

Program Management: A Framework for Collaboration

By: Russ Martinelli and Jim Waddell

Introduction

Scott Jones recently accepted a new position as Director of New Product Development with a company in the consumer electronics industry, and he found himself in a very different and complex environment. The new product line he assumed responsibility for has a highly distributed development model, where product design is performed at five sites, two in Europe, two in the U.S., and one in India. In addition, a major sub-assembly is developed and manufactured by a partner in Korea, integration and test is performed in the U.S., and final production is moving to China. This differs from his previous experience with his former employer, where product development and manufacturing were performed from cradle to grave at one site in the U.S.

Scott's predicament is not an isolated case. Companies continue to increase development complexity by employing alternative development approaches such as out-sourcing, off-shoring, open-sourcing and distributed development¹. However, many of the companies that have adopted these forms of distributed collaboration are struggling to manage the work that takes place globally and around the clock. This paper describes how some companies that have succeeded in the management of highly complex development efforts focus on three fundamental elements of their business: employing the right development model, establishing the right organizational structures, and building the right skills and competencies of its development leaders.

Complexity Rising

Our seemingly insatiable desire for ever-increasing wants drives our collective environment toward more challenging and complex ends. This is especially true for the products, services, and infrastructure capabilities we purchase and use. User demand for more customized solutions with highly integrated features is accelerating and creating problems for those managing the complex nature of the solution development efforts².

Development complexity manifests itself in several ways: the ability to integrate multiple technologies to meet end user desires is becoming increasingly challenging; the processes to manufacture the solutions are more complex; and development of the solutions requires a multi-discipline, multi-organization approach that many firms are not structured to implement, or do not have the management skills required to succeed.

Of course, management of complex development efforts is not new. Complex products such as commercial and military aircraft, satellites and their launch vehicles, and technological weapons have been in development for decades in the aerospace and defense industries. What *is* new today is that development of highly complex products is not isolated to the aerospace and defense industries, but common in all industries where technology development is the cornerstone for gaining competitive advantage.

The Right Development Model

Historically, the most effective approach for developing highly complex solutions has been to employ systems engineering techniques. A system is defined as *a combination of parts that function as an integrated whole*³. Each part by itself is of little or no value, value is only created in the interaction with the other parts to perform the function of the whole system. A *complex* system is one that has many components and multiple technologies that are highly interactive with one another⁴. They are interactive

in such a way that it is difficult to completely separate one part from another. The systems approach is effective in managing complexity because it involves breaking the complex system into smaller, more manageable subsystems (Figure 1), concurrently developing the subsystems, and then recomposing the system into a coherent solution within an existing architecture⁵.

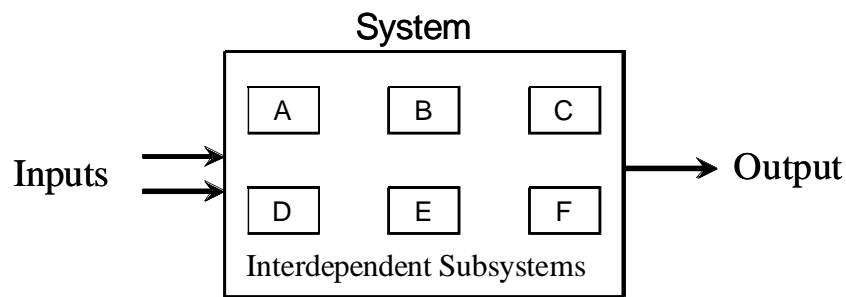
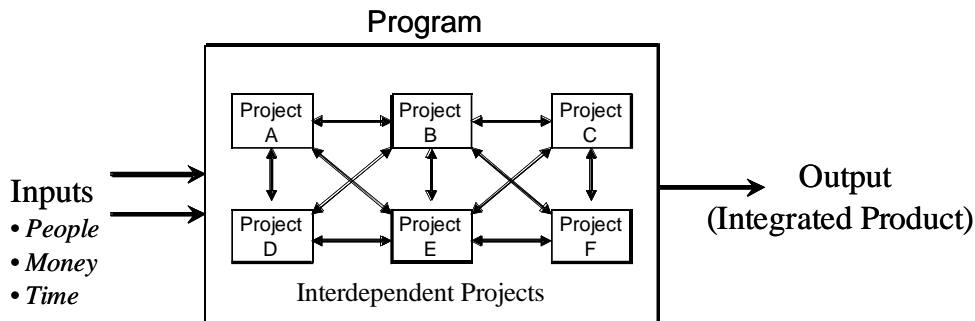


Figure 1: System elements

With the advent of the systems approach to breaking complex development efforts into more manageable elements, program management was developed as the management corollary to systems engineering to reintegrate the subsystems into a whole solution. Program management is a horizontal management model that facilitates a high degree of cross-discipline collaboration. As illustrated in Figure 2, the subsystems are organized and managed as interdependent projects within the program, and are lead by discipline-specific project managers. Therefore, the development program consists of multiple interdependent projects that are managed collaboratively and synchronized over time by a program manager and his or her project managers.



