

# Strategic Growth Initiative as a Competitive Advantage for Suppliers/Subcontractors

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## Abstract

A system's behavior can best be understood in the context of relationships among its components, other systems, and resources. Major Aerospace & Defense Contractors use systems thinking as a way of understanding complex systems engineering design type situations by looking at them as combinations of systems. Many of these contractors have outsourced portions/all their design practices to suppliers. This allows contractors to **streamline costs, take advantage of new technological advancements, reserve company personnel, and obtain cost-efficient solutions**. These advancements and cost can be followed up with a process initiative for displaying Strategic Growth with Suppliers and Subcontractors of successful systems using these systems thinking mindsets. The focus will account for demonstrating effective technical coordination through Technical Design Reviews (TDR) with contractors and customers and building a strong cultural bond between systems engineering and customers organizations. Systems Thinking is critical to the success of the overall strategic growth of any contractor, subcontractor/supplier relationship with respect to overall technical competitiveness in systems engineering. **A robust system thinking process can enhance technical influences in strategic growth profiles upon the vision and value of all stakeholders**. The presentation will identify a **strategic growth initiative process as a competitive advantage to be gained by extending systems thinking to suppliers and subcontractors**.

## Discussion

A strong contractor exists around strategic growth and Systems thinking mindsets between customers, contractors and suppliers are at times inconsistent. The inconsistency could exist due to the inability to practice the process of unlearning out-of-date and ineffective concepts. This includes identifying what is no longer useful un design and technology, effective methods, processes, and positions. A Blueprint Operations Speedway for Success (BOSS) marketing strategy model is in existence which identifies growth options and provides a framework for defining a strategic initiative for remaining on operation (Growth Options for Martial Arts, Kenneth L. Preston, 2013). This model is supportive for suppliers and subcontractors as they develop an initiative for their Systems Engineering profiles. Suppliers and subcontractors are expected to effectively dissect, evaluate, analyze, and respond to copious amounts of potential design solutions, analyses, evaluations, modeling, and assumptions made in procuring a design. **Cost, budgets, future strategy, visions and implementation of affordability concepts are essential to the overall setup for growth strategy** in their detailed project and engineering plans. These processes and concepts are made possible through the ability of supplier leadership to utilize systems thinking to build upon their skilled labor effectively and maintain and enhance their understanding and technical efficiency of their company position. Supplier and subcontractor systems thinking allows for excellent decision-making when addressing information in systems engineering, large and complex proposals, and solutions, managing, and determining value, while meeting the conditions required for being an extension of their contractor(s).

This paper will identify a growth process for achieving successful systems, focusing on demonstrating effective technical coordination with contractors and customers and building a strong cultural bond between systems engineering and customers organizations. Systems Thinking is critical to this growth process from an upper management perspective and to the success of the overall growth of any relationship with respect to their overall technical competitiveness in a homogenous market (customers with the same needs). **This system's thinking provides the opportunity for suppliers and subcontractors to strategically expedite their efforts to remain competitive against their competition.**

A powerful system thinking process can be used to enhance the relationships required for a positive technical influence upon the vision and value of all stakeholders. Contractors in recent years have resorted to more to outsourcing portions or all their design practices to their suppliers and that process is expected to continue in the future. The concept of outsourcing has resulted in **lower costs, strategic partnerships, supplier expertise** and a need for small volumes. These strategic partnerships allowed for competitive advantages between supplier and contractor in design tools and processes. These partnerships are essential and successful for utilizing systems thinking within strategic growth plans by the suppliers and subcontractors to build their **skill levels, customer relationships, enhance decision making, and develop effective ways to capture a range of contracts** solve complex aerospace and defense dilemmas.

The use of systems thinking is a cost-effective opportunity for any growth strategy supplier-to-contractor relationship if applied appropriately. The result is for the supplier to emulate the contractor as one entity in their thinking, demeanor, mindset, decision-making, and conclusions. This one combined entity draws increased confidence, trust, influence, and initiative between supplier and contractor among some things. Therefore, the element of systems thinking is ideally a competitive advantage in industry. A part of the success of systems thinking is the realization of suppliers to think like their contractors. One of the challenges that exists when suppliers are attempting to think like their contractors is the importance of motivating individuals to be system thinkers to shape a successful system thinking organization (Systems thinking applied to organizational culture (Carly Snider-2017)). This is first evident when suppliers receive proposals from their contractors to undertake some type of conceptual design. The requirements to be taken into consideration flow from the contractor's engineering organization through the contractor's supplier management organization to the supplier contracts group. It is during this process that suppliers review those requirements and use their own knowledge and past experiences as to how to execute those requirements to meet contractor expectations. Very rarely is there any coordination or clarification of those requirements coordinated with the contractor. **The acceptance of the proposal design responses is usually based upon individualistic experiences and knowledge. It results in suppliers becoming more adaptable in the process of design affordability with respect to the proposal process.** All of which is essential in the final decision-making process for the best design result for the end user. These concepts, from a company perspective, can lead to a more productive, cost efficient, and competitive advantage between supplier and contractor when the supplier can possess a contractor mindset.

