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E-Commerce and the Internet in Real Estate and Construction

Case Study: The Beck Group

Bringing DESTINI to Market:
Revolutionizing the Industry

INTRODUCTION

Pat Priest and Brad Phillips looked at the numbers in front of them, the software and hardware beside them, and the drawings and schedules on the wall before them. "The need is so clear and the tools are almost ready," Brad said, "But how do we finance their development so that we really CAN revolutionize the construction industry?"

"More than that," added Pat as she penciled over the numbers again, "how can we find a way to use these tools to increase our margins AND to generate the volume needed to recoup our investment in DESTINI?"

Pat Priest, the CFO of the Beck Group, was tasked with funding and managing the rollout of DESTINI. Brad Phillips, Director of Beck Technology, was the man who made it happen on the screens and on the field. Between them they had devoted years of their careers to the coding and deployment of this new idea.

They knew that they sat on an explosive technology that could change the way that buildings were planned, designed, and constructed; but they also knew that it would be risky and expensive to get there. They were sure that the other leaders of the Beck Group would also want to know how their business strategy would be defensible if it worked, and how they could reap the financial benefits commensurate with taking the risks.

Pat erased the whiteboard on the wall and they began to discuss their strategic and tactical options as they prepared for the upcoming Leadership meeting.

THE REAL ESTATE, DESIGN, AND CONSTRUCTION INDUSTRY

The real estate and construction industry is the largest industry in the world, representing over $4 trillion in value of construction put in place, or about 10% of global economic production. In the US, about $800 billion of construction was put in place each year, just under 25% of worldwide construction and about 8% of US GDP.

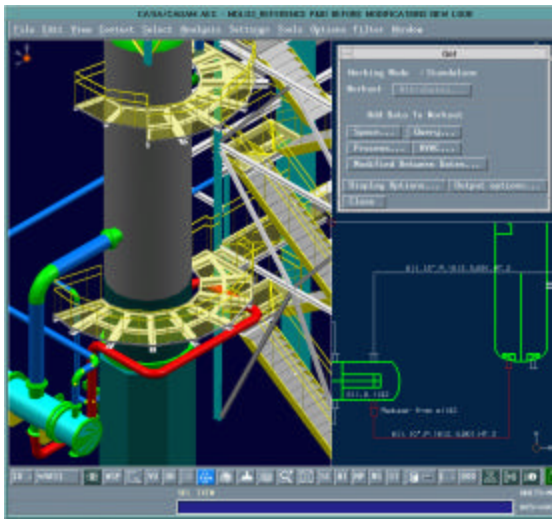
Of this, about 50% was in single family home construction, and the balance was in commercial buildings, infrastructure, and plants and factories. The purchasers of construction included government agencies, not for profit private institutions, publicly traded corporations, and privately held corporations and partnerships. Some purchasers of design and construction services occupied the spaces themselves, while others rented space to third party users. The US Department of Commerce kept statistics on the distribution of this work (See the attached exhibit and online information at: http://www.census.gov/pub/const), as did publications like ENR, a unit of McGraw-Hill Corporation http://www.enr.com

The industry was comprised of hundreds of thousands of individual companies providing every conceivable service from the manufacture of bricks to the provision of credit to the simulation of vibration and acoustics in mechanical equipment and concert halls. Most of the parties came together on a project basis working in a vast web of two-party contracts. There were few economies of scale, limited barriers to entry, and large communication problems characterizing almost all of the roles in the construction value system.

Communication was typically accomplished by use of paper drawings and written contracts and specifications. Firms typically were very careful about the risks and responsibilities they took on. A great deal of effort was spent in setting down and interpreting the meaning of these static, two dimensional representations. This was difficult to do well, since plants and buildings in the design and construction phase are dynamic entities being conceived and built in three dimensions.

As a consequence, the industry was characterized by low margins, high risk, and few real strategies for improving the situation. Addressing the issues of increasing margins through new ways of writing contracts or delivering work was an issue of high concern to leading CEOs of companies at all steps in the system.

3D SOLID MODELING AND RULE BASED DESIGN



In recent years, new technologies have arisen that promise to change this dynamic. In particular, object based design featuring 3D solids with intelligence that allows more efficient design and coordination have proven successful in the mechanical, automotive, and aviation markets. These tools ought to be able to provide value, reduce costs, and add efficiencies in the architecture and construction marketplace.

