

# ENTERPRISE INTEGRATION FOR VALUE CREATION IN AN ORGANIZATION

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## ABSTRACT:

In day to day's competitive and dynamic business environment. The complexity of the technology is increasing in the applications in the industries. A new system is required to maintain the competitive advantage of the industries. Increasingly successful business leaders recognize that the integration of management and organization and facilities is the key to inspiring organizational performance and value creation.

Three of the primary resources namely people, place and tools are to integrate as a coherent whole and aligned to support a robust strategy. The new frontier of Knowledge Worker effectiveness lies in integrating the design and implementation of these three keys.

The Industries have begun to integrate their operations along the value chain of the products they design, produce or sustain. The creation of the value is one of the important tasks in Integration. The object of meeting the technical performance and the costs and scheduled goals effectively and efficiently is a serious challenge. Hence, the process of integration to the enterprises can achieve the target. The nature of enterprises provides a solution for obtaining these challenges. Enterprise Integration is the process of linking these applications and creating a linkage between the different sources is an important aspect.

Information is the consideration as the most important factor for implementation of integration in the enterprise. The second step takes place in close interaction between the customer and the supplier. The customer is to integrate into the value creation of the supplier. Value is the mutual creation among the factors on different levels. Customer integration is to define as a form of industrial value creation where the consumers take part in activities and processes, which is the domain of the companies.

The current practice of Enterprise Architecting has been a significant contribution to creating and sustaining modern enterprises. However, the current field is not a sufficient approach to the enterprises of this new century. A broader and more holistic approach is to achieve by drawing on the emerging systems and the architecting field.

The objective of this paper is to set a framework for value generation in the enterprise based on a strong integration of the customer. The main part of the paper will explore customer integration.

**Keywords:** Enterprise, Integration, Architecture, Value Creation, Lean, Stake Holders.

## 1. Introduction:

Companies have to adopt strategies, which embrace both cost efficiency and a closer reaction to customers' needs. The customer is a concern as the partner in value creation. The customer is to integrate in the value creation of the supplier. Customer-related value added is to produce at the information level. The mechanism for interacting with the customer and obtaining specific information in order to define and translate the customer's needs and desires into a concrete product specification.

The costs arising from customization consist largely of information costs. The customer is to integrate in the value creation of the supplier. Every transaction implies information and coordination about the customer specific product design. It is the base on a direct communication between the customer and supplier. Industrial value production is most often conceptual in terms of the value chain.

In this concept, value creation is sequential. Value is to add from one-step to the other. The customer is not a part of the value chain. Value is the consideration only in the transaction between the customer and producer. The large-scale projects often have high complexity. They have significant technical risks, and a large number of diverse stakeholders. This environment is challenging for the effective and efficient execution. The objective of this discussion is to set a framework for value generation in the enterprise based on a strong integration of the customer.

## 2. Enterprise:

Black's Law Dictionary defines an enterprise as "an organization united by a common purpose," focusing on a common purpose as the defining element of an enterprise. The term "Enterprise" refers to the Inter-organizational network. The coalition of different department as a whole is an enterprise. The interconnectivity existing between the different departments is well defined. It contributes to the development and the delivery of a system [1].

The Enterprise consists of distributed responsibility and leadership. They have stakeholders with both common and diverse interests. This common purpose as *creating value*, says that an enterprise "is an integrated entity that efficiently creates value for its multiple stakeholders".

