Delivering Successful Service and Outsourcing Projects Using Concurrent Engineering Methodologies

Michael G. Martin, PMP, Entex Information Services
Michael R. Weeks and Kevin J. Davis, United States Air Force Academy

Introduction

In recent years, the service sector has become an increasingly important part of the United States economy. In 1994, 71.5 percent of workers in the United States performed service jobs. This includes workers that perform service-related tasks for manufacturing concerns. This trend of an increasingly service-oriented economy has been steady since 1979. However, as the service-sector has grown, service-sector productivity has been stagnant (Van Biema and Greenwald 1997).

As the economy becomes more knowledge based, and therefore more service based, improvements in service productivity will become increasingly important. In order to improve productivity and lower costs, many companies in the information economy have moved to outsource their information technology (IT) resources. The theory of outsourcing has been that third parties have the knowledge base and the economies of scale to manage this noncore function of the corporation. Unfortunately, the results of outsourcing for many companies have been poor (Earl 1996). Costs have been greater than expected and service levels provided by the third parties have not been acceptable (Lacity, Willcocks, and Feeny 1996).

Most of the outsourcing literature (for examples, see: Cross 1995; Darling 1996; Earl 1996; Lacity, Willcocks, and Feeny 1995 and 1996) has focused on methods that companies can use to improve performance of outsourcing ventures (improved contracts, improved measurement tools, etc). This paper views the problem from the perspective of the service provider. What steps can be taken to improve customer satisfaction and lower costs? We propose that use of concurrent engineering methodologies, which have experienced success in the manufacturing (Thorpe 1995) industry, can increase performance of outsourcing organizations in the service sector as well.

Background in Concurrent Engineering

Joseph Cleetus of West Virginia University's Concurrent Engineering Research Center defines concurrent engineering as follows:

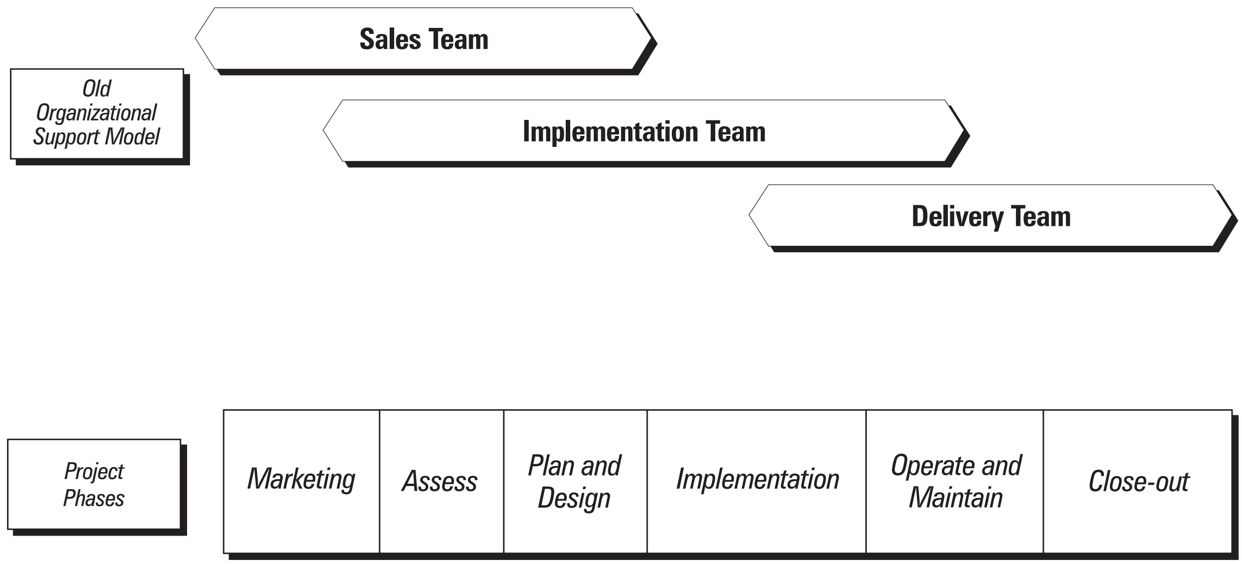
> Concurrent engineering is a systematic approach to the integrated development of a product and its related processes—from conception to disposal—that emphasizes response to customer expectations and embodies team values of cooperation, trust, and sharing in such a manner that decision making proceeds with large intervals of parallel working by all life-cycle perspectives, synchronized by comparatively brief exchanges to produce consensus (CERC Homepage 1998).

