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Business Plan for the Startup and Subsequent Operation of a Truss Manufacturing Plant

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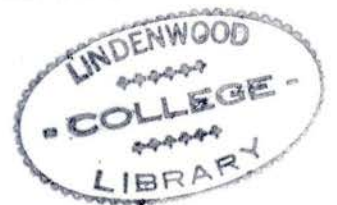
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Business plan for the startup and subsequent operation of a truss manufacturing plant.

Timothy M. Liescheidt, B.S.

An Abstract Presented to the Faculty of the Graduate School of
Lindenwood College in Partial Fulfillment of the Requirements for the
Degree of Master in Business Administration

1998



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ABSTRACT

This thesis is intended to present a thorough business plan for a truss manufacturing plant. The thesis will give the reader a complete understanding of the purpose of a truss in the building industry. The thesis also presents research on existing truss manufacturing plants and determined how the companies in this field currently operate. Once the research was completed, the business plan was prepared. The completed business plan was presented to three individuals who, by their experience, can be considered subject matter experts. These three individuals were then asked to give input about the completed business plan.

The input from the three subject matter experts was used to determine the validity of the business plan. Analysis of the results of the subject matter experts' input concluded that a new truss manufacturing plant closely following the procedures in the business plan cannot be statistically proven to be successful. The business plan was, however, considered to be one that could persuade potential investors to commit to finance the truss plant

Business plans are often considered to be a blueprint for operating a business. The purpose of a business plan is in fact more than just a blueprint, it is a tool for communicating an idea to an investor. If the business plan is very good, it will get financed and the business will become a reality. If the business plan is anywhere less than very good, it is worthless because the business will never happen.

This thesis is actually intended to be dual purpose. The primary purpose is to research an industry and give accurate operating data. The second, less distinct purpose is to prepare a business plan which will present financial data in such a way that a

potential investor will feel confident that his or her money is secure and providing a good rate of return.

Business plan for the startup and subsequent operation of a
liver manufacturing plant.

Entrepreneurship 101

A Business Plan for the Startup and Subsequent Operation of a
Liver Manufacturing Plant
Submitted to the Department of Business Administration

**Business plan for the startup and subsequent operation of a
truss manufacturing plant.**

Timothy M. Liescheidt, B.S.

A Culminating Project Presented to the Faculty of the Graduate
School of Lindenwood College in Partial Fulfillment of the
Requirements for the Degree of Master in Business Administration

1998

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Preface

A strong, unparalleled economy in the United States from the late 1980's through the first seven years of the 1990's, coupled with a steadily increasing population has created an exceptional market for new homes and businesses. In a market where the demand for buildings is strong, builders try to find ways to build as quickly and as inexpensive as possible. The faster a builder can erect a building, the quicker he or she can be paid for that building and then move on to another project.

Component manufacturing has been an area of tremendous growth in the United States. Builders can erect components to accomplish a structure much more quickly than building the same structure with stick lumber. Components also are engineered, so they are consistently more structurally sound than a common stick building. Trusses are a component which are used to produce the roof system of a home or small commercial building. Trusses are widely accepted, being used in as many as 85% of homes in some areas of the country. In all areas, the cost savings and structural integrity of trusses are causing them to gain market share. The use of trusses has even expanded into floor systems, potentially doubling the truss market for manufacturers whom produce floor trusses as well as roof trusses.

The growing economy is creating a growing truss market. This growing demand for trusses creates a good opportunity for new truss manufacturing plants to enter the market. It is premature for a company to blindly enter a market. A company should, instead, have a well-developed plan based on

industry research. This developed plan is called a business plan and will provide the basis for acquiring investment capital as well as blueprint for the operation of the new business.

The following thesis contains the research on the truss manufacturing industry in the St. Louis metropolitan area. This research was tabulated and then results were used to create a business plan for a truss manufacturing plant in the St. Louis market.

Chapter I

Introduction

An important indicator of the US economy is the number of new housing starts during a given period (Figure 1). When the economy is strong, housing starts are usually high. Private housing starts in September of 1996 were up sixteen percent (+/- 5%) from those in September of 1995 (United States Commerce Department). During the first ten months of 1996, 1.268 million housing units were started compared with 1.154 million units for the same period in 1995. This is an increase of ten percent (+/- 2%) from 1995 to 1996, and shows a continuing trend toward more new home construction. Housing starts in the mid-west have followed the trend of starts in the US as a whole. For the one-year period of September 1995 through September 1996, housing starts in the mid-west have been 18.78% of total US housing starts. Mid-west housing starts in the same one year period were as low as 16.71% of the US total housing starts, and were as high as 21.83% (United States Census Bureau).

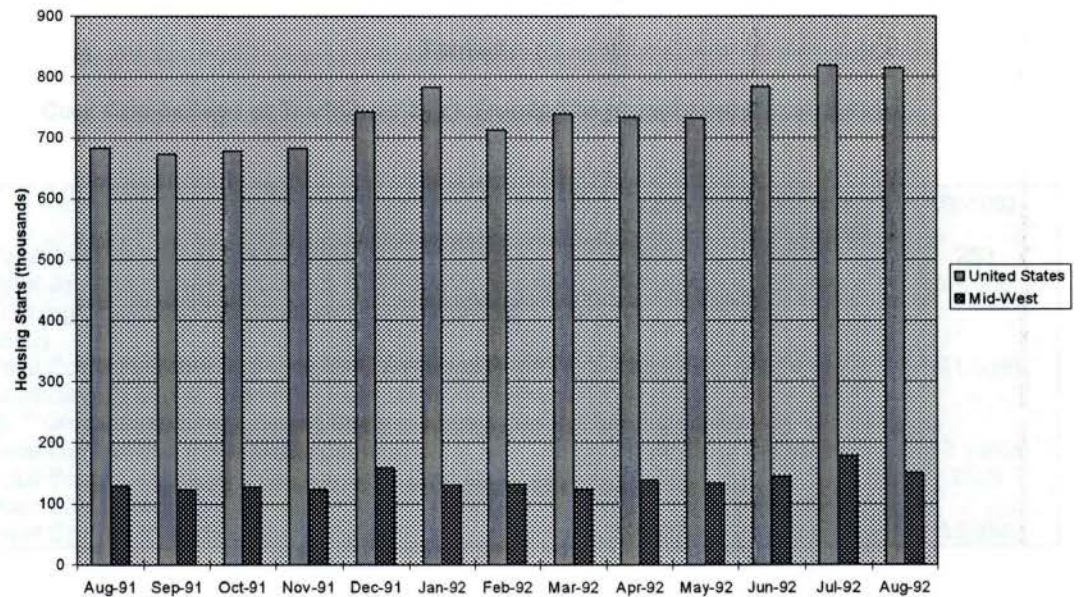
A high level of housing starts means increased business for builders and the companies that supply the building products. To increase business and efficiency, builders always try to find ways to build buildings more quickly. The more buildings that can be finished mean higher volume of sales for a builder, and, in theory, more profit.

Traditional methods of wood construction include stick building the frame, then stick building a roof system. Stick building is the process of taking single pieces of lumber and connecting them together for the required structure. Stick building usually requires the use of rafters, or beams, for smaller boards to

tie into. Trusses are intended to replace the time consuming process of stick building a roof system. Trusses are engineered members designed to use less material and less labor to transfer a given load from a roof, through the walls, and into foundation on which they sit. Trusses are assembled off the job site based on plans of the building they are for, and then simply erected onto the structure. Roof plywood is applied directly to the trusses, and the building can be closed in much less time than it would take if the roof system were built by traditional stick building methods.

Figure 1

New Houses Sold (Sept-96 thru Sept-97)



Source: US Commerce Department's Bureau of the Census and the US Department of Housing and Urban Development.

At least one study has been done that compares material and labor costs of traditional stick building methods of construction to erecting pre-fabricated building components (Table 1). The extra cost of the pre-fabricated components, in the test, was more than offset by the reduction in labor costs realized at the job site. The Wood Truss Council of America (WTCA) conducted a test they called "Framing the American Dream." In this test, two identical homes were constructed next to each other. One of the homes was constructed using traditional stick framing, while the other was built with pre-fabricated components (trusses and wall panels). The total savings realized in constructing a 2600 Sq.Ft. home with components instead of stick framing is \$3,356 (WTCA, Framing American Dream).

Table 1:
Cost Comparison of Traditional Stick Framing to Component Construction

	Stick Frame	Trusses & Wall Panels	Savings
Total Job Site Man-Hours to Erect	401	148	253
Total Job Site Man-Hour Cost @ \$20/Hour for Average Framing Crew Labor (Components used Crane @ \$500)	\$8,020	\$3,460	\$4,560
Total Cost of Lumber @ \$450/MBFT (Average) Sheathing @ \$3,748 (Same for Both) and Components @ Truss Manufacturer's Selling Price	\$12,928	\$14,457	(\$1,529)
Total Lumber and Panel Scrap Generated	17 yards	4 yards	13 yards
Total Scrap Cost @ \$15/Yd. Dumpster Cost and Man-Hour Cost to pick up	\$425	\$100	\$325
Total Cost for this 2,600 Sq. Ft. House Plan	\$21,373	\$18,017	\$3,356

Source: Wood Truss Council of America, 1996 Test "Framing the American Dream."

Most buildings are made up of structural members, including trusses, which are engineered components requiring design and/or approval by a

qualified engineer (Diab). Software development in the early 1990's has made it possible for a designer to develop an engineered roof system simply by using design software. The software can analyze the truss components in a roof system to determine if they are adequate for their intended use. Building codes can often require that an engineer gives final approval of a truss. By using design software, a technician can design a truss component and send it to an engineer for approval. Approving a current truss component takes less of an engineer's time than designing the structure does. By requiring less time of the engineer, tremendous cost savings can be realized, making the use of trusses even more cost effective when the location of the structure has a governing code which requires an engineer's seal (Wert).

There currently are about 2000 truss manufacturing plants in the United States (Marriot). These plants primarily produce structural trusses for residential and wood commercial buildings. The responsibility of these manufacturing plants range anywhere from providing individual trusses for a building based on given verbal specifications, to designing entire roof systems, including beams, girders, and non-structural fillers, based on architectural drawings. Most truss manufacturing plants are equipped with software that provides them with the ability to quickly generate a truss profile for a given roof. This profile can then be analyzed, using engineering software, to determine if it will be adequate to support the weight that will rest on the component. The development of this design software has made it possible for truss manufacturing plants to be able to design trusses quickly and accurately, without having to employ a full time professional engineer. The companies that supply the design software to the

truss manufacturing plants often will provide, as an additional service, a professional engineer's seal on truss drawings developed from their software.

Since 1993, the seasonally adjusted rate of new housing starts has stayed relatively steady at around 1.3 million new starts annually. Of these 1.3 million new starts, single family homes make up approximately one million, or 77%. The projections for 1997 and beyond are that slightly higher interest rates will slow the growth of new housing starts, but the annual rate is not expected to decline (Western Wood Products Association). The truss industry holds approximately fifty percent of the new home market, meaning that about one-half of new homes are built with trusses, and one-half are built with conventional stick framing methods. Due to the use of trusses gaining acceptance, slower housing starts do not necessarily mean slower growth in the truss industry. The percentage of new home starts using truss systems is expected to continue to grow. The truss industry should continue to see its market grow at a rate faster than the rate of new homes constructed (Marriot).

