with a new possibility for growth. A joint venture general contractor team of Barton Mallow, Turner and Kenny Construction is renovating Soldier's Field in Chicago, a \$550 million project. Both Turner and Kenny contacted B2BiIT independently to explore using their project control system and portal on a high-profile project. As John McLinden mentioned, "we had our first presentation to a Turner representative, and he is now setting up a meeting with the Chicago Bears owner's representative in February 2002. Our potential role would be project controls utilizing B2BiIT's portal."

The management team sits around the high table and debates new opportunities, the flat screens flashing in the background. What would be the best way to move forward? They could sell their technology. They could choose to concentrate on specific areas, such as corporate interiors, schools, multi-unit retail, etc. that might lead to more projects with a focused set of customers. They could grow through acquisition by purchasing other construction companies and incorporating their technology and culture. They are in the process of setting up regional offices, but where will this lead? They have many options with their new business model, as Professor William Porter states: "Whether the business realization of that idea is to take the control of the entire value chain or to provide services that are strategically located in the value chain is an open issue. I don't think that they have come down on one side or other of the question, but the idea that they really deal with the owner from the point of view of trying to understand what the values are that the owner sees in the project, and to be the guardian of those all the way through, I think it is a very significant, worthwhile business position."