Concurrent engineering was conceived as a method of improving productivity and responsiveness in manufacturing operations. Eastman Kodak pioneered the process as a response to a new product introduction by one of its competitors, Fuji. To respond quickly to Fuji's introduction of the disposable camera, Kodak reengineered its development process to speed introduction of Kodak's version of the disposable camera to market. Rather than develop the product sequentially (or even in parallel with little communication), Kodak brought product designers, manufacturing engineers, and other members of the development effort together to work as an integrated team. The team succeeded in reducing the development process in half to thirty-eight weeks. The stunning results of this project gave rise to the popularity of concurrent engineering methods. Shortly thereafter the process was embraced by the automotive and aerospace industries (Hammer and Champy 1993; Leonard-Barton et al. 1994).

Current Delivery Techniques

Service providers are under extreme pressure today to provide services to the client quicker than ever before, particularly in the IT sector. This is due in part to the rapidly changing advances in both hardware and software products. To manage this ever-changing technology, a corporation must have a specialized workforce that is highly trained and can adapt to changes quickly (Pitt, Watson, and Kavan 1995). Corporations have found, however, that the IT part of their business is demanding so much time and money that they end up losing focus

Exhibit 1. Current Delivery Methodology for SAO Projects



on their core competencies. As such, many decide to outsource either part or all of their IT services in order to increase the management time available for their core business (Lacity, Willcocks, and Feeny 1996).

This creates both opportunities and challenges for the IT service providers. The opportunity, of course, being the explosive growth of the number of organizations outsourcing their non-core services. This rapid growth, however, does create new challenges. For example, expedited response and implementation of services, required by the client, often leads to project failure. Expediency leads to the lack of a clearly defined statement of work, which often results because of the lack of time to properly document the client's requirements and specifications (Standish Group 1995).

The current scenario for managing and implementing service and outsourcing (SAO) projects uses traditional project management techniques. Most project managers use a project life-cycle approach (Duncan 1996) and rely on project management checklists: clearly define the project objective; divide and subdivide the project scope into major pieces or work packages; define the specific activities in the form of a network diagram; etc. (Gido and Clements 1999). These traditional techniques lend themselves to sequential task-oriented thinking. These approaches also require each functional silo to focus strictly on its core competency or area of specialty, then throw the project "over-the-fence" or "over-the-wall" to the next group to complete its portion of the work.

This type of approach has benefits and costs. The benefits are: 1) a structured methodology for delivering a service or product, and 2) allowing the organization to respond very quickly to a client in a competitive bidding situation. The cost of this approach is that the expeditious response often involves only the sales organization and without any input from the subject matter experts (SME's), who will be a part of the implementation and delivery teams. This approach also tends to be very inflexible when changes are required or needed in the process. As such, it is very difficult to adjust to and implement changes requested by the client without going back through the entire process. In addition, the lack of the SME's involvement in the presales process often leads to the sales group making commitments to the client that cannot possibly be achieved. This may ultimately lead to project failure and lack of customer satisfaction.

To further illustrate this approach, let us look at a sample IT outsourcing project. A typical IT outsourcing project may have a life cycle, which consists of the following six phases: Marketing, Assessment, Planning and Design, Implementation, Operation and Maintenance, and Close-out (see Exhibit 1). The cycle may be initiated by the sales or marketing group responding to a request for proposal (RFP) from the client. Once the account has been won, the sales group will generally turn its focus toward generating additional business from the client or seeking new opportunities elsewhere. The delivery or implementation of products and services sold to the client then becomes the responsibility of the service integration or implementation team. After the service implementation team has fully implemented all services for the client, the project is then turned over to a group we will call the steady-state delivery team. This core group will then remain with the project throughout the contract period or until such time that the contract is terminated.