**Systems thinking using data analytics can result in a strong marketing and technical mindset with the contractor for generating high-yielding products at affordable costs and technological enhancements.** A tremendous amount of time is invested financially in data collection, data monitoring, trending, and analysis of root causes used for these high-yielding products (Big Data Analytics/Role of Analytics in Systems Engineering, International Council of Systems Engineering, Dr. Kenneth L. Preston, 2016). These high yielding products leads to service excellence as a competitive advantage between clients striving to satisfy contractual

customer requirements and resulting in strong technical relationships (Customer Analytics for Service Excellence in Systems Engineering, International Council of Systems Engineering, Dr. Kenneth L. Preston, 2020). The competitive advantage becomes evident when the supplier can use contractor systems thinking decision-making criteria in strategizing plans for problem solving and critical thinking when making business decisions based upon available or newly developed technical data and drawing sound conclusions from it. Furthermore, developing a standardization and duplication process to have a common process between supplier and contractor is a benefit when **considering continuous improvement and lean practices**. The decision-making is critical and essential to stressing investments and identifying alternative technologies when the supplier is faced with the concept of data analytics of dissecting, evaluating, analyzing, and responding to substantial amounts of analyses, evaluations, modeling, and assumptions made in procuring a design. Many times, this data is ever changing and can be volatile when addressing feedback and coordinating with mitigating options with contractor engineering (Customer Analytics for Service Excellence in Systems Engineering, International Council of Systems Engineering, Dr. Kenneth L. Preston, 2020).

**The growth strategic success factors are based on these benchmarks are when the supplier understands the contractor customer criteria, standards, cost efficiencies, design enhancement, contractor customer expectations, desired business growth strategies, and past lessons learned** without having to consult with the contractor. Systems thinking is one of the benefits between supplier and contractor when good decision-making results in effective cost and design solutions of large data. Customer service excellence means knowing what your customers need and expect and acting upon these expectations (Rodenbaugh, Dave, [www.quora.com](http://www.quora.com), 2014). The competitive edge from these success factors is an aftermath of being able to think and behave like the contractor using the systems thinking approach. This is a major advantage from the perspective of the supplier and subcontractor when planning for future business.

There is a proposition available for designing an aggressive growth strategic process upon achieving successful systems/designs utilizing systems thinking concepts. That process is shown below in Figure 1: Revised Basic Design Process. **Following and understanding a basic design process** is a fantastic way to proactively engage in systems thinking resources between contractors and suppliers and present a competitive position for capturing future business. This is a standard process already utilized by contractors and suppliers/subcontractors today.

The systems engineering process begins with the definition of a problem followed by collection of information to be brainstormed and analyzed. Solutions are developed in preparation for built models to be assessed. The process concludes with presenting results with feedback and later an improved design if applicable. In Figure 1, the items in red represent the features of the systems thinking module. They have been carefully aligned with the proper areas of the design process that can be executed between contractor and supplier/subcontractor. These features play a vital role in orchestrating the technical accounts of a growth process. The engineering and management focus will account for demonstrating effective technical coordination through Technical Design Reviews (TDR) with contractors and customers and building a strong cultural bond between systems engineering and customers organizations. This bond can also meet **expand the opportunities and accommodate the needs of other potential stakeholders and customers. It can be used to solidify the stance that “leaders see themselves as needing to be part of a bigger picture, strategic plan, and partners with suppliers and consumers from end-to-end”** (D’Arienzo, Bill, Why Systems Thinking Must Be the New Norm for Supply Chain Management, 12/5/2018). It is important for this process to ensure that the **appropriate engineering resources and technical expertise from the TDR are accurately reflected as**

part of the strategic growth initiative. What better way to institutionalize the big picture capability of Systems Thinking between supplier and contractor than in the use of an existing engineering design process and integrating this into an overall strategic growth initiative for the future.

