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An Analysis on Starting Up a Specific Small Business

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An Analysis on Starting Up a Specific Small Business

by

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Dedication

I dedicate this report to my friend with the alias name of George Marcus Vittattoe. Vision without action or planning is just a daydream. With lots of hard work, strategy, and a little luck we can turn your vision into reality.

Acknowledgements

To Dr. Kyle Lewis and Dr. Robert Duvic, I thank you for all your support. I also would like to thank Jim Siemers, Mike Ilgen, Melinda Luxemburg, Troy Nelson, and Molly Firkins for their support throughout this program.

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Abstract

An Analysis on Starting Up a Specific Small Business

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A unique business opportunity has been presented to me. I have been invited to create a small business that would initially offer mechanical design services to two main customer segments: automotive and biomedical device companies. My main responsibility is to help frame the small business and act as an investor partner. I will act as a silent partner once the day to day operations begin. My main focus of this paper is to provide practical information to answer many specific questions about starting this small business. A Net Present Value (NPV) and Profitability Index (PI) analysis will help me determine whether the required initial investment capital will be a good investment for all the parties involved. The legal aspect of managing people in a small business with less than 15 employees will be also reviewed. The conclusions from the Human Capital Framework and the main components of a business plan will be used in the future development of an operating procedure. A business structure will be selected as part of

this analysis. Finally, the business values and strategic goals that are most important to all participating parties will be mentioned.

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INTRODUCTION

A unique business opportunity has been presented to me. I have been invited to create a small business that would initially offer mechanical design services to two main customer segments: automotive and biomedical device companies. The Small Business Administration (2010) defines a small business as an independent business with fewer than five hundred employees. This is a small business venture and not a startup company, because the customers for this new company are already established. My main responsibilities are to help frame the small business and to act as an investor partner. I will initially act as a silent partner once the day-to-day operations begin for the first year. My main focus of the paper will be divided into four main areas. Background information that highlights some of George's past and present work dissatisfaction will be discussed; these disappointments are influencing him to pursue the entrepreneurial career route. The background information will be used in the framing of this business venture to avoid past mistakes and lead to a better work environment. The legal aspect of managing people in a small business with less than 15 employees will also be reviewed. Another area of my concern is to calculate whether this business venture is economically feasible; this analysis will help me decide whether I should accept the opportunity. The Human Capital Framework and the critical components of a business plan will guide both my partner and me to develop strategic goals and indentify some capabilities. The conclusions from this report will be utilized for the future development of an operating procedure for this particular small business; an operating procedure is the framework for the daily operation of a small business.

BACKGROUND

"Those who cannot remember the past are condemned to repeat it" is a quote from George Santayana. I also believe in studying the past to hopefully identify the mistakes that others have done and to avoid them myself. Therefore, this chapter will be dedicated to my business colleague's past work experiences; this information is being collected during frequent interviews with my colleague. My colleague's main priority is to create a small business that operates in a way that reflects his values and ideals. By understanding my colleague's past, I am hoping to better understand and identify his values, ideals, and motivations; this tacit knowledge will then be used later in developing the company's values, which will be documented in the small business' operating procedure. The entire firms' names and my friend's name have been altered to keep them incognito.

My friend, George, worked in a small design firm, E-Waste, with about 45 people. At E-Waste, George mastered a lot of the basic mechanical and electrical design principles by working on E-Waste's government projects. George quickly became an efficient and highly valuable member of E-Waste. George desired to work on commercial projects such as Automotive and Biomedical Device industries. E-Waste allowed George to work on those projects, especially if he created the new customers. George soon learned the intricacies of sales and the quotation process. Going forward a couple of years, George had a customer base from the automotive industry and the revenue generated by George made up a significant portion of E-Waste's total income. George was proud of his work and happy to be doing design work for projects that he liked. Unfortunately, his satisfaction with his job stopped when paycheck and project problems appeared. The company could no longer pay the suppliers for ongoing projects, which

caused delays and angered customers. The E-Waste employees had their paychecks delayed for a couple of weeks every other pay period. The employees were always worried about not receiving the next paycheck and about paying their bills on time. Some employees did not have large savings accounts to rely on. E-Waste management told their employees to be patient while E-Waste got their accounting problems in order and they were told not to worry about the business. E-Waste management still gave wage increases to their employees, so the employees were frustrated but loyal. One chilly day, E-Waste employees found their office building doors shut for good. Many employees, including George, were owed back pay. E-Waste owners abruptly disappeared in order to avoid any pending court action brought against them. George was forced to look for other employment.