At the end of 1993, the WTCA took a census of truss manufacturing plants to find data on plants that are currently operating in the US. Of the approximately 2000 plants operating in the US, 33.3% of them had annual sales of under three million dollars, fifty percent had annual sales between three million dollars and six million dollars, and 16.7% had annual sales of over seven million dollars (Financial Performance, 4).

The average truss manufacturing plant realizes a net gain, before taxes, of \$170,970 (WTCA, Financial Performance). Based on the WTCA survey, the average truss plant showed a pre-tax profit margin of three percent, or \$170,972. Truss plants with annual sales between three and seven million dollars fared the

best, with a pre-tax profit of \$229,331 for a margin of five percent, while companies with sales greater than seven million dollars and companies with sales less than three million both showed an average pre-tax profit margin of two percent, or before tax profit of \$272,412 and \$32,713 respectively (pre-tax profit margin is determined by dividing the net income before taxes by the net sales). Return on total assets, as an average for all truss plants, was ten percent, and return on equity was nine percent. These are both measures that indicate truss plants, as an average, had a strong year in 1993. Current debt to stockholder's equity, as an average, was 0.89. The current ratio for all categories of truss plants is an impressive average of 7.6, with the smaller plants at 2.7 and the larger plants at 5.8 (current ratio is found by dividing a companies current assets by their current liabilities).

Builders that use truss members as their primary method of roof and floor construction often depend on the truss manufacturer to design and manufacture all the trusses, girders, and engineered beams for a given building (Figure 2). The average truss manufacturing plant has sales made up of approximately seventy percent roof trusses, fourteen percent floor trusses, and the remaining sixteen percent of sales are miscellaneous engineered products (WTCA, Financial Performance).

Based on a lecture given by Dick Marriot, and data received from John Kowalik, it can be concluded that equipment available to truss manufacturing plants is efficient, high-tech, and expensive. The startup cost of an operational truss manufacturing plant could be a strong deterrent for companies and individuals trying to get into the truss manufacturing business. To start a new truss manufacturing plant, the following items are required:

- Land on which to place the plant
- Buildings for offices
- Buildings for truss manufacturing
- Covered areas for lumber/truss storage
- Steel connector plates and lumber to be used to create trusses
- Design software and computer equipment for the design of trusses
- Truss building equipment
- Trucks for the delivery of the finished product.

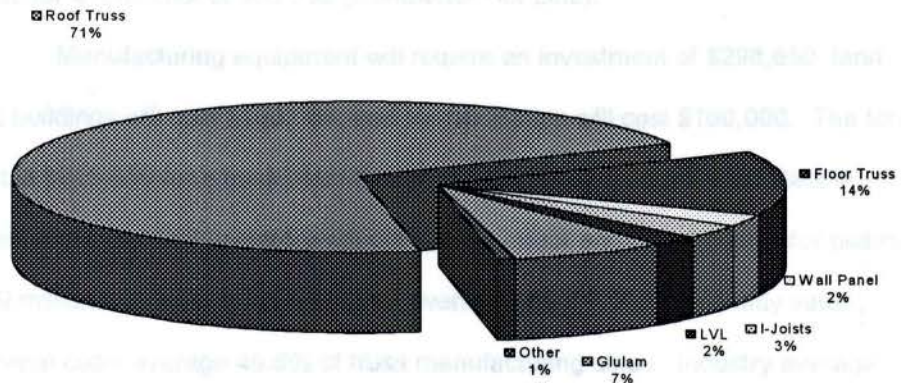
The cost for each of these items will vary depending on location and predicted volume that the truss plant will need to handle. This analysis will assume a truss manufacturing plant with annual sales volume equal to the average annual sales of truss plants surveyed in the 1993 WTCA financial performance survey. The average truss plant has sales of approximately \$4.9 million. Of this \$4.9 million, \$3.4 million will be from the sale of roof trusses, \$.68 million from the sale of floor trusses, and all other engineered components (I-joists, wall panels, etc.) will make up the remaining \$.82 million.

Required truss manufacturing equipment would include a large component saw for high volume work, a small component saw, a clincher to install plates, and a roller gantry to finish the truss. A large component saw will currently cost \$123,000, and a small component saw will cost \$12,650. The clincher required for the truss plant will cost approximately \$15,000, and finally the roller-gantry unit will cost \$130,500. The manufacturing equipment is computer controlled, and is connected to personal computers that run truss design software. The average truss plant will need enough computers to design nearly \$5 million in trusses each year, plus run software for the general management of the company. Two personal computers will be used for truss design, two more will be used for management personal and one personal computer will be purchased to network the other four computers and the

component saw. Laptop computers are often used by salesman for on-site quotes for customers. The average truss plant will require two laptops. This is a total of seven computers purchased, at a cost of approximately \$17,500. The type of equipment used in operating a truss manufacturing plant is crucial in ensuring an efficient and competitive operation. Incidental equipment is also required, but the cost should be insignificant as compared to cost of the primary equipment, so it will be ignored (Kowalik).

Figure 2:

Percentage of Sales per Item For Typical Truss Manufacturing Plant



Source: Wood Truss Council of America, 1993 Financial Performance Survey

Truss plants are usually located as much as fifty miles outside suburban areas. The average cost of land in an area fifty miles from a major metropolitan

area will be assumed to be \$7500 per acre, and eight acres will be required, for a total cost \$60,000. Large warehouses are used to store equipment and assemble trusses. Metal warehouses, 40 feet wide by 60 feet long will cost \$25,000, including a concrete slab floor. A small office building will be constructed next to the manufacturing building at a cost of \$50,000 (Post Frame Steel). Lumber storage sheds will also be used, at a total cost of \$25,000 (Jost).

Trucks and forklifts are the final item of equipment required for an operational truss manufacturing plant. Two tractor-trailers and one flat bed truck will be used to deliver the finished good. The total cost for trucks and trailers will be \$100,000, assuming used equipment is utilized (Adelman's). Forklifts will cost less. Two forklifts capable of handling large bunks of lumber will be \$30,000 each, for a total cost of \$60,000 (Contractor Hot Line).

Manufacturing equipment will require an investment of \$298,650, land and buildings will cost \$160,000, and transportation will cost \$160,000. The total cost is \$618,650 for a truss plant designed to produce \$4.9 million dollars in sales. Raw material inventory will consist of lumber and metal connector plates. \$4.9 million in annual sales will be an average of \$408,000 in monthly sales. Material costs average 49.6% of truss manufacturing sales. Industry average inventory turnover is 6.8 times annually. The initial inventory will be seven and one-half weeks worth, or \$716,000 (WTCA, Financial Performance). An average sized truss manufacturing plant will require an average initial investment of \$1.3 million.

In the past, the failure rate for newly formed small businesses has been as high as eighty-five percent. In the 1990's, the largest job growth in the US has been newly formed businesses with twenty or fewer employees (Haugen 1).

This job growth has created a new priority by government agencies to help small businesses survive and expand. Business incubator programs have been developed which try to give newly formed companies every opportunity to succeed. Often, a place to operate at a reasonable cost and resources that can provide expert advice are provided through incubator programs. Once the company has stabilized, it is encouraged to become more independent, either by an agreement to receive services elsewhere, or substantially higher charges for the services provided by the incubator. The incubator can then devote its resources to help more new businesses.

No empirical data could be found which has determined the success/failure statistics for truss manufacturing plants specifically. MiTek industries, the world's largest supplier to the truss manufacturing industry, has not found it necessary to write off substantial amounts of bad debt due to plant closings (Beckel). MiTek supplies connector plates and manufacturing equipment to almost one-half of the truss manufacturing plants in the US. This is a sufficient sample to confidently state that truss manufacturing plants have a high success rate. Due to all the variables involved, and the different types of business failures, it is virtually impossible to find a specific percentage of businesses which fail when compared to businesses started. A review of literature infers that the failure rate of businesses, as a whole, must be in the range of twenty-five to forty-five percent (Lussier 3).

Employment opportunities created by a truss manufacturing plant are numerous. Sales per employee, as an overall average, is \$80,980, so truss plant with sales of \$4.9 million annually would employ sixty people. Positions held within the truss manufacturing plant would include salespeople, a technical staff,

a support staff, management, and production employees. As an average, a truss plant has four salespeople, a technical staff of five people, forty plant employees, and the remaining twelve employees consist of management and support personnel. Plant positions include delivery drivers, manufacturing personnel, forklift operators, and similar labor intensive positions (WTCA, Financial Performance).

This paper is intended to thoroughly analyze the current building market and building trends that are occurring, as they relate to engineered lumber products. The companies that currently supply these engineered lumber products will also be analyzed to determine how the company operates. Once the analysis of these companies is complete, this paper will present a business plan for starting a company to compete with existing companies in this field. Aspects of the company such as location, customers, and markets will be considered in the business plan. The strengths of current companies will be considered, and then the business plan will build upon these strengths for what will ideally be a plan for a company superior to those supplying the same markets.

Chapter II

Literature Review

Homes and small commercial buildings in the mid-west, particularly in the St. Louis metropolitan area, are most commonly built by stick framing the walls, utilizing wide (eight inches or larger) dimension lumber in the floors, and using truss components for the roof. There are approximately nine companies that supply roof trusses to builders in St. Louis and its surrounding areas. Of these nine companies, at least three have been built within the past five years. The increase in roof truss use in the St. Louis area accompanied with an increase in housing starts (United States Census Bureau) has allowed for established truss manufacturing plants to continue to operate, as well as for new plants to enter the market. Roof truss use has increased at a rate greater than that of housing starts. As builders become more familiar with the use of roof trusses, their use will continue to increase. Familiarity with roof trusses will increase the use of floor trusses. Floor trusses can potentially double the current truss component market. Environmental concerns continue to cause the price of lumber to increase, which also will help to increase the use of floor trusses. As floor trusses become more cost effective as compared with dimension lumber, their use should increase substantially (Marriot).

No matter how small or how informal, all firms are engaged in some sort of business planning (Crego 2). Business planning is determining a set of management decisions for what a firm must do to be successful. Often, these management decisions are expressed in document form and referred to as a

company's business plan. The business plan a company develops will be organized into five major strategies (Crego 10):

- Market strategy
- Production/service strategy
- Research and development strategy
- Organization and management strategy
- Financial strategy

The market strategy of a truss manufacturing plants business plan will include whom the target customer will be, and how that customer will be reached. The products and services which the manufacturing plant will provide, the pricing strategy for these products and services, and distribution issues will also be part of the plants marketing strategies.

The production/service strategy is the process and the technology that will be used to produce and deliver the finished products. The resources that will be required to produce the finished good, such as raw materials and labor, are included in the production strategy. A production schedule to provide finished goods at a rate comparable to the sales goals will also be addressed in the production strategy.

The research and development strategy will be one of the most important areas addressed by the business plan for a manufacturing plant. New technologies are constantly developed to allow for structures to be built more quickly and at less cost. The research and development strategy will set guidelines for the manufacturing plant to maintain a competitive edge by providing the most efficient products and designs. The research and

development strategy will also give trends in the target market and the environment that the firm will operate in.