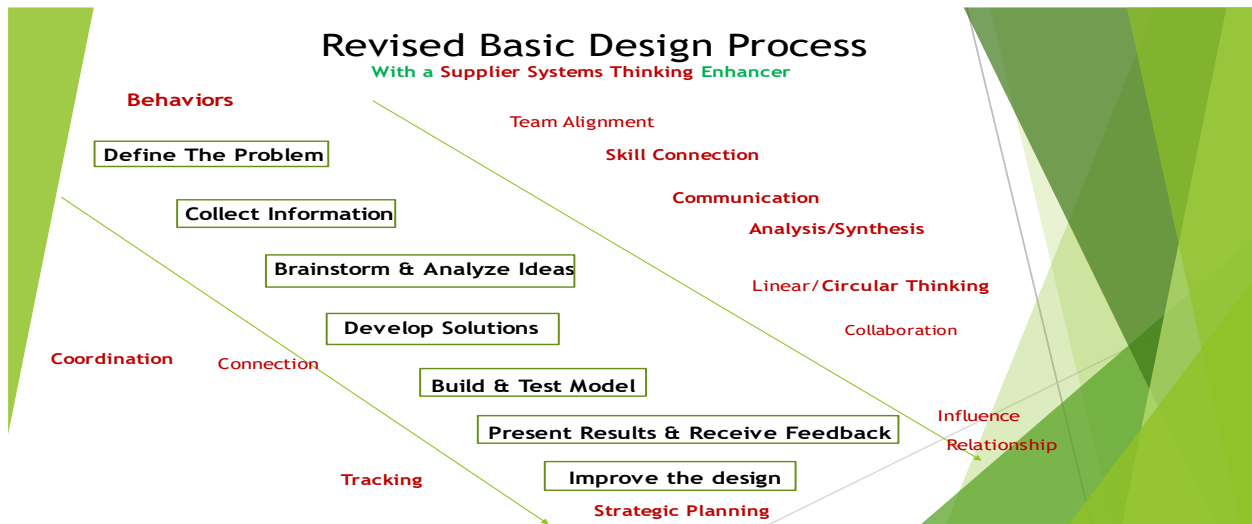


Figure 1: Revised Basic Design Process

A supplier’s organizational performance can be enhanced by incorporating and successfully executing systems thinking logic into the basic design process by understanding the competence factors of systems logic, processes, and mental models (Bradford, Robert, Systems Thinking in Strategic Planning). This is reflected in the design process when the supplier/subcontractor and contractor collaborate on defining the problem and collecting information prior to instituting the brainstorming and analysis process of the data. This is the point where the supplier and subcontractor can enhance or gain new skills by working jointly with the contractor and understanding their **behaviors and work ethic, technical management style, team alignment, vision, strategies, skill connection, and mental telepathy for defining potential root causes and mitigation factors** to either correct or develop a new design. In addition, these new skills can be integrated into their **strategic growth models and costs to map into futuristic customer profiles**. These combined features can result in improved decision-making practices, communication, and technical insight between supplier and contractor. The elements are also **effective when developing design solutions for developing basis of effort or rough order magnitudes in proposed contractual procurements**. The supplier also has an opportunity to provide a strong business and technical connection with the contractor in utilizing linear and circular thinking during the analysis/synthesis and strategic processes. **The combination of business marketing and technical coordination from the supplier and contractor can be a powerful competitive advantage for both sides**. This leads to building the needed trust between contractor and supplier to ensure the best cost-effective product design and future contractual direction for any planned prospectives.

The Systems Thinking process is critical to the success of the overall growth of any supplier and contractor relationship with respect to overall technical competitiveness. The competitive ingredients also include the necessity for **collaboration, tracking the results, and the strategic vision applied to the design process by the contractor but implemented and executed** by the supplier according to their understanding. This is also useful when **understanding the**

**behavioral mechanisms of the supplier and subcontractor internal mechanisms that has led to their success and future expectations of continued success in satisfying their customer's requirements.**

There are competitive advantage opportunities for current and future growth when it comes to the use of systems thinking between supplier and contractor unified mindset to achieve. Supplier and subcontractor leadership and management must focus on the **planning, design, and execution** of the strategic growth option to meet their future vision as outlined in figure 2.



Figure 2: Supplier Strategic Process

Supplier systems thinking allows for excellent decision-making when addressing information in systems engineering, solutions, managing, and determining other core values. The growth strategy must be committed to ensuring company capabilities, extending those technical capabilities, standards and uncertainties when identifying the strategic process. That combined mindset eventually leads to suppliers thinking like their contractors and producing competitive and growth solutions to complex problems.

The process begins with recognizing the need to understand the history, requirements, external needs, long term relationships, level of diversity that is present between the supplier, subcontractor, and contractor/customer. These seven topics begin the definition of the initial approach to the strategic growth process. The technical capabilities, interfaces, customer analytics and internal design capability are reflected and understood. This is followed by understanding the business case for designing a product with the why and how focus to complete the final architecture. This solidifies the rationale for the design of the project so that an informed decision can be made.

