Engineering Operations Strategies, Part II

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Table of Contents

Congratulations!!

Welcome to *Engineering Operations Strategies, Part II*, your do-it-yourself guide to creating an Operations Plan that works for your engineering firm.

Once you've been through this guide, you'll know precisely what it takes to write an effective Engineering Operations Plan and supporting documentation. More importantly, you'll have a sample of a powerful Operations Plan to get you started.

This is the next step in your business story. From this point on, you won't have to stab in the dark – you'll have clear direction. You'll start to see some real results for your efforts.

Once completing the on-line course at our web-site www.engineeringbusinesspubs.com, you will be awarded with 2 PDH. The on-line seminar includes reading this guide and passing the 10 question test on our web-site.

Currently 30 U.S States require licensed engineers to obtain continuing education credits (CEU) or professional development hours (PDH) in order to renew their license. The PDH awarded by our seminar will be accepted by your state licensing board. **I personally guarantee it.** If your state board rejects our on-line seminar PDH, please forward us a copy of the board's letter and we will refund to you the cost of the on-line seminar.

How to Use this Guide

Each step covers an important aspect of your Operations Plan – these are things that you must give special consideration to before implementing your Operations Plan.

You will be surprised how much this guide will reveal about your business. It will get you to think about important issues that may have never crossed your mind in the past. It may also uncover new issues. But it is never a better time to put together or update your Engineering Operations Plan then now.

While reading please go ahead and jot down some notes in the spaces provided. It will help to improve your Engineering Operations Plan.

Later sections will go into greater depth describing the Standard Operating Procedures, Quality Control and Quality Assurance, and Checklists.

Now, it's time to get started.

A Competitive Operations Strategy

The company's Operation Strategy can be marketed to potential clients as a main benefit in obtaining the firm. In determining the company's Operation Strategy that is competitive in the market the firm must first determine its core capabilities. The core capabilities are defined as the skill or set of skills that allows the firm to differentiate itself from the competition. The core capabilities in an engineering company's Business Model are the infrastructure's resources.

The success of the Operation Strategy depends on commitment and understanding risk of failure. The key factors of success are breaking down the strategy by work area, involving the team in creating the operation strategy, considering the risk, and getting commitment from the team. Having the plan on paper is meaningless unless everyone is made aware of it, and is onboard in the implementation and accountable to the plan. In addition, the plan should be updated periodically to make sure that the intended results are being accomplished, and if those results are not being accomplished the necessary revisions should be implemented.

8 Keys to Competitive Operations

Key 1: Shorter Product Cycle

Your company can adapt to new types of projects quicker than your competition. As an example the green movement has become an ever increasing integral part of engineering design. The companies that were able to obtain LEED certification first were able to market their new ability to team up with other LEED consultants. Project funding from the government for new projects are requesting this certification on their projects. In short, the first companies with a new product or service gets the greater share of the market.

Key 2: Production Flexibility

The ability of your company to shift from one type of project to another also is major benefit to your clients. In Land Development the ability to shift from residential design to commercial design, and then to public facility design such as parks and recreational facilities is a major benefit to a developer of master planned communities. One company can do the entire design instead of a number of firms specializing in a few of the land use disciplines.

Key 3: Low-Cost Process

The more efficient the process is in developing a product or service the quicker the end product is delivered to the customer. Engineering redesigns cost not only the engineering company, but also the client. Engineering companies generally update their software when necessary; usually when review agencies have commented on the out-dated software or the transfer of data becomes overly cumbersome to exporting to earlier versions of the software. But up to date software can be a major benefit to your clients; especially if it allows your staff to provide the technical reports and drawings quicker then your competition. The goal is always to get the best design the first time, and minimize revisions and redesign. The time required to draw a set of civil plans for a 100 residential unit project site using AutoCAD 2005 software without the land Development Design (LDD) package versus AutoCAD Civil 3d 2010 is significant. Developing a track record as the engineering company that has error free plans using the latest technology is a major benefit to customers.

Key 4: Convenience and Location

This may be hard to deliver for a small firm, since having a number of offices maybe difficult if the workload does not support the office expenses. If you have a major project and it is economically feasible, a more appropriate method is to open a branch office near the project site or client's office for the client's convenience. This can be done in the main company's home town or in another city or state. The size of the staff will depend on the workload. Of course the new office will also need to be properly licensed.