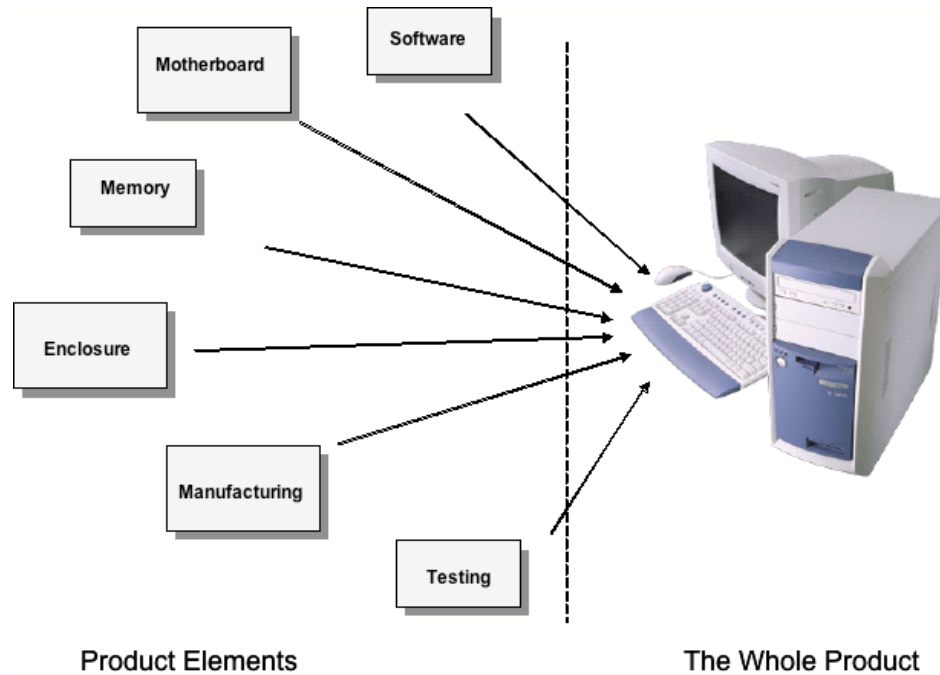
Source: Program Management for Improved Business Results

Figure 2: Subsystems configured as projects within a program

A common, universally accepted definition of program management does not exist. If you research the definition via multiple sources, you'll most likely come away with somewhat different definitions, similar in some aspects, and different in others. We define program management as *“The coordinated management of interdependent projects over a finite period of time to achieve a set of business goals”*⁶. Although all projects and programs deliver the tactical and operational deliverables, the real power of program management is the integration and management of highly interdependent projects to deliver an integrated product, service or infrastructure capability that contributes to the achievement of a company's strategic objectives and desired business results.

For example, let's consider a computer development program at Intel Corporation. The program manager's responsibility is to deliver the holistic solution, what we call the *whole product*, to the

market. In order to do this, development of the product is broken into multiple elements as defined by the product architecture. Figure 3 is a simplified illustration of this concept – other elements normally involved in the development of a computer product are not shown for sake of simplicity.



Source: Program Management for Improved Business Results

Figure 3: The whole computer product example

Each of the six elements of the personal computer shown is organized as a project consisting of a team of specialists in the domain they represent, and lead by a project manager. The job of each project team is focused and tactical: plan, develop its respective element of the whole product and deliver it to the other members of the program team.