Organization and management strategies will provide for the manufacturing plant to place qualified individuals into positions to implement the business strategies. Organization and management strategies will include functions to be performed and who will perform them, the organization of the functions to promote overall effectiveness, efficiency, and productivity, and the procedure for motivating and controlling the operations of the firm.

The financial strategy of the business plan will address three critical questions:

- 1) Are the business operations managed to generate adequate profit and ensure ongoing economic viability?
- 2) How are excess revenues or profits to be used?
- 3) How will basic operating funds and funds required for key investments be generated?

Items that will determine the answers to these questions will include company policies regarding payment and collection, cash flow concerns, value and usefulness of assets, and liquidity of assets (Crego 21). By resolving the above questions, the financial position of the company can be determined. This position is important because it will determine if all the other aspects of the business plan are adequate to produce a successful manufacturing plant.

To create a business plan to meet all the requirements specific to a particular industry, research must first be done to find out how companies which are already in that industry operate. The business plan should not be just a reflection of how other companies in the industry operate. The business plan should, instead, build on positive aspects of current operations to attempt to

create a company that will operate more efficiently. Industry data on current company sales, profits, expenses, and organizational structure are important to create a business plan for a new company.

A business plan is used to provide the framework for how a company operates. In most cases, a business plan can also be a requirement for an individual or group that is trying to get funding to begin a new business (Mancuso 13). The business plan for a company, which is presented to potential investors, must be appealing, or it will not get the support to become a reality. As discussed previously, the business plan is a way for an individual to take an objective look at how his or her company will operate, and what steps to take to work toward its success. A second use of a business plan for a new company is the means for communicating one's ideas to others and providing the basis for one's financial proposal (Mancuso 43).

The organizational structure of a firm is critical to the success of that firm. A company must have strong management supervising the operation of a company, but it must be made up of individuals who work together toward the fundamental goals of the organization. The type and the mix of the work force employed in the organization is also critical. The employees must be trained to produce the goods manufactured or to provide the services that the company provides. In the case of a truss manufacturing plant, some technical expertise is required in every stage of production, from selling a truss to the actual manufacturing of the truss. Administrative operations critical in any type of business, such as accounts payable and accounts receivable, are also positions that must be filled by qualified persons.

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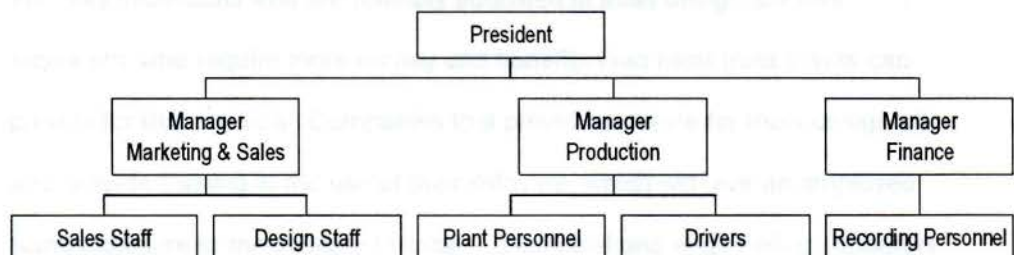
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The organizational structure of a truss manufacturing plant would be that of a simple, functional organization. The basic organizational structure for the truss manufacturing plant is as shown in figure 3. The truss manufacturing plant's organizational structure will have the manager of sales and marketing over the design department. The organization is set up in this manner so that the primary focus of the manufacturing plant will be customer service. The individuals making up the sales staff and the design staff are the individuals who deal directly with the customers. By having the design staff work directly under the head of sales and marketing, alongside the sales staff, the importance of servicing the customer will be better communicated within the company. The alternative to this organization is to place the truss designers in a purely technical role, working under a manager of technical personnel.

Figure 3:

Truss Manufacturing Plant
Organizational Chart



The qualifications of the individuals filling the required roles in a truss manufacturing plant, or any organization, are crucial to the success of the organization. The manager overseeing the sales and marketing aspect in the organization described above should not only have skills in basic sales and

marketing, but also experience in wood construction, primarily construction with trusses. The sales manager will be responsible for ensuring the sales staff is offering their products to the intended market, and that the design staff is providing accurate, competitive designs. The sales and marketing manager will also be responsible for ensuring that the design staff does the research and development necessary to keep the firm competitive.

The construction of the trusses will be supervised by the production manager. The production manager will need to be an individual who is able to motivate manual laborers to work efficiently. The laborers will tend to be unskilled workers who will be required to follow drawings. The production manager will be responsible for the training of these workers and the accuracy of the product they put out.

Technical personnel who are responsible for the design of trusses, and for customer support, will need to be trained individuals. Training for truss designers has long been a problem for truss manufacturing companies (Rogers). The only individuals who are formally educated in truss design are civil engineers, who require more money and benefits than most truss plants can provide for that position. Companies that provide software for truss design often also provide training in the use of their software, which will give an employee some exposure to the design of trusses. Technical and engineering support is also supplied by the software companies, which give truss designers a place for help when problems arise.

The manager of finance will be the individual who is furthest removed from the product the truss plant will create. The finance manager will be an individual who can effectively bring about the financial health of the organization.

Cash flow, payables, and receivables are the items which are the most critical to a new organization, and the finance manager should be able to effectively oversee these areas (Crego, 43).

As discussed in chapter one, wood construction is an extremely competitive industry. Industry suppliers are continually providing products that make it possible to construct a building more quickly than the competition. The time saved by using components for construction is completely eliminated if the delivered component does not fit the building as it should, or if the component is damaged. The perception that a truss manufacturing plant attempts to achieve is that the plant will supply quality, accurate truss components, which are assembled and delivered on time. For the reasons discussed previously, it is critical that a component manufacturing plant is recognized for products that are high quality and do not require field modifications. Modifying a truss at the job site costs engineering fees, extra material, and most importantly, extra time. Builders will be willing to acquire trusses at a premium price if there is some guarantee that they will be right the first time, and even if they are not, that they will be modified quickly. The philosophy of business for a truss manufacturing plant, therefore, will be to project the image of high quality, accurate products, with technical support that will immediately remedy any problems. This philosophy will result in a truss component that is priced higher than competitors components, but will ideally result in higher customer loyalty and lower charges for incorrect components (Marriot).

The cost for equipment for an operational truss manufacturing plant, as itemized in chapter one, is \$618,650. In addition to material and equipment start-up costs, capital will be required to begin the truss manufacturing plants

operations. The WTCA financial performance survey gives a breakdown of operating expenses for an average truss manufacturing plant. Direct labor costs and manufacturing overhead, assuming a plant with \$4.9 million in annual sales, is \$1.1 million annually. The direct material cost is \$2.4 million annually. Delivery expense, selling expense, engineering expense, depreciation expense, and bad debt expense combine for \$1.0 million in operating costs (Financial Performance, 11).

The average collection period for accounts receivables is 38.1 days (WTCA, Financial Performance, 24). A new truss manufacturing plant will have to supply trusses to its customers for an average of 38.1 days before any payment is received. The initial cost of inventory includes enough material to provide trusses for this period, however, personnel cost also need to be considered. Direct labor and material costs for the production of trusses is \$1.14 million, which will be \$119,324 for every 38.1 days. Miscellaneous expenses for the same 38.1 day period will total \$113,462 (based on an annual expense of \$1.08 million x (38.1 days / 364 days/year)). \$232,786 will be added to the startup costs to reflect the cost of operation of the truss manufacturing plant. After the first 38.1 days, the truss plant will be able to finance daily operations by payments received for goods delivered (WTCA, Financial Performance, 11).

Tables 2 and 3 show the balance sheet and income statement, respectively, of a truss manufacturing plant in 1993 with industry average annual sales of \$4.9 million.

Table 2

Truss Manufacturing Plant, Income Statement for 1 year period.

Income Statement:	Average for all Companies Reporting
Gross Sales	
Roof Trusses	3,742,273
Floor Trusses	740,667
Wall Panels	131,271
I-Joists	162,052
LVL	123,024
Glulam	45,762
Other	39,353
Total Gross Sales	4,984,402
Discounts & Allowances	53,242
Net Sales	4,931,160
Cost of Goods Manufactured	
Direct Material Cost	
Lumber	1,869,510
Plates	305,289
Staples, Nails & Hardware	43,563
Other Materials	30,592
I-Joists	105,028
LVL	54,661
Glulam	37,228
Total Direct Materials	2,445,871
Production Costs	
Direct Labor Costs	603,541
Manufacturing Overhead	538,686
Total Production Costs	1,142,227
Total Cost of Goods Manufactured	3,588,098
Expenses	
Delivery Expense	258,784
Selling Expense	225,968
Administrative Expenses	383,794
Bad Debt Expenses	11,551
Engineering Expenses	163,417
Depreciation Expenses	41,115
Total Expenses	1,084,629
Net Operating Profit (Loss)	258,433
Less: Interest Expense	47,246
Other Non-operating Income (Expense)	40,217
Income (Loss) Before Taxes	170,970

Source : WTCA 1993 Financial Performance Survey.

Table 4 gives various operating ratio's for the truss plant described in tables 2 and 3. Indicators that a company is financially secure can be derived by performing ratio analysis on information in a company's financial reports. Profit margin before taxes is an immediate indicator as to whether or not the company

is profitable. Return on equity (ROE) is another measure of the profitability of a company. Return on equity is determined by dividing net income before taxes by stockholder's equity. This is the income yield in relation to the amount of capital invested by stockholders. The larger the ROE is, the more money the company is earning for its owners. Return on total assets (ROA) is the measure of the productivity of total assets. A large number indicates the company's assets are working well toward the profitability of the company. A small or negative ROA indicates an inefficient operation. The average truss manufacturing plant shows an ROA of ten percent, or 0.10 (Table 4), which indicates that the average truss manufacturing plant uses its assets well. Solvency of the company can be determined by the ratios of stockholder's equity, creditor's equity, debt to equity, and current debt to equity. Stockholders equity is the ratio (or percentage) of the total resources which are provided by the stockholders. A ratio near one (or 100%) indicates that the majority of resources are provided by stockholders while smaller numbers indicate more resources are a result of liabilities. Creditor's equity, or liabilities, is directly related to stockholders equity. Equity, or resources, are either owned by the stockholders, or are a liability. Creditor's equity ratio near one (100%) is an indication that the company is borrowing large amounts of capital to operate. Debt to equity and current debt to equity are both measures of a margin of safety to creditors, or the ability of the company to withstand unfavorable business conditions. Debt ratios greater than one indicate the company is financing its operation with more debt than equity. This is appealing to stockholders because a profitable company is earning money for the stockholder, not only with the stockholders money but also with borrowed money. To a creditor, a number over one indicates some risk that the debt will not be

recovered. Debt to equity of 1.4 is appealing to stockholders, while current debt to equity of 0.89 indicates that the company is able to guarantee any short-term debt will be satisfied. Current ratio, sales to working capital, inventory turnover, and average collection period are all indications of how liquid the company is. Current ratio measures the solvency of the company. Current ratio is determined by dividing current assets by current liabilities. A current ratio greater than one indicates a solvent company. Current ratio trends are another indicator of the financial health of a company. Steadily decreasing current ratio indicates the company is borrowing more funds, or is paying its bills more slowly. Sales to working capital is a measure of how efficiently working capital is employed. Inventory turnover is the number of times per year that the companies inventory is replaced. The greater the number of times the inventory is replaced, the less interest is paid by having idle inventory. Average collection period is the effectiveness of collection efforts. A short collection period indicates a liquid company (Brigham 47-59).