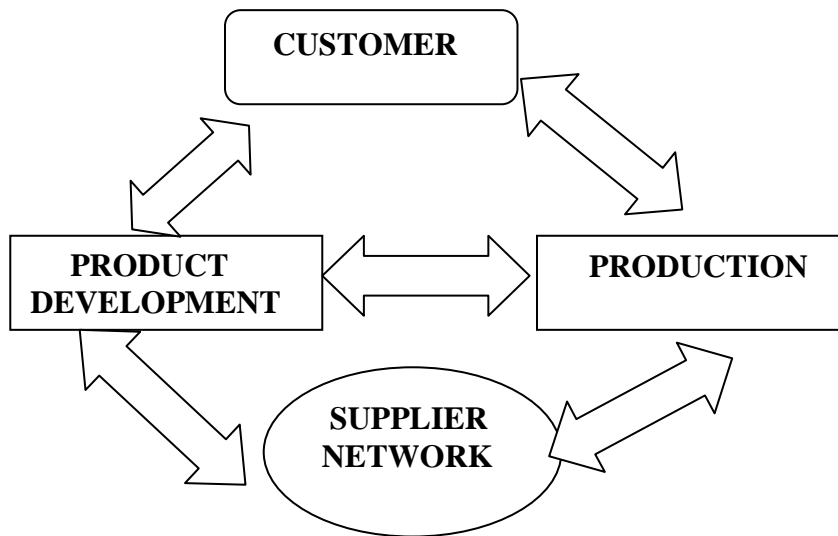
In the realm of business enterprises, an enterprise is often analogous to a traditional firm. As firms, grow in size and scope. The boundaries are into consideration in an enterprise. A single business unit of a larger firm is an enterprise, as it is the unity in a common purpose of creating value. The enterprise concept can have extension upwards a level to include other business units of the same firm that also meets the definition of an enterprise. As long as it continues to meet the definition, the level is drawing higher to include allied firms and even industries [1].

### 3. Integration:

Integration is the making up or composition of a whole by adding together or combining the separate parts or elements combination into an integral whole. The term Integration refers to the bringing together of two entities in such a way that unites and coordinates not only their computing resources, but also their strategies, processes, and organization. This is so that the integrated enterprise behaves as a coherent entity.

Integration plays an important role for enterprise networks. The enterprise integration can quickly multiply in several directions in the face of growing technological as well as organizational complexity. Enterprise Integration deals with the face of the accelerating rates of technological change [1].

Over the past decade, many enterprises have struggled to achieve the promised benefits of achieving greater integration internally. By facing efficiency, gains that have failed to materialize. The process is to overcome the internal resistance to the adoption of new technologies. This process has been the crux of the problem. This method of preventing enterprise networks from achieving a higher level of performance in their respective market segments [1].



**Figure 1: The customer and supplier network in the value chain [2].**

#### 4. The Five Lean Fundamentals:

1. **Specify Value:** This is the first stage in the implication of lean integration. The basic task is to generate value for the product. The customer generally does the value specification. The process involved is the “pull” system [2].
2. **Identify the Value Stream:** The products require the system of streaming the process. This streaming of information or the process cycle is a principle of lean. The mapping of the end-to-end linked resources is applied. The inputs and outputs are to identify to eliminate waste [2].
3. **Flow continuously:** The process involves flow. The streaming should be continuous. Thus by the elimination of waste in the process the value creating steps flow [2].
4. **Pull system:** The Customer determines the value of a product. This system is the pull system. The customers pull cascades to the lowest level supplier enabling just in time production [2].
5. **Pursue Perfection:** A process is perfect through the gradual improvement. This is the application to any product. In order to achieve the perfection a continuous modifications is required. [2].