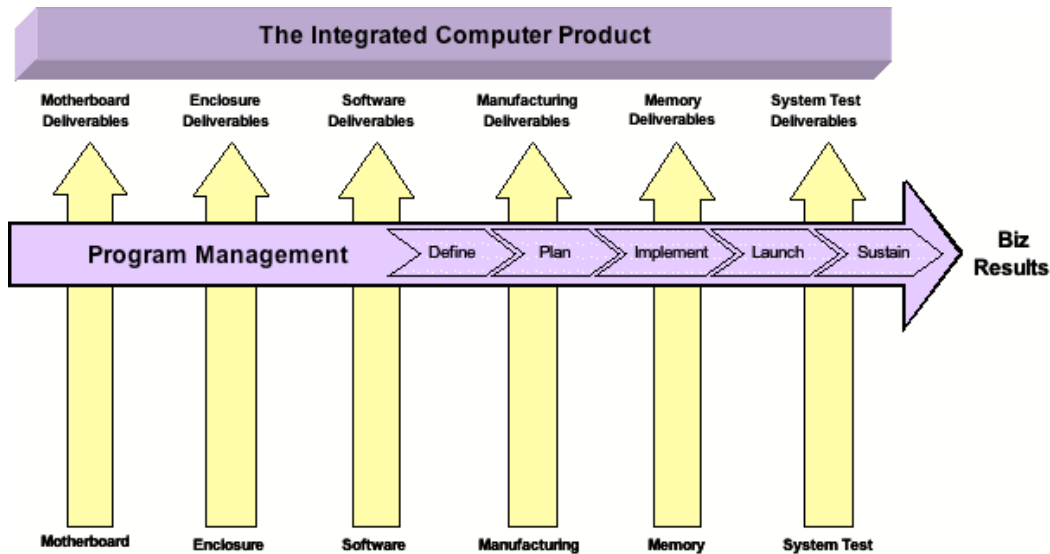
The program manager in turn leads the development program, and is responsible for integrating the elements into a whole product and delivering it to the customers and stakeholders. In addition to delivery of the product, the program manager is responsible for the achievement of the business objectives for which the product development effort was initiated, such as increased revenue, market share growth, and technology leadership⁷.

The Right Organizational Structures

For the program management development model to be effective, organizational and team structures need to be put in place to facilitate the cross-discipline, cross-project collaboration that is at the heart of program management. Thomas L. Friedman describes the need for effective collaboration best in his book titled The World is Flat, in which he writes the following⁸.

*“The best companies are the best **collaborators**. In the flat world, more and more business will be done through collaborations with and between companies for a very simple reason: The next layers of value creation are becoming so **complex** that no single firm, or department [within a firm], is going to be able to master them alone.”*

The scenario described in the introduction of this paper presents a real-world example of Mr. Friedman’s assertion. In order to continuously create value for itself and its customers, the company is riding the wave of rising product, process and business complexity. In doing so, older methods of product, service and infrastructure development become inadequate, and new methods need to be employed in order to succeed. Program management is an excellent option due to the fact that it is a horizontal management model in which the work of the program manager cuts across the project teams within a program, and drives the cross-project connection and collaboration required, as illustrated in Figure 4.



Source: Program Management for Improved Business Results

Figure 4: The cross-project nature of program management

The elements shown in the vertical dimension of the figure are the six projects that make up the computer development program example described previously. The program management function not only cuts across the various projects that make up the program, it cuts across the functional organizations within which the project teams normally reside. This focuses the functional organizations involved in product, service or infrastructure development within a company on a common goal – the successful development, delivery and support of the computer product, and ultimately the achievement of the business results anticipated⁹.

As Figure 4 illustrates, the business results are delivered through the program management function, not through the functional silos. Therefore, an organizational structure must be implemented that breaks down the functional silos to ensure that the functional organizations support the program needs first – in the form of people, knowledge, skills and technologies – and their respective department objectives second. The matrix structure has shown to be effective for the program management development model. However, to make the matrix structure work, a redistribution of empowerment and decision rights from the functional managers to the program manager has to take place to create an alignment between the program manager’s responsibility and his or her level of authority¹⁰.

In addition to changes in organizational structure, changes in team structure may be necessary to gain the highest level of cross-discipline collaboration. The program core team (PCT) is the most common team structure used in organizations that employ the program management model. The PCT is the cross-discipline, cross-project leadership and decision-making body responsible for ensuring that the program and business objectives are achieved¹¹. The size of the core team is dependent upon the number of elements making up the item under development, but typically the size varies between four to

twelve members. To illustrate, Figure 5 shows the full PCT for the Intel computer development program discussed previously.