Forecasting the sales for a truss manufacturing plant is based on the predicted number of housing starts for the geographical area that the truss manufacturing plant operates in. Competition, markup, raw material costs, and other marketing factors will have an effect on sales for a truss plant, but the major determinant for this type of company is how much new construction is available. Historically, housing starts and other new construction are directly related to interest rates. When interest rates are low, as they have been in the early 1990's, new housing starts are high. Higher interest rates result in less borrowing and fewer new homes and small commercial buildings, so fewer building materials, including trusses, are purchased. The growth of the nation's

economy is, to some extent, based on interest rates. Many forecasting methods are used to predict whether or not interest rates will go up or down, and it is usually known well in advance what the federal government is going to do with federal interest rates. Accurate forecasts of new housing starts, and subsequent annual sales, will be feasible for a truss manufacturing plant.

Table 3

Truss Manufacturing Plant, Balance Sheet for 1 year period.

Balance Sheet:

Assets

Current Assets

Cash	111,719
Accounts Receivable (net Doubtful)	520,411
Accounts Receivable - Other	24,172
Raw Materials Inventory	428,768
Finished Goods Inventory (Including Work in Process)	75,231
Other Current Assets	35,072
Total Current Assets	1,195,373

Non-Current Assets

Net Fixed Assets (net Depreciation)	508,475
Intangible Assets	10,594
Other Non-Current Assets	85,074
Total Non-Current Assets	604,143

Total Assets 1,799,516

Liabilities

Current Liabilities

Accounts Payable	236,872
Accrued Taxes - All Tax Obligations	62,028
Current Long-Term Debt	115,414
Current Notes/Loans Payable to Shareholders	136,427
Other Current Liabilities	119,685
Total Current Liabilities	670,426

Non-Current Liabilities

Long-Term Debt	243,816
Long Term Notes/Loans Payable to Shareholders	121,758
Other Non-Current Liabilities	15,821
Total Non-Current Liabilities	381,395

Total Liabilities 1,051,821

Stockholder's Equity 751,190

Total Liabilities & Stockholders Equity 1,803,011

Source : WTCA 1993 Financial Performance Survey.

Table 4

Operating Ratio's for a Truss Manufacturing Plant.

Ratio Analysis:

Profit Margin Before Taxes	0.03
Return on Equity (ROE)	0.09
Return on Total Assets (ROA)	0.10
Net Sales to Total Assets	2.74
Sales per Employee	80,980
Sales per Plant Employee	125,953
Sales per Square Foot Production Space	186
Sales Per Sales Staff	1,227,722
Sales per Technical Staff	947,201
Stockholders' Equity	0.42
Creditor's Equity (Liabilities)	0.58
Debt to Equity Ratio	1.40
Current Debt to Equity Ratio	0.89
Current Ratio	7.60
Sales to Working Capital	5.30
Inventory Turnover (times per year)	6.80
Average Collection Period (days)	38.10

Source : WTCA 1993 Financial Performance Survey.

While annual sales of a truss manufacturing plant can be based on new housing starts, a truss plant will be better off by having some control of its own future. Currently, roof trusses are used on about fifty percent of all new homes in the United States. Floor trusses are used in substantially fewer homes than roof trusses. The opportunity exists for the sales department to increase the sales of trusses, even with a housing start slow down. Introducing contractors and owners to the time and money which can be saved by using roof and floor trusses should increase the percentage of homes which use trusses. This will result in increased sales for a truss plant, independent of housing starts.

The income statement in table 2 shows the primary expenses of a truss manufacturing plant. The average truss manufacturing plant, in 1993, had \$163,417 of engineering expenses. This figure is what it costs the truss company to provide truss drawings with an professional engineer's seal, and any research and development costs the plant might have had. Facilities required for

plant research and development will be minimal. Any research and development that a truss manufacturer would perform would include assembling trusses with existing equipment. Testing of these trusses then could be done by contracting with the truss plant's plate supplier to use their testing facilities. Plate suppliers are already set up with testing equipment that will model long-term and short-term loading on a truss to model real life conditions (Diab).

The truss manufacturing plant will assemble structural trusses from raw materials. Raw material required to assemble trusses include steel connector plates, dimensional lumber, and steel channels (if steel trusses are also going to be assembled). Connector plates are pre-manufactured products that are used to tie lumber members together. Plate manufacturing is a competitive industry, with at least four major companies supplying plates to truss manufacturers all over the United States. Finding a supplier of truss plates will not be difficult. Plate manufactures also supply the material required to assemble light-gauge steel trusses. Lumber suppliers are also numerous, making lumber a readily available commodity for the truss manufacturing plant. Roof and floor trusses, both steel and wood, will be products which are produced by the truss manufacturing plant. Engineered lumber items, which make up about twelve percent of annual sales, cannot easily be manufactured by the truss plant and will need to be purchased from another manufacturer. Lumber suppliers often offer engineered lumber products to their customers, so the truss plants lumber source can also be the source for engineered wood products (Jost).

Unemployed truss designers are often difficult to find (Rogers). In many cases, a truss plant must hire an individual with an interest in construction and invest the time and money required to make that person a good truss designer.

Because of the capital invested in truss designers, they need to be motivated to stay with the same company. Much of the motivation to work for the same company comes from the people that an individual works for and works with. Another factor is the compensation that the company awards the employee. To get and keep a skilled truss manufacturer, or any employee, they need to be paid competitively. The compensation an employee receives is not only in his or her paycheck, but the benefits which they get. Factors such as longer life expectancy and fear of inadequate social security has made pensions a high priority for many employees. In 1993, 94.4% of truss companies provide health care for its employees, 30.6% provide pension plans, 22.2% offer 401K investment plans, and 33.3% offer a profit sharing plan (WTCA, Financial Performance 26). The WTCA financial performance survey also revealed that virtually all (97.2%) of truss plants offered paid vacations and paid holidays for its employees (26).

Workers' compensation insurance is an expense that all manufacturing companies have. The cost of workers' compensation has increased over the past decade, largely due to lawsuits which have resulted in large settlements and the increased cost of Occupational Safety and Health Administration (OSHA) fines (Jaselskis 61). The average truss manufacturing plant pays \$84,621 for workers' compensation annually. This adds an average of \$1,779, per plant employee, to the cost of operating a truss plant (WTCA, Financial Performance 24).

The target market for a new truss manufacturing plant will be the residential and small commercial building in the St. Louis metropolitan area, with the potential of shipping trusses as far as 250 miles outside the St. Louis area.

As of September 1996, total single family housing starts for 1996 were forecast to be 819,000 in the United States, and total housing starts were estimated to be 1.45 million (United States Census Bureau). Single family housing starts for the midwestern section of the United States were estimated to be about eighteen percent of the total, or 261,000 total housing starts. Total residential building for the St. Louis metropolitan area, which include counties in the St. Louis vicinity in both Missouri and Illinois, was 4,694 starts the first 5 months of 1996, and 3,960 starts for the first five months of 1997 (Dodge report). Based on the first five months, total housing starts for 1996 was 11,266, and for 1997 the total will be slightly lower at 9,504 starts. It should be noted that housing starts are not uniform throughout the year, so basing an entire year on the first five months gives only an approximation of housing starts for the given year.

The average home which is built using truss construction requires \$5,000 worth of trusses (Jost). In 1997, if 9,504 residential buildings are constructed, and fifty percent of these buildings use trusses (Marriot), then the market size for trusses in the St. Louis area is almost \$24 million. If this market was divided evenly between the nine companies currently servicing this market, and one new truss plant, each truss plant would have sales of approximately \$2.4 million.

Existing truss plants in the St. Louis market currently can meet the demand for trusses. A new truss plant would not necessarily have business waiting for it. To be successful, or to even survive, a new truss manufacturing plant will have to operate better than the majority of the plants servicing the same market. Truss prices will need to be competitive, and service will need to be superior. To offer these two items to a customer, and still be profitable, the new truss plant will need to be more efficient than its competition. The new truss

plant will need to devote resources to capture a percentage of the existing market, as well as to entice builders who currently do not use trusses to try the product. If market estimates are correct, there is a potential of \$24 million in unrealized truss sales in the St. Louis area alone (Marriot).

Some truss companies currently operating in the St. Louis area distribute their product exclusively through lumberyards or large general contractors. Other truss companies will sell directly to a homeowner or small builder, but offer large discounts to the lumberyard or large contractor. At least one truss company sells its product to any customer for the same price, which has created an adverse attitude toward this company from at least one major truss distributor in the St. Louis area (Jost). Based on this research, a new truss company would be wise to limit the sale of its product to lumberyards and general contractors only. There has been at least one instance where a truss manufacturing plant created legal problems for itself by selling a roof system to an individual who did not have construction experience. The trusses were installed without following required lateral bracing requirements, and the structure collapsed (Atwell). By distributing trusses through lumberyards or contractors, the truss plant minimizes the risk of being responsible for an unqualified end user of its product.

Promoting the advantages of purchasing a truss from a new truss manufacturing plant verses existing truss manufacturing plants will be the key to capturing a percentage of the existing truss market. Advantages such as accurate designs so that field modifications will not be required, and a promise of one day return of sealed engineers drawings when field modifications or repairs are required. Sealed drawings in one day is a response time that many truss manufactures have attempted to provide, but cannot (Terbrock). Sealed

drawings are important because most jobs require that a municipal inspector approve phases of a project before the succeeding phase can be started. Sealed drawings for roof trusses, floor trusses, and any subsequent repairs are required before a house or building can be finished. If the building is not finished as scheduled, the building cannot be used or sold, and in the end it costs somebody more money. A professional engineer employed at the new truss plant will make one day turn around a possibility. An engineer would then give the new truss plant an immediate advantage over the truss plants currently in the St. Louis area, of which none have a professional engineer on staff.

Adequacy of design and performance of trusses is no longer an item that one truss plant can use as an advantage over another. Software development has become so advanced in the area of truss manufacturing that almost all truss manufacturing plants use software that is similar, if not identical to, its competition. Truss plants bidding on the same job will often design the trusses the exact same, so one truss plant is not necessarily better because of better trusses. Price, accuracy, service, and turn-around times are the only competitive factors left for a manufacturing plant (Terbrock). A truss plant which can provide excellent service and quick turn around time for jobs will be the truss plant that builders and lumberyards deal with.

The sales goals for the new truss manufacturing will need to be aggressive to ensure the company remains financially solvent. In the first year, the new truss plant will target lumberyards and builders, with the objective of capturing ten percent of the truss manufacturing market in the St. Louis metropolitan area. The objective of the design department will be to keep this percentage satisfied, so that they become repeat customers. In the second year,

the sales force will expand its target to include builders who do not use trusses, and lumberyards who do not sell trusses. The sales force will also try to expand sales by offering floor trusses and engineered lumber products to current customers. In an effort to attract customers of competing truss plants, the design department will provide technical advice and repair drawings for trusses provided by other truss plants. This will be done in the hopes that customers of other truss plants will appreciate the superior service and give some business to the new truss plant. Customer service will be the number one priority of the new truss manufacturing plant, so that once a customer uses it as a supplier once, they will not go back to their original supplier.