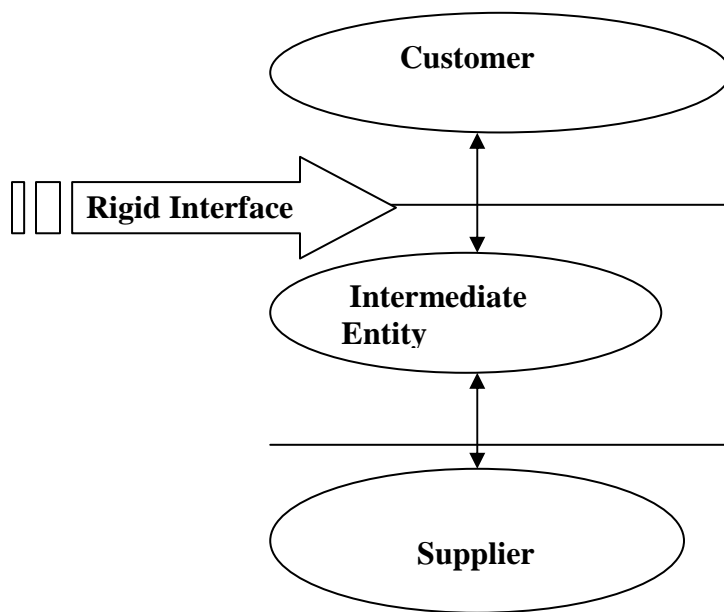
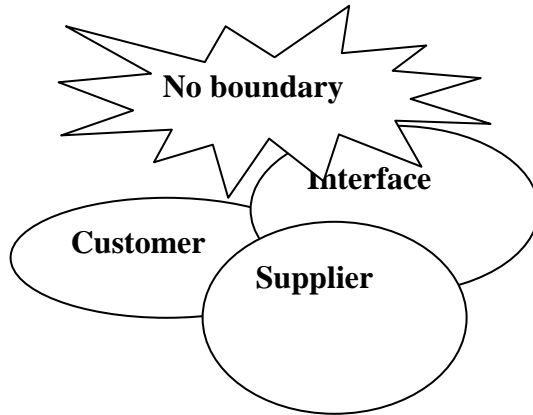


Figure: Old Lean Principle [3].



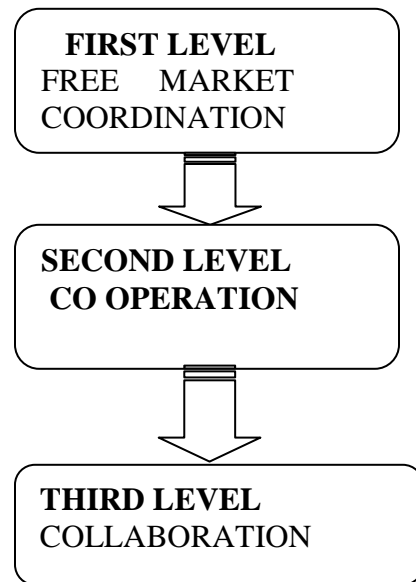
**Figure: Emerging Lean [3].**

### **3.1. The Levels of Integration**

The first level is *free market coordination*. The implicit coordination exists between enterprises in a free market.

The second level is *cooperation*. When two enterprises cooperate, they directly communicate and identify divisions of labor and desired directions and outcomes. They exchange non-sensitive information, and may establish an on-going relationship, building a base level of trust.

The third level is the *collaboration*. Collaboration enterprises begin to exchange sensitive information such as performance metrics, the long-term strategy, and the process data. The density of communication in collaborative enterprise is higher than in cooperative enterprise. A strategy is the alignment in collaborating enterprises. The fate is to consider as closely aligned. While communication is high, divisions remain between collaborating enterprises and the processes and infrastructure between them remain separate and distinct. As collaboration is to take into further, the boundaries are erasing. The integration occurs with the highest level of inter-firm trust. [1,4].



**Figure 2: The Levels of Integration.**

### **3.2. Barriers to Integration:**

Integration challenges have proven to be fraught with many barriers. The barriers to integration have simply held back large gains and integration has proven to be ineffective. To compound the problem, the technology of integration has been evolving quickly [1].

As such, the extended enterprise architecture has not become prevalent in many complex industries today. The benefit of integration becomes more of a reality.

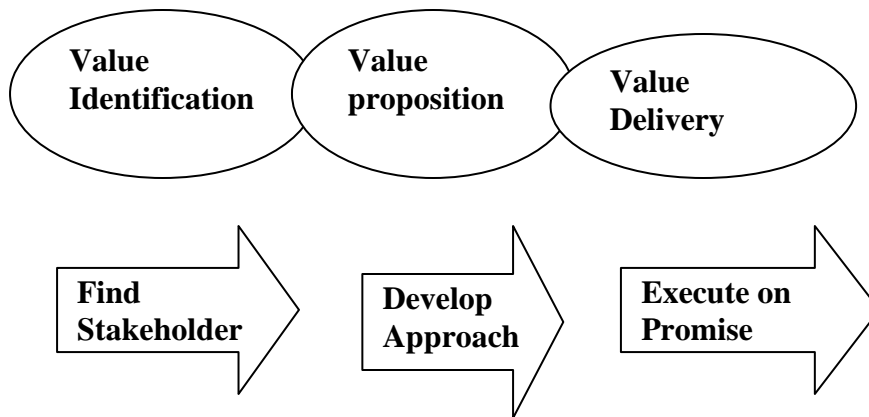
Our aim is to examine the most common barriers to integration across enterprises and to identify best practices and strategies for integration that mitigate the observed barriers. This increases the likelihood of success in enterprise networks.