This approach has proved that it is neither an efficient nor a profitable methodology for managing projects. The Standish Group estimates that failed and challenged IT projects cost United States companies and government agencies an estimated $145 billion per year. In addition, it is estimated that ninety-four out of one hundred projects are eventually reactivated or reinitiated at a later date (Standish Group 1995).

Proposed Methodologies for Delivery

With the extreme pressure being applied to respond and implement services faster than ever before, service providers can no longer afford to perform work in a sequential manner. Organizations are finding that they are often well into the implementation phase of a project before they realize that commitments were made to the client that cannot possibly be met. One of the biggest problems facing project managers in the service sector is managing a project after his company's sales and marketing personnel have created unrealistic expectations. How often do you hear a sales or account representative complaining about the implementation or delivery team not being able to meet the schedule that she originally established with a customer? In fact, we should not just limit this complaint to the schedule but should extend it to the cost and scope of the project as well. There could be multiple reasons for the perceived substandard performance of an implementation group, including the lack of proper skill sets, acts of God, etc. Frequently, though, it is due to poor or improper communication between the sales and implementation teams. So how do we correct this recurring problem of successfully delivering what is sold? Do you convert the sales person to a project manager overseeing the life-cycle management of a project? Do you make the sales commission contingent upon successful project delivery or achievement of projected profit margins? These are all methods for improving the delivery of a project, but they are not likely to address the contracting challenges. We propose that by improving communications between the sales, implementation, and delivery teams, improvements will be dramatic, with more projects delivered successfully.

So, how do we improve communications and teamwork in a functional organization with very distinct functional boundaries? Particularly, how do we make these improvements in cases where an organization is very sales driven and firm in its established structure? One way of breaking down these barriers and improving communication and teamwork among functional groups is by using Concurrent Engineering (CE) methodologies. Doing tasks in parallel rather than sequentially is the basic premise behind concurrent engineering. The competitive edge gained by utilizing this methodology is the ability to deliver services more expeditiously and at a lower cost while still meeting the customer's expectations. CE methodologies do not eliminate the functional barriers but instead integrate the functional staffs into one cohesive team, which focuses on accomplishing the project on time, within budget, and in accordance with the customer's requirements. By integrating the functional experts into one team, changes that occur in the project's scope can be responded to immediately regardless of which phase the project is currently in. This added flexibility would help to ensure that the product or service delivered meets the customer's requirements and specifications.

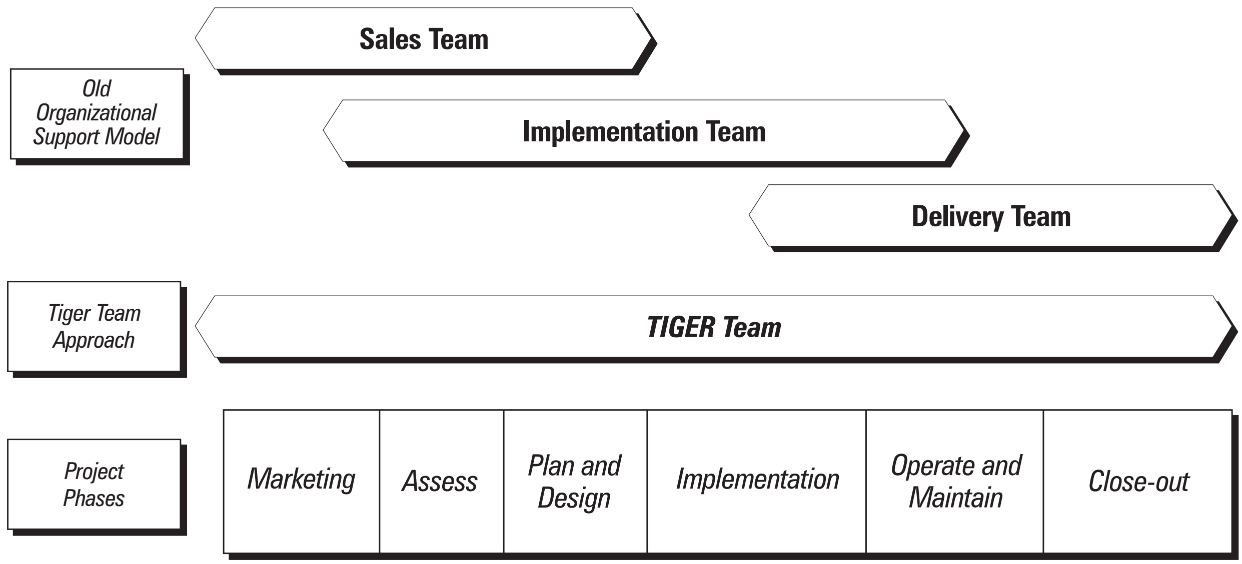
So, what does this "new, cohesive" project team look like? The team is comprised of subject matter experts (SMEs) from each functional discipline, with the project manager acting as the leader or director of the team. The integrated team concept allows the SMEs to pool their knowledge of requirements, processes, procedures, assumptions, constraints, and solutions. The Concurrent Engineering Research Center (CERC) refers to these highly integrated project teams as "tiger teams." CERC, however, did not provide a detailed definition of "tiger team." We, therefore, propose that the term "tiger" be expanded upon to better reflect the integration of expert resources into a single team. As such, it is submitted that the term TIGER be represented as an acronym for: Totally Integrated Groups of Expert Resources. A sample TIGER team for an IT total outsourcing project may include the following members: Project Manager, Account Manager (Sales), Help Desk SME, Network SME, Process Consultant, Reporting SME, Acquisition SME, Asset Management SME, and the customer (see Exhibit 2).