Chapter III

Methods and Evaluation

Materials

The function of a business plan for the startup and operation of a truss manufacturing plant is to create the foundation for opening a truss plant, and operating it successfully. The benefits of having a written business plan prior to the operation of any type of business are well documented. The business plan (Appendix A) provides a basis for the creation of a business and then direction for the business to move. A business plan will state goals which the truss plant will need to meet, and when those goals should be reached.

To start a business, one must have a product, a means of production of the product, and a market for the product. A business plan for a truss manufacturing plant will describe what type of products it will retail and what products it will produce. The production of trusses will require personnel to build trusses, equipment and material used to assemble trusses, and a market in which to sell trusses. A written plan is crucial to develop an organization which will be able to perform all these functions profitably.

As discussed in chapter two, all businesses are involved in some type of business planning. A business that has a written business plan will have an advantage over similar businesses without a business plan. This advantage will come because all aspects of running the business will be documented. The difference between operating with or without a business plan is that decisions made in a company without a formal plan are made independent of other aspects

of the business. With a formal business plan in place, all aspects of running a business are directed towards a common goal. Decisions made in one area of business, when employing a business plan, will work for the overall good of the company.

Subjects

The individuals who have evaluated the business plan for a truss manufacturing plant are persons who have been successful in the construction industry for an extended period of time. Evaluators were chosen to represent both the truss manufacturer's, and the end users. Truss manufacturers were chosen so that the operation of the truss plant could be evaluated. Truss plants deal with a variety of people with a diverse range of experience in building. This is unique for a manufacturer, and can cause concerns which may or may not have been addressed in the business plan.

Dick Marriot, Vice President of sales and marketing for MiTek industries was one evaluator. Marriot has been dealing with companies in the truss industry for over 15 years. MiTek industries is a company which provides truss manufacturing plants with material, equipment, and software for every aspect of their operation. Marriot is responsible for developing and marketing products and services which will address current concerns of truss plants, and make them run as efficiently as possible. Truss plant owners and operators from all parts of the United States communicate their problems to Marriot and in many cases, count solely on him for solutions.

Gary Gannon, design manager of Wood Structures, Inc., is another evaluator of the business plan. Gannon has 22 years of experience dealing directly with individuals at all boundaries of the truss manufacturing business. Engineers and architects who specify loads and roof configurations, truss designers who create the truss system, and the building contractor who erects the trusses all have specific requests for a truss plant. Gannon is experienced in communicating with all these requests, and is knowledgeable in the best way to deal with engineers, contractors, and employees. His input is important in ensuring that the business plan adequately deals with employees and customers. The best way to have employees deal well with customers is to have managers deal well with employees, and Gannon will verify that the business plan indeed does reflect this.

John Scott, President of O'Neil Lumber Company, was the final evaluator of the business plan. O'Neil Lumber Company is a major supplier of lumber and other building materials for the St. Louis metropolitan area. O'Neil Lumber is made up of four lumberyards and one door company serving different areas of St. Louis. O'Neil has built large timber trusses in the past, but primarily purchases trusses from area manufacturers. When a lumberyard quotes a home or building, they are responsible for supplying all framing materials, including roof trusses. O'Neil deals with three of the St. Louis area truss manufacturers. Which manufacturer they buy from depends on availability, past experience, and price. Scott's input was helpful in determining whether or not the truss plant will be one which is appealing to customers. A successful building supplier depends greatly on repeat business. Scott's opinion was important because customer service should be a major focus in any new business. The services provided to

customers in the business plan were intended to create loyal customers, and Scott was chosen to verify this.

Instrument

The method used to evaluate the business plan was a survey. The survey (Appendix B) used a standard Likert scale, which ranged from 1, representing strongly disagree, to 5, which represented strongly agree. A neutral point could be chosen, represented by the number 3. The reason for using this scale was to take the objective opinion of the evaluators, which was qualitative, and assign a quantitative value to it.

The survey was designed to test if the evaluators felt that the business plan presented to them would be successful. The hypothesis tested was as follows:

The business plan presented to the subject matter experts (SME's) for the startup and operation of a truss manufacturing plant will be considered a plan that would result in a successful truss manufacturing plant, by the SME's.

and the null hypothesis was:

The business plan presented to the SME's for the startup and operation of a truss manufacturing plant will not be considered a plan that would result in a successful truss manufacturing plant, by the SME's.

Assuming the Likert scale with values from 1 to 5, with 3 being a neutral point, the statistical hypothesis is:

$$\bar{X} >> 3$$

and the statistical null hypothesis is:

$$\bar{X} \leq 3$$

The sample used to review the truss manufacturing business plan were individuals who continually deal with these types of companies. The way they deal with the truss plant is either by being an employee, supplier, or customer. A successful truss manufacturing plant must be able to deal well with all these elements.

Procedure

The survey was presented to the subjects with a cover letter. The cover letter (Appendix C) explained the purpose of the business plan, and how the results of the survey will be used. The business plan, letter, and survey were personally delivered to all three subject matter experts. The subject matter experts were asked to read the business plan and then fill out the survey at their earliest convenience. To read the business plan and fill out the survey was expected to take approximately 45 minutes. The subject matter experts were asked not to proceed until they have time to read the business plan and fill out the survey within the same time period.

Chapter IV

Results

As described in chapter three, the survey used to assess the business plan utilized a standard Likert scale. The Likert scale ranged from 'strongly agree' to 'strongly disagree,' with a neutral point. A value of five was assigned to questions which the evaluator answered 'strongly agree,' and a value of one was assigned to questions which the evaluator marked 'strongly disagree.' A value of three was assigned to questions which the evaluator answered 'neutral.'

The questions in the survey were separated so that results would cover five major areas of a truss manufacturing plant. Responses to each survey question, and which section the survey question relates to can be seen in table 5. Three of the survey questions were designed to gain input on how well the business plan covered the truss industry. One question concerned the hourly employees, four questions concerned the management personnel. The remaining questions were split up between marketing and finance, with ten questions dealing with marketing and nine questions dealing with finance.

The survey results are shown in figure 4. In three of the five sections, the evaluators felt that the business plan did thoroughly cover the section in question by giving the business plan a value greater than three. In the remaining two sections, the evaluators felt that the business plan did not thoroughly cover that section. The overall mean of the survey was slightly greater than three, indicating that in general, the evaluators felt the business plan was thorough.

Table 4

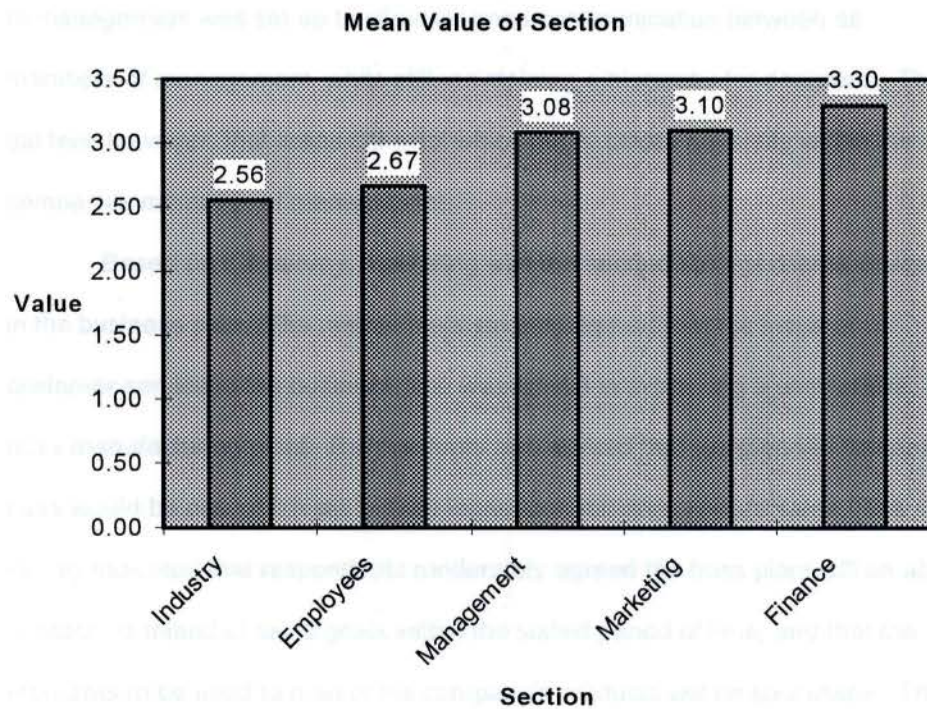
Survey Results - Business Plan for Truss Manufacturing Plant

Section	Question #	Response			Mean
		Survey 1	Survey 2	Survey 3	
Industry	1	2	2	3	2.33
	3	1	3	4	2.67
	17	1	4	3	2.67
Employees	2	2	2	4	2.67
Managemen	4	1	4	4	3.00
	5	5	4	4	4.33
	13	1	4	4	3.00
	14	2	2	2	2.00
Marketing	6	2	2	3	2.33
	7	3	4	4	3.67
	8	3	3	4	3.33
	9	4	4	5	4.33
	15	3	3	4	3.33
	16	3	3	4	3.33
	19	2	3	2	2.33
	20	2	4	2	2.67
	21	1	4	4	3.00
	25	3	3	2	2.67
Finance	10	3	3	3	3.00
	11	2	5	2	3.00
	12	5	4	5	4.67
	18	5	4	2	3.67
	22	2	3	3	2.67
	23	3	4	4	3.67
	24	3	3	3	3.00
	26	5	4	1	3.33
27	3	3	2	2.67	
Mean		2.67	3.37	3.22	3.09
Mode		3.00	4.00	4.00	3.00
Standard Deviation		1.27	0.79	1.05	1.09
Variance		1.62	0.63	1.10	1.18

The industry section dealt with the history of the truss manufacturing business, the end use of trusses, and the future of truss manufacturing. Survey

results indicated that the respondents felt the business plan did not go into enough detail about the history of the industry. The respondents indicated that a potential investor, with no previous knowledge of the building and truss industries, would need more background information before investing in a truss manufacturing plant.

Figure 4



Results of Survey Concerning Business Plan

One survey question dealt with the business plan's budget for compensation and benefits for hourly employees. Survey results indicated that

evaluators had no strong opinions on how the hourly employees were compensated with salary and benefits.

According to the evaluators, the issue of management in the business plan was covered more precisely than were the industry or the employees. They agreed that the members of management had well defined responsibilities. The respondents also felt that the members of management were informed and empowered to make decisions in the best interest of the company. The structure of management was set up to allow for good communication between all members of management, while still maintaining a hierarchy for decisions. They did feel, however, that areas did exist which might create adversity within the company's members of management.