The scope of this examination is not limited to purely technical or process-based challenges. It is to extend all critical barriers. The barriers may be technical, such as organizational hurdles or strategic challenges.

### **5. Value Creation:**

Value Creation is an important factor in enterprise integration. Every component has a value. The aim is to create the right products. This is the requirement with the efficient lifecycle and enterprise integration. The customer is a part of integration in the value

creation of the supplier. Every transaction implies information and coordination about the customer specific product design .It is the base on a direct communication between the customer and supplier as the result of a divided construction process. This type of value creation breaks with the traditional view of value creation in a firm [5].



**Figure 2: The value creation in a network [4].**

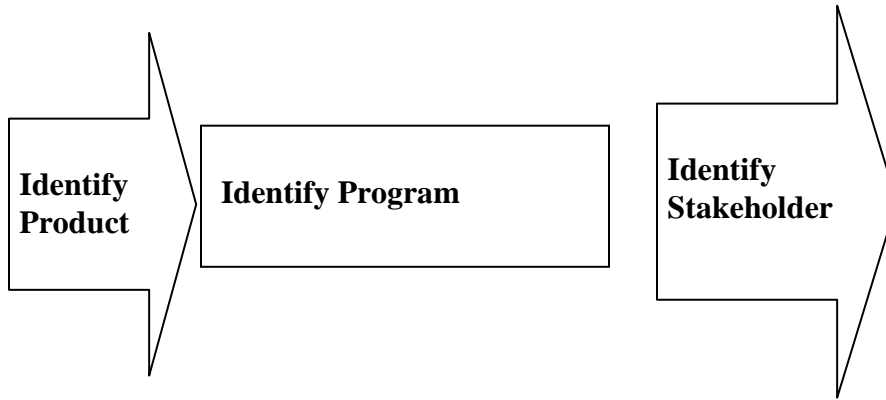
The value is the mutual creation created among the factors on the different levels. Customer integration is a form of industrial value creation where “the consumers take part in activities and processes which used to be seen as the domain of the companies” The result is a system of co-production, i.e. a company-customer interaction and adaptation for attaining benefit [5].

### **5.1. Elements of Value Identification:**

The basic requirement to identify the value of an enterprise is to define the user needs as per the requirement in an enterprise. In order to execute this principle, first there is a need to find the stakeholder in the enterprise.

The next stage is the value proposition stage. In this stage, the process of development undergoes as per the required approach. The right product is to identify with the required capabilities [5].

The last stage is the program implementation. A strategy is to develop which is suitable for the program. This stage is the planning stage. The execution takes place after identifying the approach, which suits the plan.

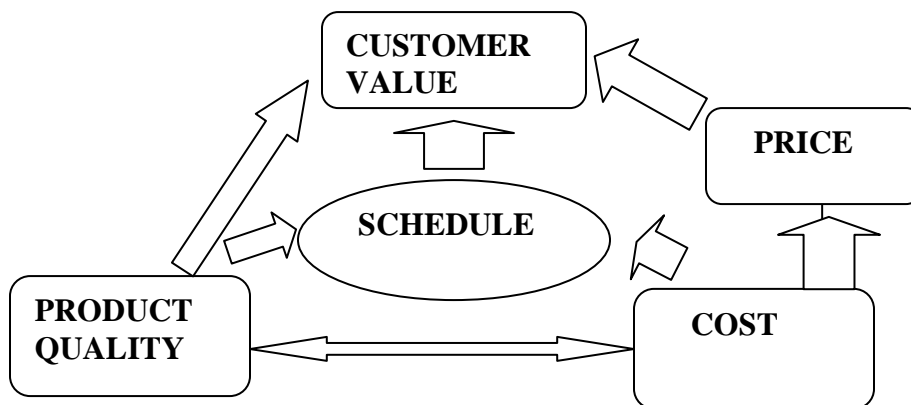


**Figure 3: Elements of Value Identification [4].**

The customer becomes a “co producer”. The customer integration is the connection with the possibility of charging premium prices derived from the add value of a solution meeting the specific needs of a customer.