Why haven't they?

One response is that buildings are too hard to model. Unlike an automobile, which consists of a finite (albeit large) number of parts but for which tens of thousands of copies are made using a continuous process and longstanding vendor relationships, a building consists of an almost infinite list of parts and configurations, is only delivered once, and is delivered on a project basis drawing on a list of vendors with one-time relationships.

A second business obstacle is that unlike the automobile or cell phone or dishwasher markets, the firms in the value system tend not to have common rewards for reducing cost. Rather than designing for manufacturing benefit, for example, the designers are compensated based on least cost to accomplish the design, not least cost to build the design. What owner/operator client has the standing to adjust to this model?

This leads to a third possibility: that of greater integration of responsibility under one roof. This model holds that the economic savings are great, but can only be realized when the contractual obstacles are removed. The Beck Group committed to going down this path.

THE BECK GROUP

Traditionally a pure General Contractor, in recent years The Beck Group committed to being both an opportunistic provider of multiple services within the design and construction value system, as well as to test being an integrator of several services under one roof and one Owner contract. The exhibits articulate this business strategy in much more detail. Beck has invested in adding real estate development expertise, merged with an architecture firm, purchased exclusive rights to 3D object modeling software developed by Parametric Technology Corp (PTC) for the AEC market, and invested multiple millions of dollars in developing engineering and cost rules to help utilize the 3D model.

APPROPRIATING THE BENEFIT

One of the business questions now facing Pat Priest, Brad Phillips, and the rest of the Beck/ DESTINI team is, **how do we capture the benefits that should be generated from the use of an intelligent model within an integrated delivery team?** Will it be in reaping architectural fees? In winning more negotiated construction management work? In proposing for and winning lump sum design-build-finance work? What will happen to existing relationships with outside design firms? How big is the market for integrated delivery? How much money is saved, and who gets it? And finally, if the firm is successful in delivering radically improved value, how can that position be defended from imitators and how can it be expanded without taking unacceptable capital risks?

SUMMIT PARK

Summit Park is an example of the power of integrated design, construction, and financial power, coupled with a good match between buyer needs and supplier capabilities.

At Summit Park, the longtime Beck customer Southern Bearing Corp (SBC) had need of about 200,000 square feet of space. Another longtime Beck business partner, The Dallas Mutual Company (DMC), was interested in expanding its investment portfolio of office real estate occupied by AAA credit tenants. Based on the rent that SBC desired to pay, Beck's real estate arm was able to calculate a cash flow from the property that met DMC's desired rate of return on owned real estate. The problem, however, was that the building then needed to be designed and built and delivered for a price that also penciled into DMC's rate of return calculations, or else DMC would not commit in advance to buying the building and the deal would not go forward.

Enter DESTINI. Using DESTINI's ability to model and optimize structural and HVAC systems, to check solar gain for various orientations on the site, and to model from a select kit of structural, curtainwall, glass, and HVAC systems, the Beck team was able to design and show an acceptable building over the course of about 24 hours. This compared to a traditional design process that might have taken months.

24 hours after that, all of the key critical path items were on order, following design rules calculated in DESTINI and working with subcontractors and material suppliers who had been previously enlisted in helping to define the decision rules in DESTINI and in setting up price parameters.

The team saved about 4 months from inception to occupancy, based on traditional design methods. The team claimed savings of $120,000 on precast concrete alone between using pre-determined, pre-proven details and creating slack in the fabrication sequence that had economic value to the precaster. To illustrate another benefit, the Project Manager cited the ability to provide window sizes and quantities to the glass manufacturer on day one. This allowed the manufacturer to produce the glass and deliver it months earlier than normal. This facilitated an earlier "weather tight" date during construction, and this also contributed to the early completion date.

The business deal for The Beck Group called for the team to deliver the design and construction for a fixed price. These and other savings all accrued to Beck, which led to margins superior to a traditional architecture contract and traditional construction contract combined.

WHERE TO BEGIN?

The Beck team was concerned that the Summit project, while very successful, might have been an anomaly in that both the tenant and the buyer had previous long term relationships with Beck, and both were able to clearly explain their needs with the help of DESTINI and other documentation methods. Even so, the profit from this one project did not come close to amortizing the cost of continuing to develop DESTINI, never mind repay the costs already invested.