Based on the survey, marketing was the second strongest area covered in the business plan. The respondents strongly agreed that the focus on customer service in the business plan was critical in producing a competitive truss manufacturing plant. Respondents also agreed that the planned customer base would be one which will set the foundation for strong future sales. The survey indicated that respondents moderately agreed the truss plant will be able to reach its intended sales goals within the stated period of time, and that the programs to be used to market the company's products will be successful. They also moderately agreed that the aggressive goals set in the business plan for annual sales and profits could be attained. The respondents agreed that an engineer on staff would be a competitive advantage for a truss plant, as suggested in the business plan. Programs described in the business plan to give the truss plant advantages over existing truss plants may not be enough to take significant market share. New incentives should be developed to ensure a new

truss plant could lure a share of the existing market, as well as capture new business. The respondents also indicated that the truss plant might be limiting its market somewhat by only selling its product to lumberyards and contractors. The belief that selling trusses only to lumberyards and experienced builders to reduce liability, as stated in the business plan, was not considered valid. The evaluators stated that any reduction in liability by limiting its target market would be offset by the truss plant having its own professional engineer seal truss drawings. Finally, the evaluators believed that more aggressive marketing techniques would be required to reach existing truss markets. More aggressive marketing techniques will also be required to educate builders on increased uses for trusses, in order to create new markets.

The respondents agreed most strongly with the financial aspects of the business plan. The belief that a new truss plant should acquire the best technology for the design and construction of trusses was strongly agreed with by two evaluators, and agreed to by the third evaluator. The respondents also agreed that the equipment listed to design and assemble trusses is sufficient to produce enough trusses for the expected annual sales. However, respondents did express concern that the land and buildings to be purchased for the truss manufacturing plant may not be sufficient for the truss plant.

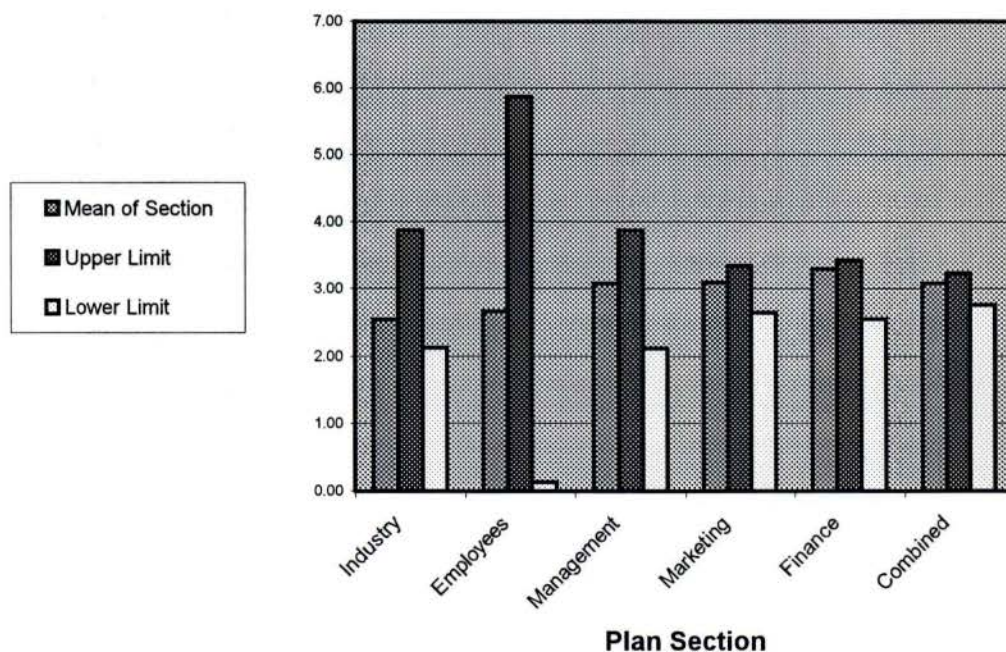
To obtain financing to make a proposed truss plant a reality, the business plan should inform potential investors about the final product. Respondents agreed that the business plan did provide adequate financial information to a potential investor. The business plan must also provide the potential investor with reasonable proof of the proposed rate of return, and the evaluators agreed that this was the case.

Capital for the operation of the truss manufacturing plant will be adequate until the truss plant can become self-sufficient. Once the plant is fully operational, cash flow allocations will ensure a financially solvent company. The respondents felt that the business plan's emphasis on informing a potential investor about the product and providing precise financial data was critical to obtain capital.

Although the feedback received from the evaluators was mainly positive, statistical analysis of the data failed to reject the null hypothesis. Figure 5 is the results of the statistical analysis performed on the data acquired from the survey.

Figure 5

T-test results



Results of Statistical Analysis performed on Survey

Due to the low number of respondents used, a standard T-test was utilized. The upper limit required to refute the null hypothesis, and consequently accept the actual hypothesis, is 3.24. The mean value of all survey responses was 3.09. Figure 5, in the first column for each section, displays the actual results of the survey. Columns two and three for each section are the upper and lower limit, respectively, required to reject the null hypothesis. In all cases, including the combined case, the actual values were within the range of the upper and lower limits. The business plan, therefore, cannot be statically proven to be one that will result in a successful truss manufacturing plant.

Chapter V

Discussion

Summary

The results of the questionnaire accompanying the business plan for the startup and operation of a truss manufacturing plant were mostly positive. The subject matter experts agreed with more items in the business plan than they disagreed with. Their agreement, however, was not strong enough to statistically support the business plan. Evaluators, in general, established that they agreed with the business plan in the areas of finance, marketing, and management, but disagreed in the areas of employees and industry. General comments made by respondents included concern that the truss manufacturing plant may have excessive liability and that the initial machinery purchases may not be correct for the intended sales volume. Also, the job description of management personnel may be too broad, and may need to be broken down further.

The business plan, before giving details of the truss plant, attempted to present an overview of the truss industry. Three questions in the survey attempted to give numerical values to how the readers felt the business plan dealt with this area. The mean value of the three survey questions dealing with survey was 2.56, indicating disagreement. The evaluators felt that the survey did not go into enough detail about the truss industry. Two respondents indicated that a potential investor, with little or no truss knowledge, was not given enough information to make an informed investment decision, while the third respondent felt there was enough information given. One respondent agreed that industry

information was accurate, one disagreed, and the third did not know. The revised business plan goes into more detail about trusses, how they are used, and why they are used. Discussing the price advantage which trusses have over conventional framing in buildings, with proven test results, was also included.

One survey question dealt with the hourly employees. The question asked whether or not employee compensation was adequate to provide good employee moral. One evaluator agreed that compensation was adequate, while the other two readers felt it was not adequate. Comments on this section expressed that more than good compensation is required for good employee moral. More programs to keep employees motivated to perform their jobs well are included in the revised business plan.

Overall results of questions dealing with management indicate that the readers were more positive than negative in their responses. Two respondents agreed that management is informed and empowered to make the necessary decisions to move toward a successful company. The third evaluator strongly disagreed. All respondents agreed that the members of management have well defined responsibilities. Comments, however, did state that the responsibilities might be too broad for one individual to handle. Two respondents agreed that the organizational structure of management allowed for good communication throughout, while still maintaining a hierarchy for important decisions. The third respondent strongly disagreed. All evaluators consented that the organizational structure might contain areas that could create adversity within the company. One respondent commented that the emphasis on customer service might compromise the integrity of the truss designers. The truss designers are responsible for providing safe designs. Too strong a focus on keeping the

customer happy may result in an inadequate design of a truss, or an entire roof system. All respondents agreed the focus on customer service is critical, and two respondents agreed that having the design staff work directly for the sales manager will reinforce the focus on customer service. The revised business plan does not change who the design staff answers to, but reinforces the idea that the trusses provided by the plant are safe.

Marketing is the third area of the business plan assessed by the survey. The first question dealing with marketing inquired if the evaluators believed the initial marketing plans were sufficient in today's construction industry. One of the respondents chose neutral while the other two respondents felt that the marketing strategy was not adequate for achieving an initial customer base. Once a customer base is established, all evaluators agreed that the market the truss plant will target is one that will provide a strong foundation for future business. Two of the three respondents were neutral when asked if programs presented in the business plan were adequate to make the new truss plant more appealing to customers than current truss plants. The third evaluator agreed that the programs presented would make the truss plant more appealing. They also agreed that the strong focus on customer service stressed in the marketing section of the business plan was important in today's construction industry. Evaluators also agreed that goals set in the marketing plan for company sales were reasonable, and that the time period stated to attain the sales goals were also reasonable. The business plan limited the truss plant's market to reduce liability, however, evaluators felt that some liability would still exist. Limiting the market would also limit the potential sales of the truss plant, according to the evaluators. Two of the three respondents agreed that the truss plant would have

a competitive advantage over existing truss plants by employing a registered professional engineer. The third respondent strongly disagreed that a registered professional engineer would be a competitive advantage. The final question dealing with marketing was generalized to include all marketing programs presented in the business plan. One respondent disagreed that the marketing programs presented would provide a competitive advantage, while the other two evaluators were neutral. The revised business plan contains more marketing plans to ensure that the truss plant can secure an initial customer base. Limiting the market to contractors and lumberyards is broad enough for the initial business. If truss plant sales are limited too much, as one respondent suggested, then the revised business plan must include provisions to open the market up to increase sales.

The financial section of the business plan was evaluated more positively by the respondents than any of the other sections. Evaluators answered neutral to both questions in the survey dealing with cash flow and initial operating capital. All respondents agreed that spending enough capital to provide the truss plant with the latest equipment for automated manufacturing is critical for the success of the company. Respondents also agreed that the latest design and manufacturing software is critical to the success of the truss plant. Two of the evaluators believed that the business plan provided enough financial information to a potential customer so he or she can make an informed decision about the truss plant. The third evaluator disagreed. One respondent did not believe the land and buildings to be purchased for the truss manufacturing plant's operation would be adequate. The other two respondents were neutral. The evaluators agreed the equipment purchased was adequate for the predicted volume. One

respondent commented that different equipment might be more practical than the equipment chosen in the business plan. Two evaluators felt that the return on investment would be adequate to influence a potential investor, while the third evaluator strongly disagreed that an investor would be persuaded to invest in the new truss plant at the rate of return given in the business plan. The revised business plan includes the option of purchasing used equipment which will lower the initial capital expenditures and raise the rate of return of the truss plant.

Limitations

Evaluator bias appeared to be evident when the data was tabulated. Response bias occurred when the evaluators, consciously or unconsciously, answered questions in a direction which favors them. The respondents were individuals who were close to the truss manufacturing industry, but from different perspectives. The first respondent was an individual whose companies purchase trusses from manufactures. The responses from this evaluator felt that customer service was a high priority, however, any program which might create more overhead within the truss plant was unnecessary. New programs will raise the cost of doing business for the truss plant, and consequently raise the price of a truss. The second respondent was the manager of a truss plant. This evaluator did not want a different style of management. He clearly disagreed with any attempt to allow the sales manager to lead the design department. He also felt that an inside engineer was unnecessary. This could be considered response bias because an inside engineer would potentially take responsibility from the plant manager. The third respondent was an executive from a company that

provides software, equipment, and engineering services to truss manufacturing plants. This evaluator exhibited response bias in the areas of equipment purchased, software used, and whether an on staff engineer should be employed. Some extremity bias seemed to occur. At least one reader chose the neutral option frequently.