A process is perfect through the gradual improvement. This is the application to any product. In order to achieve the perfection a continuous modifications is required. The Customer determines the value of a product. This system is the pull system.

The customers pull cascades to the lowest level supplier enabling just in time production. The products require the system of streaming the process. This streaming of information or the process cycle is a principle of lean. The mapping of the end-to-end linked resources is applied. The inputs and outputs are to identify to eliminate waste [6].



**Figure 4: The customer creates the product value creation [4].**

## 6.1. Enterprise Network Life cycle

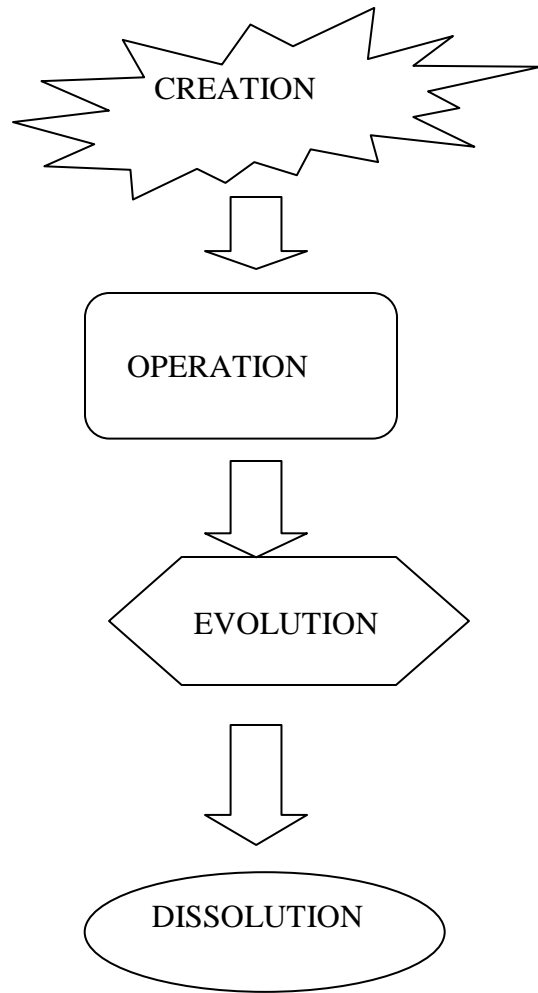
A key characteristic of enterprise networks mentioned above is their temporal nature. The common processes of creation, dissolution, operation and evolution. These make up the basic life cycle of all limited duration enterprise networks. Four stages that are sufficient to appreciate the importance of understanding enterprise network life cycles [1].

The first major stage is *creation*. This is also the most critical stage to the overall success of the network. The key activities in this initial stage include the definition of many crucial aspects of business, technology, and organizational strategy. They include partner selection, definition of access rights, data and information sharing. Each of these processes is critical to the long-term vitality of the network and is individually the subject of a great deal of current research in the field of enterprise networks.

The second major stage is *operation*. The operation stage encompasses the routine day-to-day operation of the network. The processes designed in the creation stage are put into operation, and other routine processes are implemented within the information management architecture. Processes in this stage include secure data exchange and information sharing, order management, dynamic planning and scheduling, and task management and coordination.

A third stage in the life cycle of enterprise networks is *evolution*. Evolution stage handles the exceptions to routine operation, such as a change in the environment, a change of network membership, or other events or conditions that would necessitate a change in course and restructuring of the network. In this phase, many of the processes from the creation phase are under consideration.