From an outsourcing perspective, it is imperative that the customer be part of the TIGER team. Without the interaction, participation, and support of a customer representative on the team, the probability of not capturing and meeting the customer's needs and expectations is greatly increased. Thus, to improve the probability of success, it is extremely important that the customer be represented on the team.

Organizational Structure Concerns

A TIGER team approach may require fundamental changes in a firm's overall structure. For example, we

Exhibit 2. Proposed Delivery Methodology



may have to reorganize as a hierarchy of teams or as a matrix reporting structure. A matrix structure would involve the various SMEs reporting to both a project manager and a functional area supervisor. Due to these fundamental organizational issues, top management support is crucial for successful implementation of this framework.

Hirschorn and Gilmore found that the internal boundaries of traditional corporations are normally aligned along functional lines. They warned that moving to a team environment requires a remapping of the traditional boundaries of the organization. Teams do not provide ready-made boundaries, especially when teams are short-lived, organic entities forming around particular projects. Management must be focused on the supervision of disparate teams, often to the exclusion of functional department oversight. To supervise teams adequately, management must be well versed in a variety of functional areas as well as the fundamentals of internal team dynamics (Hirschorn and Gilmore 1992).

Control Issues

Moving from a functional to a team structure also creates some daunting control obstacles, including pay and evaluation issues. For example, an organization that compensates its sales force via commissions may run into significant resistance. If a team is responsible for the project from the beginning, how will individuals from the sales force be compensated? Will all of the team members receive commissions for a successful project proposal?

Effective management of these human resource issues is especially critical since our vision of the teams, for these projects, is organic. That is, teams will grow and shrink as needed during the life cycle of the project. If a team needs more expertise in a given area, the team will find members to fill the identified need. Likewise, as a project progresses, teams may release members whose expertise is no longer needed.

That is the bad news about managing teams. The good news is that well-formed teams have remarkable powers to manage themselves. The control exerted by self-managed teams is much stronger than the control exerted by a typical hierarchical management structure. The values and norms of a team are more effective motivators, both positive and negative, than those constraints imposed by management (Barker 1993).

Is the TIGER team approach a panacea? Of course not. However, the ability to manage teams effectively can become a core competence of the corporation. An effective team-based organization can improve the quality of its deliverables whether they are products or services.

Implementation Strategies

Before concurrent engineering and the TIGER team approach can be implemented in an organization, several criteria must be met. First, the organization must have a proven sequential methodology for implementing and delivering projects. Before work can be performed in parallel it must first be designed and laid out sequentially. Once all of the sequential steps or activities have been captured, the organization can then determine which activities can be performed simultaneously. As the organization matures in the use of CE methodologies, the process will become more efficient.

Importantly, the roles and responsibilities of each TIGER team member must be clearly defined and understood by the entire team. This is to ensure that each member understands her role on the team, which improves coordination and reduces duplication of effort.