George's reputation of being a smart, intelligent designer opened the door for employment with another smaller business (around fifteen people), named SmartyDesigns. SmartyDesigns heard about George through a common customer. George had a couple for offers of employment at the same time. The larger firm offered George a higher salary than SmartyDesigns; however, he would have to design for an industry which he had no interest in. SmartyDesigns did work with automotive customers, George's favorite type of customers, but they offered him a much lower salary. George was torn with making a decision and asked for my assistance as a friend. At that point, I offered another solution: negotiate with SmartyDesigns to get a percentage of all the new project work that he can bring in using his customer base, in addition to the base salary they offered him. This created a win-win situation. George agreed and successfully implemented the negotiation strategy. George had the potential to earn a larger income and enjoyed his project work. SmartyDesigns grew its revenue from

the new sales of George's customers. George was content with his employment for the time being.

Early in 2010, George became worried about his earnings at SmartyDesigns. Even though George had brought a significant amount of revenue to the company, the company had not been paying his earned income in a timely fashion. George believed the company was fiscally sound, but he thought the company's frugal corporate culture was costing him money. He found out that other employees have received a salary increase. As a result, George felt that SmartyDesigns did not value his contributions to the company nor respect him. The employees' computers and equipment were outdated and almost obsolete; the equipment was hampering the workers' productivity. In George's opinion, more of the company's revenue needed to be reinvested in the company. George also had concerns with the lack of productivity from the technicians. SmartyDesigns' hours of operation were from 8:00 A.M. to 5:00 P.M.; George noticed that the majority of the technicians usually ran late in the morning. The technicians procrastinated and did not work on projects until they absolutely have to. When the project work piled up, the technicians rushed through the project work, which often lead to quality issues. The technicians' pay was not directly related to any project work. Their wages were on an hourly basis. The technicians' direct supervisor is the owner of the company. The owner did not work on projects. Finally, George was getting nervous about the true intentions of SmartyDesigns' owner. Was the owner getting tired of running his own business? Was someone else going to purchase the company? Could SmartyDesigns have financial problems like his previous employer?

The Expectancy (VIE) Theory of Motivation would explain the technicians' lack of motivation. The technicians do not see a direct correlation between their effort and a better outcome for the projects. Since they get paid on an hourly basis, there are quality

issues on a project that has to be redone. Therefore, the technicians get to charge more hours. Rework needed to correct quality issues from projects is financially rewarding to the technicians.

SmartyDesigns' delayed payment techniques and obsolete equipment discouraged George from being more productive. He wanted the unfair treatment toward him to be corrected. The Equity theory perfectly explains this scenario; he is motivated to restore equity. George's solution to restoring equity is to transfer his customers to a small business that he will partly own and manage. Since I have been his "life coach" in crucial moments of his life, George asked me to help him establish this small business to eliminate or minimize negative work experiences that he encountered in the past. Specifically, George requested my assistance in developing an operating procedure that will reflect his values and describe mechanisms to avoid similar negative work environments.

LEGAL ANALYSIS

A company should know the legal aspects involved in having employees and in having business agreements. This chapter will briefly address these areas specifically relating to the small business.

According to the U.S. Equal Employment Opportunity Commission (2010), most employers with at least 15 employees are covered by the EEOC laws. In the next two years, there is no plan to have that many employees. However, the small business will follow the EEOC guidelines so that when the business does exceed that number of employees, it will already be in compliance.

How does worker's compensation relate to a small business? According to the Texas Department of Insurance (2010), workers' compensation is a "state-regulated insurance system that pays the medical bills and some lost wages of employees injured on the job." Small businesses have the option to participate under the state's workers' compensation system. If the small business does not opt to participate, the state labels these businesses as nonsubscribers. According to TDI, nonsubscribers lose several key legal defenses and can face high damage awards if an injured employee can prove in court that the employer was negligent. To mitigate the liability risk of a work-related injury, my small business will participate in the state's workers' compensation system; the small business will buy workers' compensation insurance under the Texas Workers' Compensation Act from an insurance company licensed to sell it. If a work-related injury does occur, an employee may not sue the employer but may receive medical and income benefits set by the Texas Worker's Compensation Act.

There is always the possibility that an employee of the small business could independently design something that resembles a patented design or machine. If the party

who owns the patent asks for compensation or sues the company, knowing a little about patent law could avoid prosecution. According to the United States Code Title 35 Sec. 271 (c), "Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination, or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer." The key word from the USC Title 35 Sec. 271 (c) is "knowing"; the probability that the company will be liable for the infringement of a patent in a court of law diminishes if the employees do not know about the patents in the first place. Therefore, the small business operating procedure and an employee handbook should explicitly prohibit employees from searching and reading patents which mitigate the patent infringement risk.