The final life-cycle stage is *dissolution*, when an enterprise network has reached the end of its useful life; either by completing its goals or through the determination of a network collaborates, and must dissolve.



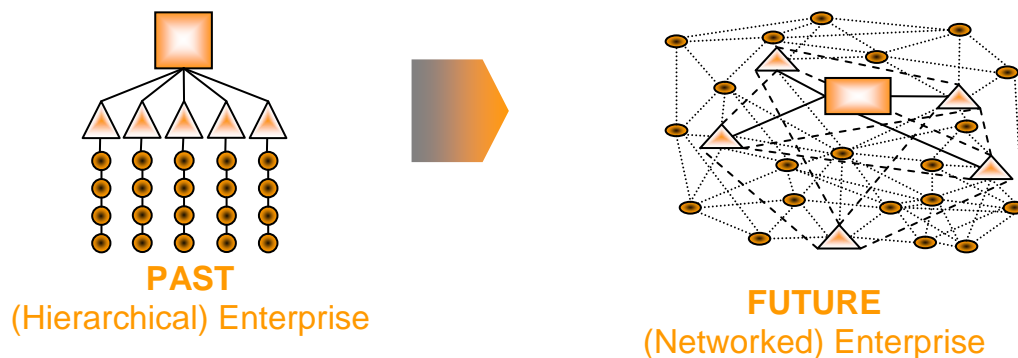
**Figure 6: The Enterprise Network Lifecycle**

## 6.2. Enterprise System Architecture:

Enterprise Systems Architecting is a new strategic approach .It takes a systems perspective. Architecture views the entire enterprise as a holistic system. It encompasses multiple views, which include organization view, process view, knowledge view, and enabling information technology view in an integrated framework [7].

The current enterprise architect practice is established .It has clear extensions. Apart from these, there is a need to develop the method of architect. The prevailing view tends to be information technology centric. It works well for the simpler enterprises. The enterprises align processes and technology with organizational structure.

This art and science needs to be more highly integrated with strategy and culture, and we require some new lens with which to view the enterprise. The past enterprise consisted of a hierarchical structure with defined roots within them. The future enterprise consists of well network architecture. [7].



**Figure 6: Change in Architecture from present to future [1].**

The term “nested complexity” is to describe a physical system embedded in a policy system. The product system is the means to the stakeholders. Enterprise Architecting deals the way to design an enterprise that can most effectively produce a desired ‘product system’. The basic principle to cite heuristics and emerging principle is to architect. Enterprise systems Architecting is working toward transforming Enterprise Architecting from an art to a science. The enterprises can be predictability architected and engineered.

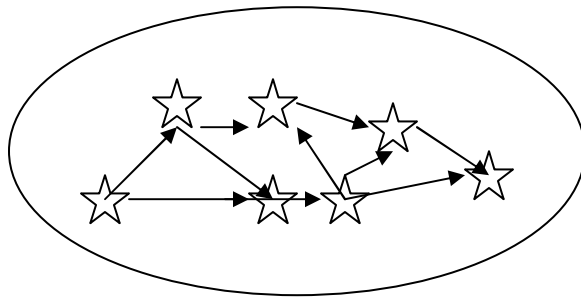
## 7. Stake Holder:

A stakeholder is ‘any group or individual who can affect or is affected by the achievements of the organization’s objective’. The stakeholder set involves in the design, development, and sustaining of modern enterprises is large and represents many diverse perspectives [8].

The Enterprise Principles initially focused on the customer. The recent enterprise research has revealed that the critical success factor for today’s enterprises is to balance the needs of all stakeholders. It is critical that these multiple stakeholder views and contributions to the enterprise are in its design to achieve desired performance objectives. Shareholders provide capital and expect a positive return on their investment. This enables by ongoing innovation, growth, and profitability by the enterprise. Employees – including all levels of management and the workforce are another group of stakeholders, contributing effort and knowledge within the enterprise. This is the center of value creation, which these stakeholders provide in return for fair compensation, personal growth, pride, and various other tangible and intangible factors. A union, yet another critical stakeholder, may represent some employees. [9].