The process continues with predictive thinking, making of choices, fact finding and creativity, selection, and use of technology all while focusing on the budget and cost associated. Predictive thinking is beneficial in any growth strategy since it allows for the leveraging of known data past

and present to make the best choices for the future by “thinking outside of the box.” It should be assured that before final choices are agreed to in this phase, which approved brainstorming tentative solutions by way of fact finding and creativity has been completed. This is necessary to account for all options available to any design that have been captured. The success of these options will be dependent on the use of the technology selected. These factors are instrumental to suppliers and subcontractors accomplishing goals via their initiatives to meet their final solutions and their projected budget and costs affiliated as such.

The third stage of the process follows with long term decisions, consultations, acknowledging the supplier internal mindset, stakeholder changes, and any adjustments. The long-term decisions and consultations support the vision of the future and what is required. The planning and execution of that mindset is composed of the growth strategy. The internal mindset is the personal awareness of who the supplier and subcontractor are which includes their experiences, beliefs, values, and limitations. The internal mindset must be open to change. Finally, there must be an understanding and monitoring of changes in stakeholders, stakeholder needs and requirements at any occurrence.

The final stage concludes with potential resource expansions, presence of management and leadership practices, act on external and internal requirements, and addressing and accepting process ownership. The solutions identified in the previous steps are conceptualized with respect to resource capability, ensuring all requirements have been verified and validated internally and with the customer. Design skills and capabilities that are specialized are identified and accepted. Finally, leadership acceptance of process ownership is accepted, and accountability is realized.

These are the leverage points in competition and growth solutions that companies never realized they had before with their suppliers (Starr, Julie, Systems Thinking Collaboration are Key to Sustainable Supply Chains, 6/13/2013). That mindset also produces a competitive edge from the success factors as an aftermath of being able to think and behave like the contractor using the systems thinking approach. In pursuance of continued success, the suppliers should strive to apply the strategic growth process via systems thinking through implementation and keeping up with sustainable supply chain best practices (Starr, Julie). This is one of the keys to Suppliers utilizing Systems Thinking as their Competitive Advantage.

**A strategic growth process allows supplier and subcontractor leadership to make accurate decisions based upon the various stages of systems engineering, pending competitions, and customer demand and expectations.** A robust system thinking process in addition to consideration of affordability cost and benefits can enhance technical influences in strategic growth profiles upon the vision and value of all stakeholders. This also considers the familiarization of existing and new markets and technologies for personal enhancements and likely innovations. The presentation has identified a strategic growth initiative process as a competitive advantage to be gained by extending systems thinking to suppliers and subcontractors. **Effective growth strategies often lead to enhanced profits with a focus on product market initiatives** (Dr. Kenneth Preston, June 2013). Many suppliers and subcontractors attempt to distinguish their products and services (tools, materials, processes, and techniques) from those of their competitors and contractors. The systems thinking concept when utilized by supplier and subcontractor leadership is a crucial part of the development of an effective strategic growth process when considering the differentiation of these products and services as well as what is no longer working in the company and even leadership. The ability of the suppliers and subcontractors to develop standardized methods will benefit the results from a valued strategic growth process.

## References:

- [1] *Systems Thinking Applied to Organizational Culture*, Carly Snider, 2017.
- [2] *Systems Engineering Fundamentals*, Center for Technology and Management Education, [ctme@caltech.edu](mailto:ctme@caltech.edu), 2021.
- [3] *Customer Analytics for Service Excellence in Systems Engineering*, International Council of Systems Engineering (INCOSE), Dr. Kenneth L. Preston, 2020.
- [4] *Big Data Analytics/Role of Analytics in Systems Engineering*, International Council of Systems Engineering (INCOSE), Dr. Kenneth L. Preston, 2016.
- [5] *Service Excellence Team*, [www.montana.edu](http://www.montana.edu).
- [6] Rodenbaugh, Dave, what is the definition of customer service excellence? Entrepreneur, Software Developer, [www.quora.com](http://www.quora.com), 2014.
- [7] *Systems Thinking in Strategic Planning*, Robert Bradford, Center for Simplified Strategic Planning, 2021.
- [8] *Amplify Your Leadership Effectiveness: Apply Systems Thinking*, Dr. Dale Albrecht, Forbes Human Resources Council, 2017.
- [9] D'Arienzo, Bill, Why Systems Thinking Must Be the New Norm for Supply Chain Management, 2018.
- [10] *Customer Experience is the New Brand*, Leadership Strategy, 2018.
- [11] *Growth Options for Martial Arts*, Kenneth L. Preston, 2013.

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