Suggestions For Future Research

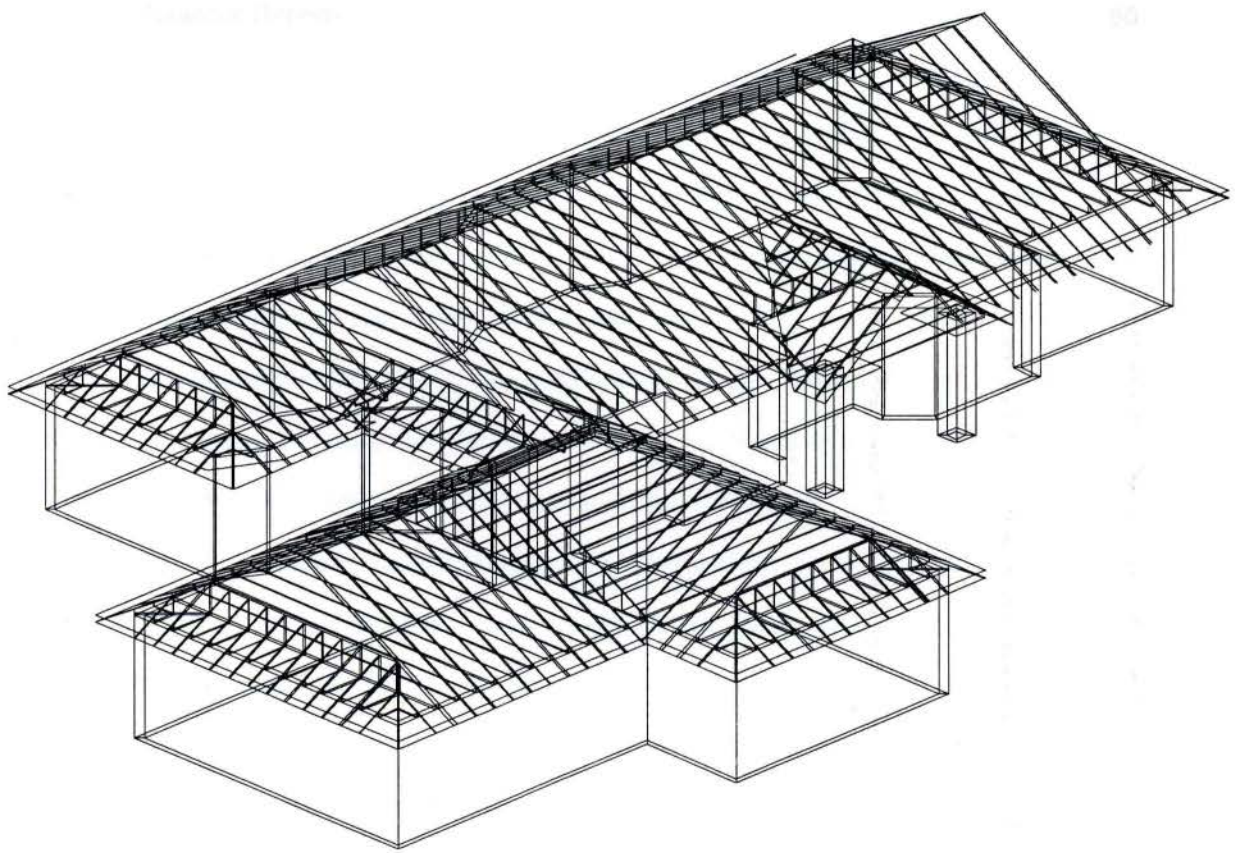
The statistical data that was used to assess the legitimacy of the business plan was subjected to bias that could have been reduced. The subject matter experts (SME's) which were chosen to evaluate the business plan were from, as previously discussed, a broad range of perspectives relating to the truss manufacturing industry. Future research might be better served to use SME's who all are truss plant owners or directly involved in the general management of a truss plant. Responses from truss plant owners and managers would not exhibit the degree of response bias that the occurred by surveying a truss plant customer and a truss plant supplier.

Appendix A

Startup and Operation of a Truss Manufacturing Plant:

A Business Plan

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History of the Company/Industry

An indicator of the state of the United States economy is the number of new housing starts which occur in a given year. When the economy is slow, often the government will attempt to revive it by initiating programs which result in new construction. The demand for building supplies for new homes and small commercial buildings will fluctuate, but new construction will still occur even in an economy that is weak. A truss manufacturing plant, which will supply truss components and other engineered products for new homes and small commercial buildings, will always have a market demanding its products.

During the past decade, the rate of new housing starts in the United States has continued to grow at an impressive rate. In the same decade, the rate of housing starts in the midwest has matched or exceeded the rate of new housing starts for the whole United States. This growth in new home construction in the midwest, along with the increase in the use of trusses and other engineered wood products in each new home results in an unprecedented opportunity to open a profitable truss manufacturing plant.

Trusses are structural members which are designed to span a given distance in a building and support a given loading which is applied to the building. Trusses can be used in a building to support floor load or roof load. Using trusses to support roof load is the most common type of roof structure. Floor trusses are not as prominent, but are gaining acceptance as the price of dimensional lumber continues to increase and the design value (strength) continues to decrease.

<i>Business Summary</i>

The new truss manufacturing plant will be located just outside the St. Louis metropolitan area. The majority of new construction for St. Louis, as with any large city, is on the outer edge of the metropolitan area, so the truss plant will still be within a reasonable distance from its product's final destination. The high cost of land within the St. Louis metropolitan area creates an advantage for locating the plant outside the city.

The truss plant will retail its products to contractors and offer discounted prices to lumberyards. The truss plant will make every attempt to ensure its products are sold to individuals with experience in construction. Trusses are engineered components, and if damaged or erected incorrectly they can lose strength. In order to ensure that the truss plant does not encounter any liability due to failures, trusses will be sold directly to experienced contractors. Trusses will also be sold to lumberyards and they can then re-sell the product at their discretion.

Truss designers and salespeople will be trained to provide technical support to customers when it is required. At least one member of management will be a professional engineer who is qualified to provide customers with a method for specific field repairs and field modifications, or other difficult technical problems.

Production and Personnel Plan

Money from investors will be required for initial expenditures such as land, buildings, equipment, and raw materials. Capital will also be required to meet production costs for the first two months, and operational costs for the first three months of the truss plants operation. The truss industry averages 38.1 days between delivery and receipt of payment, so after two months, the production end of the truss plant should be self-sufficient. General operations of the truss manufacturing will need investment capital for the first three months of operation before it will become self-sufficient.

The total cost for the startup of an operational truss manufacturing plant is \$618,650. The cost of operation for the truss plant will be \$232,786 for the months before it can become self-sufficient. The cost of equipment assumes a truss plant which will be capable of producing over \$5 million in trusses annually. Startup costs include a large component saw for high volume cutting and a small component saw for cutting low volume pieces. Connector plates will be pressed into the truss with a hydraulic clincher, and then to finish the truss a roller-gantry unit is to be purchased. All equipment will be computer controlled, and all salespeople will have laptop computers. Land and buildings will be required to produce and store the finished product. Startup costs assume the purchase of five acres of land and the construction of two large warehouse type buildings. One smaller building will also be built to serve as the office area. Raw material will consist of lumber and metal connector plates. The average truss plant turns its inventory over 6.8 times annually. Assuming year one sales of \$2.4 million, the truss plant will require startup inventory for approximately seven weeks worth of operations, or \$175,000. Initial required investment for the new truss manufacturing plant will be \$793,650.

Marketing and Sales

The customer base which the truss manufacturing plant will acquire will be those with experience in the building industry. Annual sales of goods from the truss plant will be entirely to building contractors and lumberyards.

The potential customer base will be contacted by personal visits from salespeople. The salespeople will be equipped with a price book so the customer will be able to price jobs without having to wait for the salesperson to determine a price and call the customer. The sales force will be trained in doing takeoffs from blueprint drawings. When the sales force becomes familiar enough with available truss software, they will be capable of doing designing and estimating an entire roof system. This will result in the salesperson getting an accurate price from a laptop computer while he or she is at the customer's office. Advancements in truss design software packages has made it simple for one person to takeoff and design an entire roof system quickly. With the advent of the powerful laptop, an experienced salesperson can quickly learn to do an entire job and immediately produce an accurate quote. The job can then be sent to the salespersons office for review and a seal, then forwarded to the production department to be built. All these steps can be performed in the same day to provide the best possible service for the customer.

Marketing strategy will consist of advertising a competitive price of components, with guaranteed delivery dates and guaranteed design and engineering support. In the building industry, timing is more crucial than price. A competitor may offer its product for 5-10% less cost, but if the product cannot be delivered on time it will end up costing the contractor much more money. If a truss is incorrect or damaged, building inspectors will require that a professional engineer provides a repair before workers can continue on a building. Few truss fabricators have professional engineers on staff and therefore must rely on

outside consultants or plate suppliers for modifications or repairs. The new truss plant with a professional engineer on staff will be able to provide almost immediate modification or repair drawing so that the occurrence of job shut downs will be rare, if ever. This peace of mind will be a tremendous selling point to a contractor who has been force to shut down a job and wait for a drawing from an outside company's engineer.

Competition

The St. Louis area has approximately nine truss plants, which service an area with approximately 9,500 residential starts annually. These existing truss plants will provide competition for a new truss manufacturing company entering the market. An advantage for a new truss fabricator entering a market with existing truss plants is that builders in that market are already familiar with the product and use it regularly. A market with no truss plants might indicate builders in that market have not found an advantage to using the product. It is interesting to note that not many markets exist that do not use some sort of trussed structures. This is a testament to the time and cost savings which are provided by using truss construction.

No truss plant in the St. Louis area currently has a registered professional engineer on their payroll. At least seven of the nine truss plants rely on their connector plate supplier for sealed drawings and sealed repairs. These truss plants often have to wait on the plate supplier to provide the sealed drawings, and therefore, their customers are also waiting.

The two largest truss suppliers depend on their low price for sales. Often, they can beat competitors prices on jobs by 15-20%. At least one of these suppliers are known for poor workmanship and require repairs on a relatively high percentage of their jobs. They keep their overhead low by hiring personnel with little or no experience, and count on their plate supplier for technical support, which is often slow because of the number of people an answer must go through before it gets back to the individual using the truss. The second of the two large truss plants also counts on its plate supplier for much of its technical support. This truss plant is owned by the same individuals who owns a large lumber company on the east side of the St. Louis metropolitan area. A high percentage of its sales is due to the association with this lumber company.

The remaining seven truss plants have annual sales at or below the national average for truss manufacturing plants. These truss plants all solely rely on their plate supplier for all engineered drawings of designs and repairs, which often results in job delays. Of these seven companies, four are located over 100 miles from St. Louis and have a high percentage of their sales come from areas other than the St. Louis metropolitan area. Prices of these companies are not competitive with the prices of the two biggest truss suppliers, but they do stress quality and on-time service. Trusses from these more expensive fabricators are often over designed, which does not mean that their product is higher quality, although some truss plants will often infer that this is the case. Over designed trusses mean more expensive trusses which do not perform any differently than trusses which are intended to just carry the design load.

Management

The qualifications of the individuals filling the required roles in a truss manufacturing plant, or any organization, are crucial to the success of the organization. The president/general manager is an individual with a Masters in Business Administration, as well as a Bachelor's degree in Civil Engineering. This individual also possesses a seal as a Professional Engineer for the state of Missouri. The position of general manager requires that this individual is able to competently oversee all aspects of the truss manufacturing business, from design and production to managing the companies finances. The president/general manager, because of the Professional Engineers seal, will also be required to seal all truss designs and repair drawings that the customer requests. Design software makes it possible for truss designers to perform all the design work, and the general manager will only be required to review the designs and repairs and approve them, or send them back to the designer for modifications. Approving drawings should take only a fraction of the general managers time, allowing time for other responsibilities.