### 8.1. Organization:

Organizations are generically a large number of people unified by common goals. The word “organization” is associated with other characteristics such as clear boundaries and leadership with an encompassing span of control. Literature on organizations generally follows these assumptions of an organization being a single unit with one span of control. Programs generally involve teams from many different organizations. They involve large subunits of organizations acting as coordination between the different departments. [4,10].

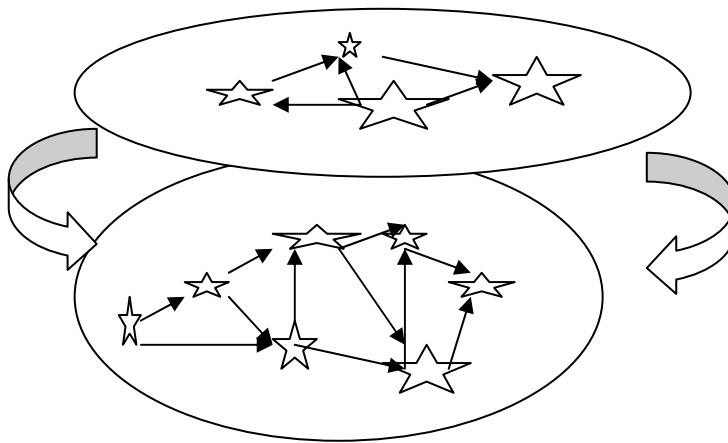


**Figure 8: Organizational Network**

## 8.2. Inter Organizational Network:

Programs fit squarely in the level of inter organizational networks. The teams are often more specific and focused than networks. Just like the relationship between teams and groups, programs, or more broadly enterprises, are a more focused instance of Inter organizational networks. Enterprises have a specific purpose, distributed leadership, and stakeholders with common and diverse interests.

The teams are a base on interpersonal relationships and face-to-face interactions, whereas the programs are base on both inter personal relationships and inter organizational relationships. As a result, teams and programs have different issues with regard to power and politics as well as coordination. Finally, whereas teams often span cross-functional boundaries, program enterprises span cross-organization and cross-cultural boundaries. [4,10].



**Figure: Inter Organizational Network**

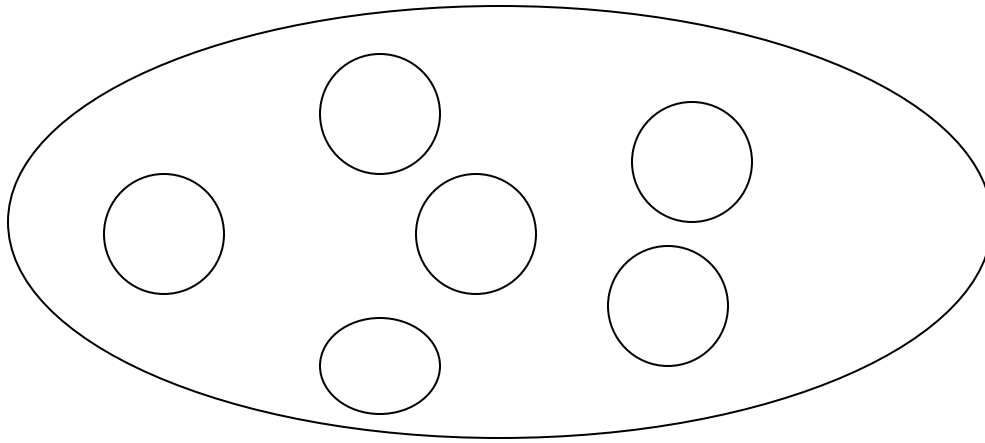
## 8.3. Group:

The definition of a Group is

“A smaller set of people. The Group consists of complementary skills. They are committed to a common purpose. They have a common performance goals and approach. They hold themselves mutually accountable. [ 3, 11].

Considering the same sort of scaling that exists from groups to organizations, the logical analogous jump from teams would be to large-scale projects that involve many teams working towards common goals in such a way that they are mutually accountable.

[ 4, 10].