Employees or independent contractors working for the small business may be exposed to valuable customer contact list, machine designs, programming codes, trade secrets and confidential information. According to Fishman (2008), a nondisclosure provision should be included in agreements with independent contractors. (p. 166) A similar provision should be included in an employee handbook or employment agreement; employees must sign the handbook confirming that they will follow handbook policies. The nondisclosure agreement will also be stated in the operating procedure.

Another area of concern is the legal risk involving the business agreements of the small companies. A business agreement is an agreement between two or more entities which creates an obligation to do or not do a particular thing (Black's Law Dictionary,

1979). For the small business, many agreements between customers and independent contractors will be performed. A well-designed written agreement will clarify what each party has agreed to. Costly misunderstandings can occur by parties without the guidance of a clear written description of what he or she is suppose to do and what will happen if those actions are not done. There are many advantages to written agreements. The mere process of deciding what to include in a written agreement should force a party to think very carefully what the terms of the agreement should be. If the payment terms are clearly written, this will decrease the number of disputes about how much a customer agreed to pay the small business. It is important to get the written agreement right the first time. It should reflect your actual intention in terms that are clear and unambiguous. Having a written agreement does not guarantee that the other party will perform as promised, but it does make it easier to resolve contract disputes or get a court or arbitrator to enforce the agreement.

If a party is not living up to his or her contract obligations, the first step is to have all involved parties read the agreement again. There should be a section called contract specifications. These specifications or "Services to Be Performed" define what the parties are obligated to perform. The involved parties, mediator, judge, arbitrator, or jury will use the specifications and compare them to the actual work performed to determine who is right. How much time is left to complete the work? The deadline is usually mentioned in the "Term of Agreement" clause. Either party might still have time to complete or correct the work according to the contract. A well thought out written agreement should contain the exact methods of how disputes should be resolved; if it is your agreement, the dispute methods agreement clause should favor your business.

The dispute methods available are negotiation, mediation, arbitration, and litigation. The least expensive method should almost always be negotiation; informal

discussions with the other party should start with sensible arguments and evidence to back up your position. A copy of the contract should be present at these meetings, and you should be ready to explain in a calm and businesslike way why you think the other party did not meet their contractual responsibilities. According to Fishman (2008), a mediator, a neutral third person, meets with the people involved in the dispute and suggests ways to resolve their controversy. (p. 42) A mediator can sometimes help the parties come to an agreement if the dispute problems deal with personality conflicts or a lack of good communication. Either party does not have to accept the outcome in mediation; they can ask for arbitration. Arbitration will impose a solution like a judge in a courtroom. The arbitrator will hear both parties at an informal hearing and will issue a decision, or award, at the end. Arbitration can either be binding or nonbinding. Finally, the most expensive option left is to sue in court.

When choosing litigation, consider the negative financial impact on your business as well as the negative impact on your reputation. Minor problems should be settled using the other dispute options; if the damages are substantial, a lawsuit will be worthwhile only if you get a favorable judgment. If you sue for breach of contract of services, the following damages are excluded by law: specific performance, punitive damages, and damages for pain and suffering.

Proving a breach of contract should be easy when you have a clearly written agreement. Five things are usually required. Present the written and signed contract (signed by both parties) to the court. Prove to the court that you met your contractual responsibilities up to the time of the other party's breach. There has to be clear evidence that the defendant failed to meet their contractual obligations. You have to prove to the court that you took the reasonable steps to minimize or mitigate the economic impact of the other party's failure to live up to the contract; you cannot recover damages in court if

you did not take action. Finally, you must clearly show that you suffered an economic loss as a result of the other party's breach of contract. Even if you sue and win, the court cannot help you collect the money from a defendant if they refuse to pay. There is risk involving going to court even if you think you have a great case.

The Texas Deceptive Trade Practices Act (1973) provides that it is unlawful to engage in false, misleading, or deceptive acts or practices in the conduct of trade or commerce. Whenever the Consumer Protection Division of the Attorney's General's office thinks a business' actions have violated the DTPA, it can get a court order to impose a penalty for each violation. If a consumer sues the small business and a jury or court determines the fraudulent actions were done intentionally, the consumer may get triple damages, including recoverable compensatory, punitive, and others.

Can the small business have some protection against liability claims made by a customer or other vendors? Professional Liability Insurance also known as Errors and Omissions Insurance will help mitigate this type of risk for businesses. The Texas Department of Insurance has a list of licensed insurance companies that are statutorily authorized to write Professional Liability Insurance. An insurance company has advertised that they can provide Commercial Liability Insurance and Workers' Compensation insurance for around $500 per year. This estimate will be used in the financial analysis section as one of recurring operating costs. How you manage the legal aspects of business determines their financial impact to the business.