Key 5: Product Variety and Facility Size

Niche marketing can be very successful as long as that niche is needed. Once the competition also includes your service or product, you will see a rapid decline in your business. An example is that you are extremely good at writing and preparing Traffic Impact Analysis (a.k.a. Traffic Reports). You found that most engineering companies in your area outsource this service to another company out of town. The local governments are now requiring that nearly ever new development project to include Traffic Reports. To service this new demand, you decide to start a new service at your company by offering Traffic Reports to the local community. Marketing is easy, and the workload quickly overwhelms your small shop. So you hire and train new staff. Eventually the workload levels off, and stays that way for a number of years. Then you notice the workload is slowly dropping off. A quick survey of your previous and current clients shows that your competition has either trained their staff to provide this service or they have also hired staff to specifically provide the same service. They can now offer their clients the benefit of economies of scale. They can now offer more services to their clients and for less. From this point on your client base will continue to decline unless you start adding other services or change your strategy.

Key 6: Quality

Quality is very difficult to demonstrate to potential clients. For a professional service company like engineering this is measured more on the company's reputation. When you think of the best companies in town who are they? When you ask other engineers who are the best engineering companies in town are they similar to your list? Why is that? Due to these companies' reputation, they generally have a much higher demand for their services and they charge a higher price. Your can garner the same attention by increasing your firms presence in the market with quality design that saves your customers money. This alone will drive more customers your way.

Key 7: Environmentally Friendly Processes and Products

Protecting the environment by selecting processes that are safe to the environment is a major part of the green movement campaign. Being at the forefront of this movement can be a major benefit to your company and clients. Calling out green products in your designs were applicable and economical, looks good to a environmental friendly client. In some instance an additional cost for a green product is not unacceptable to a client, if he can recoup the cost in the long run.

Key 8: The Use of Information

Engineers are very adept at working with Information Technology, but they are also very conservative. Once they find software that solves their needs, they don't want to test newer versions of the software or other software. New technology including the software and hardware is often able to handle and store far more information, and at a cheaper cost. Good examples of this are lap tops and smart phones. Use of technology in the field allows the engineer access to data, drawings and information that the client needs. The engineer can complete a certification letter on the devices, print, stamp and sign, and hand the document over to the client in the field. The engineer does not have to return to the office and mail or hand deliver the certification document to client which saves time and money, but also allows the engineer to perform additional tasks. Making more use of this technology can be a competitive advantage.

Now, it time to jot down some thoughts.

What Competitive Operations Strategies has your company implemented?

What other Competitive Operations Strategies could your company implemented?

Designing the Production System

> *A place for everything, everything in its place.*
>
> Benjamin Franklin

Although your engineering firm is a professional service company, it probable does produce some products; development plans, technical reports, technical drawings, and so on. The Operations Manager is responsible for selecting the product design, the production/service system, and the inventory policy for finished goods for each product line. For most engineering companies the operations manager is the project manager.

- Product Design
    - Customized Product Design – Products are designed to meet individual customer needs. The emphasis is on quality and on-time delivery.
    - Standardized Product Design – Importance is on cost-control and quality.

    Example: Most Improvement Plans are extremely customized. The company's reputation is based on providing quality plans that require few if any revisions and meet or exceed project milestones. Within the company many of the steps in processing the design of the plan set can be standardized. Various details utilized by the staff can also be standardized.

- Production System
    - Product-Focused Systems: Employed in mass production – standardizing products.

- Process-Focused Systems: Generally for a single task (highly flexible) used in customized products.

  Example: In general, the production of design and plan sets is process-focused. A well organized design team understands the process, and works together to constantly improve the process.

- Service System

  - Customer-Oriented: Extremely Customized service. Strong customer relationships. Depends on loyalty between the customer and the business. Most small firms use this type of system.

  - Process-Oriented: The business concentrates on the process. Streamlining the business system to reduce costs. Medium size firms tend to follow this system.

  - Service-Oriented: The business looks to diversify the types of services provided to the customer. New departments and staff are created to support the new services. Larger firms tend to use this system.

  Example: The engineering company is extremely customer-oriented. This is due in large part that most engineering firms are quite small. Even large engineering companies are actually a group of smaller sections each with their own set of clients. The section cross sell the services of the other departments to their clients.

Finished Goods Inventory Policy

- Produced-to-Stock Policy (Make-to-Stock) – Produced in anticipation of demand and stored until receiving customer orders.