Pat Priest and Brad Phillips wondered how to take this experience and grow this aspect of what seemed like a lucrative business segment.

FINANCIAL CONSIDERATIONS

The financial issues were appealing and daunting at the same time. Ms. Priest and Mr. Phillips reviewed a study of generic office proformas and contractor financial ratios which had been prepared for an MIT class on "E-Commerce and the Internet in Real Estate and Construction." (exhibit attached). They wondered how the key points might apply to their circumstances.

First, they noted that a substantial savings in construction costs only translated to a minimal percentage gain in ROI for an investor. Would this be enough gain for these investors to justify taking a chance on a new delivery method?

Second, the study showed significant savings in several cost lines, similar to what might be anticipated in DESTINI if the Summit Park experience was applicable. Would they have to reveal and reduce design fees and general conditions, or would there be a chance to combine design fees, general conditions, and contractor fees into one lump sum line item where they could justify retaining the cost savings?

What about direct cost savings, for example in precast concrete, that might be generated by DESTINI - would Beck be able to retain those savings, or would the creation of savings be more of a sales tool for the selection of the team, with the benefit accruing to the Owner? Were there gains to be made in deploying online procurement tools or in playing a greater role in orchestrating supply chain collaboration?

Finally, looking far ahead on the MIT proformas, they noted that if the DESTINI initiative was wildly successful and the firm was able to double the amount of projects underway, then would they need to add capital to the business? If the MIT figures were

representative, revenue growth from $80mm to $160mm for the sample firm would require an added $5mm in net worth or capital at risk. Could that be justified, given the new risks? What would be the issues at The Beck Group in going from almost a billion dollar firm to two billion in annual revenue? Could they accomplish that growth taking on all that new work at risk? How would they need to ramp up their sales effort to win new projects with a novel approach? Alternatively, was there an opportunity to share and benefit from some of their knowledge gained, through a syndicate of other service providers?

THINKING ABOUT THE FUTURE

Pat and Brad reviewed their charge from Leadership. Upon reflecting on the past year, the Beck Leadership team had a lot to be both proud of and thankful for. Many of the internal efforts (like the Innovation Initiative and Beck University) were beginning to make a difference. The new, web-based Customer Assessments appeared to be well accepted by clients and the feedback was often very positive, but also insightful. Aside from several design and construction awards earned during the past year, Fortune Magazine honored the firm as one of the *100 Best Companies To Work For* in America. While 2000 profits were some of the best that the firm had ever experienced, initial projections for 2001 reflected at least a 30% reduction due to a number of projects being delayed or cancelled. As Leadership contemplated the future of the business, some of the following thoughts were repeatedly articulated:

- With the downturn in the equity markets clearly indicating a slowdown in the economy, should we continue investing over $2 million per year in our strategic opportunities (equating to 25% of our projected profit for 2001 assuming the downturn occurs)?
- Since there are so few integrated firms, no pure software house would be likely to invest in the additional costs required to develop rule-based technology given that the return on investment would be too small. At the same time, each integrated practitioner in the AEC and EPC space is often partial to its own set of business and design rules which is unlikely to be embraced by another. We did not seek to get into the software business, but what is our alternative if we must obtain the tools to radically improve the process?
- Should we explore outside investment? How would an investor's return justify their investment? What type of firm might be interested?
- Disruptive technologies are often slow to mature and begin life in low value-added spaces. Do we really want to be the first to do this?
- Is there anything here that might develop a revenue stream to sustain the required investment in our various initiatives? Is it a product, service, or both?

- Do we need to focus on:
  - Providing at risk planning, design, and construction at such volumes and margins that our own work repays the investment? What working capital would be needed in addition to the cost to develop software and rules?
  - Providing resources to other at risk designer builder developers who can utilize DESTINI/VIVA tools?
  - Partnering with a software or information company with established distribution channels who can help bring our work to market?
  - Syndicating the proprietary knowledge and rules developed in DESTINI to a group of qualified and trained at risk service providers who can leverage the tools and draw on their own capital base and project management talent?
  - Another idea to bring DESTINI ideas and investment to market, at scale?

They set about reviewing their mission, the business environment, the opportunities and threats, and in particular how to bring DESTINI to market in a defensible, scaleable manner. They knew that Leadership would be looking for solid thinking, clear articulation of strategies, and thoughtful recommendations for how to implement those strategies.

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