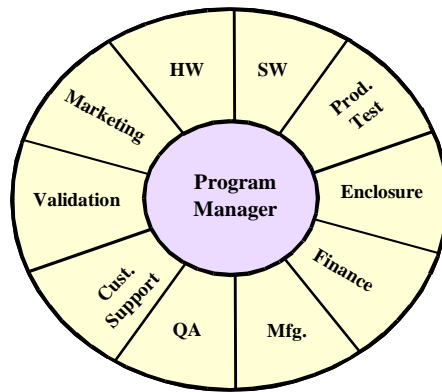
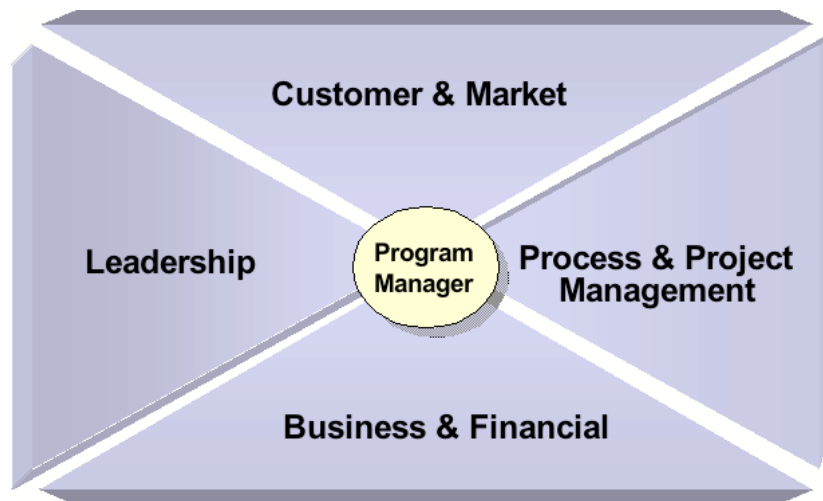


Figure 5: Computer development program core team

The core team structure establishes strong interdependent relationships between the program manager, project teams, and support organizations (such as quality and finance) that sit on the team. The PCT structure is highly integrated, meaning there is joint consideration of trade-offs, decisions, and problem resolution. The PCT must become a very tight and cohesive team that has a shared responsibility for the success of the overall program.

The Right Skills and Competencies

Within the program management development model, the program manager serves as the catalyst for converting business strategy into reality by leading the development of the product, service or infrastructure capability. This responsibility requires a program manager to have a broad skill set that is similar in nature to a business unit general manager. Figure 6 illustrates the four competency areas in which the program manager must become competent and proficient – Customer and Market, Business and Financial, Process and Project Management, and Leadership.



Source: Program Management for Improved Business Results

Figure 6: The Program Management Competency Model™

Arguably, the most important skills for a program manager to develop (and some of the toughest to

obtain) are collaboration skills, which are a part of the Leadership competency area. Collaboration skills consist of three primary types – synthesizing skills, emotional intelligence skills, and communication skills. Synthesizing skills allow the program manager to work across the various disciplines involved on a program, obtain balance and synergy between the project teams and functional organizations, and focus on the big picture while reintegrating the elements of the program output. According to Daniel Pink, author of the highly recognized book titled *A Whole New Mind*¹², “*seeing the big picture is fast becoming a killer aptitude in business. More and more employers are looking for people who possess this capability*”.

Since program managers normally work in an environment where the team does not report directly to them, emotional intelligence skills are critically important for leading the development team. Emotional intelligence skills involve the following¹³:

- Self awareness: Recognizing and understanding the moods and emotions of themselves and others
- Self regulation: Developing trustworthiness, integrity, and the ability to deal with ambiguity and change
- Motivation: Maintaining a high level of persistence in pursuing and obtaining goals
- Empathy: The ability to understand and appropriately react to the needs of others
- Social skills: Establishing a proficiency in managing human relationships, building rapport, and creating an effective human network

Since the program manager is the primary voice for a program, he or she needs to be very proficient in communication skills. This includes basic skills such as effective writing and speaking, but also includes the ability to listen actively and understand non-verbal communication queues. Many times a program manager needs to serve as the unofficial interpreter between two individuals on a program that are having difficulty communicating due to cultural or functional differences (ever witness a conversation between a marketing strategist and engineer?). In order to properly synthesize and feed back the message, the program manager must be able to listen intently. As well, much of our communication comes in the form of non-verbal body language which a program manager needs to be aware of and be able to interpret to understand the full intent behind one’s words.

It should be pointed out that it is a rare program manager that comes into the role totally qualified to fulfill all aspects of such a broad and encompassing set of skills and competencies. The successful program manager is constantly seeking to learn and broaden his or her knowledge and experience in order to take on more complex and important programs. Senior management in turn needs to create a positive learning environment to encourage their program managers to continually seek improvement and growth.

Summary

Scott Jones is indeed in a difficult position. Like many others today, he finds himself in a business environment that is becoming exceedingly complex due to stringent end-user demands and the increase in global development models. As a result, conventional ways of developing products, services and infrastructure capabilities are no longer effective. Fortunately we don’t have to reinvent our engineering and management approaches, but rather look to other industries and companies that have solved the same problems in the past using highly collaborative solutions. The keys to their success has been to adopt the right development model that minimizes complexity and maximizes cross-organizational collaboration, establish the right organization structures that support the development model, and develop the right skills and competencies in the people leading the development efforts.

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