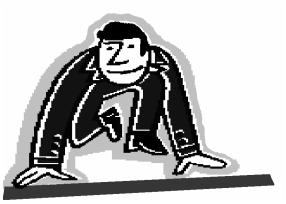
- Produced-to-Order Policy (Make-to-Order) – Production starts after receiving the customer order. Made to customer specifications.

- Assemble-to-Order Policy – Products and Services are added options according to customer specifications

Example: Because each new job is different with its own set of constraints, the engineering company has no set of plans setting on the shelves ready for the next client. So providing a set of Improvement Plans for a residential project fits the category of Assemble-to-Order Inventory Policy.

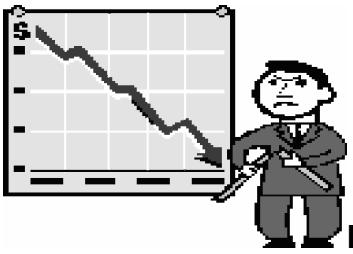
Product/Service Design and Development

Every new Product and Service the company brings on line has a Life Cycle. This cycle is often described as the S-curve.

-  **Introduction Stage** – During this stage sells are low and slow. The product or service is just being presented to the market, and the potential clients are being educated on how its benefits. The time period within this stage depends on promotion, other marketing efforts, and the market need for the product or service. Profits are negative or insignificant.

-  **Growth Stage** – Those products who survive the introduction stage enter the growth stage. In this stage the market is aware of the product or service and knows that they need and want it. Sales increase exponentially. Expansion is discussed.

-  **Maturity Stage** – Eventually the sales begin to level off. In order to increase profits focus is placed on improving efficiency of the process, minimizing costs, etc.

-  **Decline Stage** – Sales decline due to obsolescence of technology, changing client requirements, the availability of substitute or complementary products, and/or a decline in the market.

Example: An engineering company is known for providing Traffic and Transportation Engineering for Public Works projects, but it wants to expand its services to the private sector. During this introductory stage they know that it will take some time for the potential private sector clients to become accustom to the fact that the firm has expanded to providing Improvement Plans for residential developers. Initially the company informs its current clients of their new service, but since most of them are with the government, the need for the new service is very low. The company expands its marketing to local home developers, and again the request for proposals are very low because the business is a relative new comer to the market. After many months of marketing the company has begun to work on one or two contracts. The clients are happy with the service and ask the company to work on their next projects. The company is able to gain existing client loyalty and garner some new clients. They have finally entered the growth phase. Throughout the next several years they continue to gain new clients, until finally they level off with a consistent amount of residential improvement plan work; the maturity phase. After several more years the community has grown to its capacity and the amount of new developments have dropped off. The company is now seeing fewer residential development projects, and they have reached the decline stage. At this point the company has to find other markets in order to maintain revenues.

What stage are your company's services and products?

Service:	□ Introduction □ Growth □ Maturity □ Decline
Service:	□ Introduction □ Growth □ Maturity □ Decline
Service:	□ Introduction □ Growth □ Maturity □ Decline
Service:	□ Introduction □ Growth □ Maturity □ Decline
Product:	□ Introduction □ Growth □ Maturity □ Decline
Product:	□ Introduction □ Growth □ Maturity □ Decline
Product:	□ Introduction □ Growth □ Maturity □ Decline

Now that you have had some time to think about your services and products, you may want to think about adding new services and products to compliment or replace those that are in the mature or declining stages.

Steps to the Development of New Products

Introducing a new product or service to the market can be daunting, but even here there are steps that if taken can easy some of the stress and worries.

- **Idea Generation** – There a number of new products and services that can be added to any engineering company's menu. Based on the company's capabilities some product and services are better suited then others. The idea in this step is to

generate as many possible ideas as possible. This is also commonly referred to as brainstorming.

- **Feasibility Studies** – Each new product and services initially cost money to implement and to market. Understanding the cost to benefit of each possible product and service is best to be understood before the selection process. When looking at the cost include what new equipment, software, technology, and staffing will be required. In addition, estimate the length of time to make a profit and what the sales need to be in order to break even.

- **Prototype Design** – Once the new product and service has been selected the next step is to create a prototype. Whether a service or an actual product like Improvement Plans a sample needs to be created for testing and improvements.

- **Prototype Testing** – The next step is to take the prototype product or service out for a test drive to discovery its limitations. Does the product and service do what you expected? Is it better or worse? Can it be improved further? Once these and many other questions have been answered, the prototype will need to be modified and improved until it meets or exceeds the competition.