**Figure 9: A Grouped Network [1].**

#### **8.4. Collocation**

Some industries and large producers saw the benefit of a more tightly integrated network of enterprises. They sought ways to minimize communication and coordination costs in order to develop closer, more integrated relationships. One method of lowering these costs was to locate many parts of the network within close geographical proximity to each other in order to facilitate the timely exchange of information and material.

Collocation leads to the closed, static networks. It consists of high barriers to entry and the exit. This network has high asset-specificity. Many enterprises are hesitant to co-locate without substantial, long-term, guarantees that often are not possible in program-based extended enterprises that will dissolve at the termination of the program or project. [1,4].

#### **9. Conclusion:**

Integration of enterprises is the key element for the success of business structure in the future. This is especially for the complex project-based industries. The basic goal is to identify opportunities for integration and to establish strategies to overcome barriers to integration for the enterprise. Integrating the network should represent a perfect architecture. The strategy has been successful in large part. The program spent a large amount of resources during the creation phase to carefully identify strategic integration goals, and match them closely with available, maturing technologies for integration [10].

Strategic goals at the Program include the involvement of international partners, high security standards with several levels of access control, design version control, centralized exchange of data and collaborative design. This proved to be a successful strategy and allowed to develop its infrastructure quickly.

Another key for successful integration identified on the program was to match the extent of integration present in the organizational architecture with the extent of Integration found in the product system architecture. The strategy has been successful in large part because the program spent a large amount of resources during the creation phase to identify strategic integration goals. After the identification, the program matching is by closely with available technologies for integration [11].

The identification of the Value Creation is an important factor in enterprise integration. The aim is to create the right products with the required value. This is the requirement with the efficient lifecycle and enterprise integration. The customer is a part of integration in the value creation of the supplier [11].

The key element of integration is to achieve through the seamless flow of information. This is through the utilization of latest available technology. The other element is the requirement of a perfect leadership and understanding between the different departments of an organization. The latest implementation is to achieve by eliminating the boundaries and barriers between the different departments and making it as a whole [11].

## References:

1. Christopher G. Glazner, “*Enterprise Integration Strategies across Virtual Extended Enterprise Networks: A Case Study of the F-35 Joint Strike Fighter Program Enterprise*”, 2002.
2. Allen.C.Haggerty,” Bridging design and manufacturing through lean”, MIT, 2005.
3. “*Lean Enterprise Creation-Anew Frame work for small business*”  
[http://lean.mit.edu/index.php?option=com\\_docman&task=doc\\_view&gid=185](http://lean.mit.edu/index.php?option=com_docman&task=doc_view&gid=185)
4. Joyce Warmkessel,” Value Creation through Integration workshop:3-10”, 2002.
5. Frank T. Piller, Kathrin Möslin, “From Economies of Scale towards Economies of Customer Interaction: Value Creation in Mass Customization Based Electronic Commerce, 219”, 2002.
6. McLean Defense Group “Enterprise Integration”  
<http://www.lld.com/entint.html>
7. Camarinha-Matos, L. M., and Afsarmanesh. “*The Virtual Enterprise Concepts and Infrastructures for Virtual Enterprises*: 209-218 ”, 1999.
8. Deborah.L.Nightingale, “*Lean Aerospace Initiative*”  
[http://lean.mit.edu/index.php?option=com\\_docman&task=cat\\_view&Itemid=88&gid=75&orderby=dmdate\\_published&ascdesc=DESC](http://lean.mit.edu/index.php?option=com_docman&task=cat_view&Itemid=88&gid=75&orderby=dmdate_published&ascdesc=DESC)
9. Venkatraman. N., “*IT-Enabled Business Transformation: From Automation to Business Scope Redefinition. Sloan Management Review, winter 1994: 73-87*”, 1994.
10. Hamada H. Ghenniwa, “An Agent-Oriented Marketplace Architecture for Enterprise Integration: 4-13”, 2000.
11. Deborah J. Nightingale and Donna H. Rhodes, “Enterprise Systems Architecting: Emerging Art and Science within Engineering Systems, MIT Engineering Systems Symposium:3-12,” 2004.