The sales manager will be responsible for overseeing the sales department and the design department. An advantage that this truss company will try to establish is that by having the designers directly under the supervision of the sales manager, customer service will be a high priority for the designers. Rather than salespeople working separately from designers, they will all be in the same department and will therefore work together for the same goals. The sales manager will set sales goals, and then be responsible for providing the means to meet these goals.

The manager of finance will be the individual who is furthest removed from the product the truss plant will create. The finance manager will be an individual who can effectively bring about the financial health of the organization.

Cash flow, payables, and receivables are the items which are the most critical to a new organization, and the finance manager should be able to effectively oversee these areas. The manager of finance will be responsible for ensuring that the truss plant is setting goals which will result in a financially stable organization. The financial manager will be the individual who will determine if a goal is too low to net a profit, or the means of reaching a goal is too much of a liability for the company. The financial manager will then work with other members of management to modify goals to result in a profitable manufacturing plant.

The production manager will supervise the manufacturing of the trusses. The production manager will need to be an individual who is able to motivate manual laborers to work efficiently. The laborers will tend to be unskilled workers who will be required to follow drawings. The production manager will be responsible for the training of these workers and the accuracy of the product they put out.

<i>Financial Reports</i>

The tables on the following three pages provide a breakdown of the expenditures and the earnings for the first three years of a new truss manufacturing plant. Year one is broken down to per month, and years two and three are given as annual totals for sales and expenses.

The first three months of operation will net a pre-tax loss of \$67,661 on gross sales of \$264,000. Month four will show modest pre-tax earnings of \$2,311. Beginning in month five, the truss plant will be established and a customer base will be in place. Month five will show pre-tax earnings of over \$12,000.

As with any manufacturing business, the products of a truss plant are more in demand in certain times of the year than others. The relatively brief span of harsh winter weather in St. Louis allows for residential and commercial building to proceed strongly for nine months out of the year, and then it slows during the winter months when the weather is often unpredictable. During these winter months of the first year of the truss plant, sales growth will not be as brisk, increasing at a slower rate than in the peak building months.

Investors which provide \$608,443 for the startup costs for the operation of the truss manufacturing plant will see a total five year return of over \$1.4 million, or return on their initial investment of 130%. If financial forces make a successful truss manufacturing plant impossible, and the truss plant fails, investors will have the alternative of liquidating buildings, equipment, and inventory. The market for component saws and roller gantry units is always strong due to the growth of the truss industry in the United States over the past decade. In a worst case scenario, investors will be able to recover their initial investment.

Operating Statement - Year 1

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
<i>Gross Sales</i>												
Lumberyards	14,400	64,800	79,200	115,200	144,000	144,000	144,000	144,000	144,000	148,752	148,752	148,752
Contractors	9,600	43,200	52,800	76,800	96,000	96,000	96,000	96,000	96,000	99,168	99,168	99,168
Total	24,000	108,000	132,000	192,000	240,000	240,000	240,000	240,000	240,000	247,920	247,920	247,920
<i>Deductions From Sales</i>												
Claims	132	594	726	1,056	1,320	1,320	1,320	1,320	1,320	1,364	1,364	1,364
Discounts	79	356	436	634	792	792	792	792	792	818	818	818
Cash Discounts	53	238	290	422	528	528	528	528	528	545	545	545
Total Discounts	264	1,188	1,452	2,112	2,640	2,640	2,640	2,640	2,640	2,727	2,727	2,727
Net Sales	23,736	106,812	130,548	189,888	237,360	237,360	237,360	237,360	237,360	245,193	245,193	245,193
<i>Cost of Goods Sold</i>												
Lumber	9,020	40,589	49,608	72,157	90,197	90,197	90,197	90,197	90,197	93,173	93,173	93,173
Plates	1,543	6,943	8,486	12,343	15,428	15,428	15,428	15,428	15,428	15,938	15,938	15,938
Staples, Nails, Hardware	237	1,068	1,305	1,899	2,374	2,374	2,374	2,374	2,374	2,452	2,452	2,452
Other Materials	142	641	783	1,139	1,424	1,424	1,424	1,424	1,424	1,471	1,471	1,471
I-joists	498	2,243	2,742	3,988	4,985	4,985	4,985	4,985	4,985	5,149	5,149	5,149
LVL	261	1,175	1,436	2,089	2,611	2,611	2,611	2,611	2,611	2,697	2,697	2,697
Glulam	190	854	1,044	1,519	1,899	1,899	1,899	1,899	1,899	1,962	1,962	1,962
Total Direct Materials	11,892	53,513	65,405	95,134	118,917	118,917	118,917	118,917	118,917	122,842	122,842	122,842
<i>Production Costs</i>												
Direct Labor Costs	13,138	13,138	16,057	23,356	29,195	29,195	29,195	29,195	29,195	30,159	30,159	30,159
Manufacturing Overhead	2,231	10,040	12,272	17,849	22,312	22,312	22,312	22,312	22,312	23,048	23,048	23,048
Total Production Costs	15,369	23,178	28,329	41,206	51,507	51,507	51,507	51,507	51,507	53,207	53,207	53,207
<i>Expenses</i>												
Delivery Expense	626	2,817	3,444	5,009	6,261	6,261	6,261	6,261	6,261	6,468	6,468	6,468
Selling Expense	12,579	15,071	15,783	17,563	18,987	18,987	18,987	18,987	18,987	19,222	19,222	19,222
Administrative Expenses	18,544	18,544	18,544	18,544	18,544	18,544	18,544	18,544	18,544	18,544	18,544	18,544
Bad Debt Expenses	71	320	392	570	712	712	712	712	712	736	736	736
Engineering Expenses	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113	5,113
Depreciation Expenses	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780
Total Expenses	38,714	43,646	45,056	48,579	51,397	51,397	51,397	51,397	51,397	51,862	51,862	51,862
Net Operating Profit (Loss)	(42,238)	(13,525)	(8,241)	4,970	15,538	15,538	15,538	15,538	15,538	17,282	17,282	17,282
Less: Interest Expense	237	1,068	1,305	1,899	2,374	2,374	2,374	2,374	2,374	2,452	2,452	2,452
Other Non-Operating Expense	95	427	522	760	949	949	949	949	949	981	981	981
Income (Loss) Before Taxes	(42,571)	(15,021)	(10,069)	2,311	12,215	12,215	12,215	12,215	12,215	13,849	13,849	13,849

Appendix B

Survey - Business Plan for Truss Manufacturing Plant

Please read the enclosed business plan, and answer the survey. The questions are intended to determine how thorough the business plan is, and how well it can be related to a business in the 'real world.' Be advised, after each section of questions, a place for comments is inserted. *Questions within each section may appear to be unrelated, comments should be made regarding specific questions within the section.*

- 1) The business plan thoroughly covered the history of the industry and company.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 2) Employee moral will not be a major problem in this truss plant because the employees are sufficiently compensated and the budget allows for good employee benefits.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 3) The business plan provided enough information about the industry to retain the interest of a potential investor.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 4) Management is informed and empowered to make decisions for the best interest of the company.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

5) Members of management have well-defined responsibilities.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

If one or more question in this section was rated unusually high or unusually low, why?

Comments?

6) The marketing plan to be used to get the truss plant its initial business would work in today's construction industry.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

7) The market which the truss plant is going to target its sales towards is one that will provide a strong foundation for future business.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

8) The programs which are designed to make this truss plant more appealing to customers will work in today's construction industry.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

9) The strong focus on customer service is necessary in today's competitive marketplace.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

If one or more question in this section was rated unusually high or unusually low, why?

Comments?

- 10) Cash flow budgeted for the truss company will be one that will ensure a stable business.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 11) Equipping the truss plant with the latest equipment for automated truss manufacturing is critical to the success of the truss plant.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 12) Ensuring that the truss plant has the latest technology for truss design is critical.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 13) The organizational structure for the truss plant will allow for good communication between levels, while still maintaining a hierarchy for important decisions.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 14) There are areas in the organizational structure which will probably cause adversity within the company.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

- 15) The goals set for the company are unreasonably high.
- | | | | | |
|-------------------|-------------------|---------|----------------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
- 16) The goals set for the company are attainable, but not within the time period stated.
- | | | | | |
|-------------------|-------------------|---------|----------------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
- 17) The information provided in the business plan about the industry is accurate.
- | | | | | |
|-------------------|-------------------|---------|----------------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |

If one or more question in this section was rated unusually high or unusually low, why?

Comments?

- 18) The business plan provides a potential investor sufficient information about the end use of a truss.
- | | | | | |
|-------------------|-------------------|---------|----------------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |
- 19) Liability will be reduced by selling trusses only to lumberyards and building contractors, as described in the business plan.
- | | | | | |
|-------------------|-------------------|---------|----------------|----------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Disagree | Somewhat Disagree | Neutral | Somewhat Agree | Strongly Agree |

20) The truss plant will be limiting its potential sales by restricting who can purchase the trusses.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

21) A Professional Engineer on staff will be a competitive advantage for the truss plant.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

22) The land and buildings will provide sufficient area for a truss plant at its predicted annual sales.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

23) The equipment used at the truss plant will be adequate for its predicted annual sales.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

If one or more question in this section was rated unusually high or unusually low, why?

Comments?

24) The truss plant will have sufficient capital for its first three months of operation.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

25)

Assuming all given information about the competition is true, the truss plant will have a competitive advantage over existing companies.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

26)

The return on investment will be adequate to influence a potential investor.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

27)

The financial data is reasonable for an operating truss plant.

1	2	3	4	5
Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree

If one or more question in this section was rated unusually high or unusually low, why?

Comments?

**Please return the survey in the postage paid envelope enclosed.
Thank you very much for your time.**

Appendix C

Cover Letter

Timothy M. Liescheidt
4203 Shoreline Drive
Earth City, MO 63045

Richard Marriot
MiTek Industries, Inc.
14515 Noth Outer Forty Road
Chesterfield, MO 63017

Dear Sir/Madam,

As a design engineer for a large supplier of truss plates, I have become well acquainted with the engineering properties of metal plate connected wood trusses. Previous experience in the lumber industry has given me the opportunity to become familiar with many aspects of residential and small commercial construction. To learn more about the business end of truss manufacturing, I recently completed the course work required for a Masters in Business Administration, with my culminating project being a business plan for the startup and operation of a truss manufacturing plant.

One can learn a great deal about general business by taking classes, however, to acquire more specific knowledge, the best teacher is experience. The people with the most experience in a given field tend to be working in that field, and not teaching about it. To become more familiar with truss manufacturing, I am requesting that subject matter experts in this field, such as yourself, critique my business plan.

Enclosed is the business plan prepared as a final project for a Masters of Business Administration degree, and an accompanying survey requesting input about the plan. The results will be analyzed and then improvements to the plan will be made. The names of the respondents will be held in the strictest confidence and all information gathered will be used solely for the purpose of research.

The business plan and survey should require about 40 minutes of your time. For the most accurate results, it is best to answer the survey immediately after reading the plan.

I would be most happy to answer any questions that you might have. Please do not hesitate to write or call. I can be reached at the address above or by calling (314) 434-1281, ext. 3324.

Thank you for your assistance.

Sincerely,

Timothy M. Liescheidt

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