- **Initial Design of Production Model** – Once the new product or service prototype kinks have been worked out, the nest step is the design or layout of the new product or service. Improvement Plans should have a consistent layout and appearance for the company. The company should create checklists to allow the designer, engineer, and the company's reviewer to check and review the plans for any errors, missing designs, or vague details and notes.

- **Economic Evaluation** – Can the product or service be sold in the market for a reasonable profit to the company? Does the cost to produce the product or service within the anticipated or acceptable margins? If higher, can it be modified to fall within the margins? Should the new product or service be sold as a fix fee line item or as time and material? Producing a Technical Drainage Study that cost the company $5,000 to create and produce, but clients want pay more than $4,500, will require additional testing to either reduce the production cost or increase the client's perceived value. If you can not make a profit from the new product or service, then it is not prudent for company.

- **Market Testing** – The next step is to perform a small scale market test. This is best facilitated by marketing your existing clients. Once the new product or service has been used by your small test market, your firm should follow-up with a survey to determine your clients' likes and dislikes about the new product or service.

- **Final Design of Production Model** – Finally, with the market testing results make the final revisions to the product or service and full speed on the marketing to the masses.

- **Technology Selection and Process Development** – There is as much competition in the market with various types of technology as there are competitive engineering companies. Select the best technology for your intend use. A $5,000 piece of software may be able to provide you what you need and a whole lot more, but maybe a $500 piece of software may also provide the same information without all of the bells and whistles. Plan out in detail the necessary technology and ever step required to produce the product or service.

- **Allocation of Resources to Strategic Alternatives** – Next determine what resources are required to produce the product or service. These resources will be equipment, material, software, and staffing. Determine what resources you already have within the company or outsourced, and what is yet required.

- **Facility Planning** – Bring on a new product or service may require additional space or even adjusting the furniture around to make room. Adequate facilities to produce the new product or service without compromising your current products and services are critical to the competitiveness of the organization.

Service Strategy – Processes and Technology

Service firms like engineering companies can be divided into four (4) categories:

- Professional Service: Highly customized and labor intensive

- Service Shop: Customized and labor intensive

- Mass Service: Less customized and less labor intensive

- Service Factory: least customized and least labor intensive

Note: Generally, engineering companies are categorized as Professional Service. This is primarily due to the fact that no two projects are exactly the same even for the same client, and all services and products are labor intensive.

About the Author

Joe Alvin Haun, PE, MSE

Joe Haun is a highly experienced Civil Engineer, author, public speaker, and business advisor who have worked in the engineering profession since 1983.

Mr. Haun's early career was in the United States Air Force as an Engineer Assistant. A Desert Storm veteran he has a unique perspective of the Middle East.

Mr. Haun graduated from the University of Las Vegas, Nevada in 1994 with a BS degree in Civil Engineering and in 1995 with a MSE in Civil and Environmental Engineering.

Mr. Haun worked with several engineering firms in the Las Vegas valley until February 2005 when open his own engineering company HAUNTEC, which has grown to a designing multi-million dollar projects in Nevada and Utah and in the countries of Iraq and Costa Rica. Review his growing company's website at www.haunteceng.com to see the firm's latest capabilities.

Mr. Haun has published articles in engineering magazines and has given speeches on water resources, and is currently working on several articles on permeable pavements.

In 2009, Mr. Haun started Engineering Business Seminars and Publications to. His first publication is the "Engineering Business Success." He has created many self-study engineering business seminars for Professional Development Hours credits. Visit the web-site www.engineeringbusinesspubs.com to review the latest seminars and publications.

Recommended Reading List

Engineers are constantly learning about new techniques, products and design methods. Improving your skills as a business leader is no different. Reading books is one of the best ways to improve your skills. Below is a list of books we recommend.

- *Engineering Business Success* by Joe A Haun (book)
- *Engineering Business Plan* by Joe A Haun (seminar)
- *Engineering Marketing Strategies* by Joe A Haun (seminar)
- *Engineering Operations Strategies* by Joe A Haun (seminar)
- *Engineering Financial Strategies* by Joe A Haun (seminar)
- *Engineering Proposal Strategies* by Joe A Haun (seminar)
- *Engineering Joint Venture Strategies* by Joe A Haun (seminar)
- *7 Habits of Highly Effective People* by Steven Covey
- *First Things First* by Steven Covey
- *Awaken the Giant Within* by Anthony Robbins
- *Unlimited Power* by Anthony Robbins
- *The E-Myth Revisited* by Michael E. Gerber
- *Get Clients Now* by C. J. Hayden

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