Implementation of a team-based structure will be a major change effort. Hence, initial implementation must be attempted on a small scale. After the TIGER team concept proves successful on a number of pilot projects, it will be more accepted by the organization as a whole.

Beyond the pilot project approach, other efforts must also be undertaken to enhance an organization's change readiness. Two aspects must be addressed to create readiness for change: discrepancy and efficacy. Discrepancy is about demonstrating that there is a problem that needs to be addressed. Publicizing weak profit margins or marginal customer service critiques can create a sense of discrepancy. The second part of the readiness equation is efficacy, that is: "How do we improve this situation?" It must be shown that TIGER teams will create better outcomes for the firm. Once the members of the organization realize that the status quo is not sufficient and see an effective strategy for improving operations, readiness for the change effort will have been created (Armenakis, Harris, Mossholder 1993).

Once a change-readiness effort has been undertaken and the TIGER team concept is ready for implementation throughout the organization, another issue will have to be addressed. These integrated teams will be resource intensive in an industry with chronic labor shortfalls. Due to these resource requirements, a TIGER team will not be suitable for smaller projects. A threshold will have to be established for TIGER team implementation. This threshold can be in dollars or another measure, such as seats supported in an IT outsourcing contract. For example, a hypothetical organization may decide that a TIGER team approach will not be used on projects that are less than $2 million or one thousand seats. By using a proper threshold, the firm ensures that personnel resources are not wasted using large TIGER teams for small projects.

Benefits of Concurrent Engineering

There are many benefits to applying concurrent engineering methodologies and TIGER teams to SAO projects. We expect the benefits identified to include:

- Services will more frequently meet the customer's requirements and specifications.
- Achievable service levels will be established.
- Customer satisfaction will increase.

Teamwork and partnering with the customer will be improved.

- Cycle time for implementing services will be shortened.
- Cost for implementing services will decrease.
- Probability of reactivating or reinitiating the project at a later date will be reduced.
- Revenue and profit margin will increase.
- Probability of project failure will be reduced.
- Employee retention will be improved.
- Flexibility to respond quickly to changes in the customer requirements will be improved.

It should be noted, however, that the CE methodology is not without fault. The one major problem with the methodology is that is does not allow room for error in contingency planning (Kerzner 1995). By including the implementation and delivery teams in the solution design of the project, you will, it is hoped, be compensating for the lack of contingency planning that may have otherwise been needed if the project work was being done sequentially.

Measurement and Assessment Instruments

The essential goal of the concurrent engineering initiative is to deliver and implement services in less time, at the highest possible quality, and with significantly reduced costs. The critical success factors for this initiative include (Pratt 1992):

- management commitment
- cross-functional teams (TIGER teams)
- computer-based support tools
- formal methods.

Before these new techniques are implemented, a measurement strategy should be adopted. The primary goals of the TIGER team approach are to improve both customer satisfaction and financial performance. Hence, we will need to agree on the measurement for each of these goals. Financial goals can normally be measured readily using traditional financial measurements. Unfortunately, the customer service benefits are more difficult to measure. We propose that the SERVQUAL survey be used. The SERVQUAL survey was developed in the marketing literature and has been applied to many different types of service organizations (Parasuraman, Zeithaml, and Berry 1985 and 1988). The SERVQUAL survey, which is widely debated in the MIS literature, measures customer expectations and perceptions (Van Dyke, Kappelman, and Prybutok 1997; Watson, Pitt, and Kavan 1997; Pitt, Watson, and

Kavan 1995 and 1997). We propose to use Kettinger and Lee's (1997) version of the survey to measure service quality. We hope to implement this system on a large scale in the near future and use the SERVQUAL survey to help measure success or failure.

Conclusions

As companies seek to outsource those functions that are not deemed a core competence, IT will increasingly be outsourced (Prahalad and Hamel 1990). As this trend develops, the outsourcing service industry will have to develop improved project management methods for initiating and managing contractual relationships. In this paper, we proposed an integrated method for delivering these projects using concurrent engineering methodologies. In our future research, we hope to implement this method on a large scale and use the SERVQUAL survey to evaluate the results.

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