FINANCIAL ANALYSIS

One of my main roles for this small business is to act as an investor partner, so I am very interested in whether the small business would be a good investment. Therefore, this chapter will be dedicated to the financial analysis of the small business; the financial analysis would normally be part of a business plan. According to Hal Root and Steve Koenig (2005), the business plan is a blue print to your first few years of operation and forecasts future growth; the business plan includes a cover sheet, introduction, mission statement, overview of the business, economic analysis, financial analysis, market analysis, summary, and appendix. At this point, I will be using only the major sections of a business plan that are valuable to establishing the small business.

Since I am the investor, I will use the financial analysis section of the business plan to have a more accurate picture of whether the small business is viable. According to the U.S. Dept of Commerce (2000), seven out of ten employer firms last as long as two years and about half survive five years. I am hoping this analysis will prevent this small business from failing as well. The financial analysis in this chapter will focus on calculating whether the small business will be a good investment at the end of its first five years of operation. The analysis should help me create some financial measures or goals for the business to stay profitable. All the capital requirements and startup costs will be included in the analysis; the first year budget will also be included.

Since I am not the knowledge worker of this small business, how were the capital requirements defined? By asking George hundreds of questions, I gathered information for the requirements relating to machinery, tools, software programs, lab space, office space, furniture, shipping, and etc. The process of gathering information from George

was definitely more arduous than I had previously thought. My persistence for acquiring the information often strained the relationship. The other miscellaneous items like cleaning supplies and photo copy paper were thought of between the two of us. Then, the commercial costs for the individual items were usually found through online retailers.

A first year budget will be calculated based on all the capital requirements, start up costs, and the recurring costs for a year. Start-up companies do not have a known customer base or sales revenue; this small business venture is not a start up. George knows the annual sales figures which are based on large or small projects. Customers issue purchase orders for large projects for around $85,000 and small projects for around $35,000. In a given year, the ratio of small and large projects keeps fluctuating and the exact ratio is unknown. One assumption in the sales revenue calculation is that in a given year the ratio of large and small projects sold are even. The U.S. small business tax laws are on the verge of changing; I will therefore use a high tax rate of 40%. Since I want to see the financial numbers on very pessimistic conditions, I will not take into account depreciation; the sales revenue will remain constant over the span of five years. The sales revenue will be calculated over a span of five years. To calculate the present value of the sales revenues for all five years, the sales revenue will be treated as an annuity; the formula and calculations can be seen on Table 1.

A	B	C	D	E	F	G
Worst case assumptions: Interest rate 2011 - forecast 3.25% (forecast-chart)						
consider sales revenue as an annuity (assuming no revenue growth in company and only one designer) PVA = C (1/r - 1/(r * (1+r)^T))						
Assume 40% taxes with uncertain tax policies.						
The recurring costs will increase each year by 3%. Costs will calculate this as a growing annuity. PVA2 = C [1/(r-g) - 1/(r-g) * ((1+g)/(1+r))^T]						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
recurring cost	$31,615.98	$131,615.98	$131,615.98	$131,615.98	$131,615.98	$131,615.98
one time start-up cost	$67,078.80					
sales revenue after taxes		$101,035.20	$101,035.20	$101,035.20	$101,035.20	$101,035.20
Number of years	5					
Interest rate	0.0325					
PVA of recurring cost for Year 0	$598,484.07					
growth rate	0.03		According to Corporate Finance by Ross,			
PVA2 of recurring cost for Year 0	$634,286.47		Westerfield, Jaffe, and Jordan			
			PI = PV of future expected cash flows after initial			
Number of years	5		investment / PV of initial investment			
Interest rate	0.0325					
PVA of sales revenue for Year 0	$459,427.17					
sales growth rate	0.06					
PVA2 of sales revenue for Year 0	$516,041.10					
			PI	**-2.77**		
NPV calculation for 14 machines	-$273,554.08		**PI (sales price increase)**	**-2.20**		
NPV calculation max (with 6% price increase)	-$216,940.15					
NPV for one owner	-$136,777.04	NPV = PVinflows - PVoutflows				
NPV for one owner with price increase	-$108,470.08					
My initial investment	$49,347					
Alternate investment opportunities	$57,904.79	FV = Co (1+ r)^T				

Table 1: NPV Calculation Spreadsheet

I am assuming that George will be the only designer for five years; there is no growth in this bleak scenario. The maximum project capacity that George can complete in a year is 14 projects. Twenty percent of the sales revenue will be considered profit; this is the best assumption without any other available information.

The start-up costs will include all the hardware, software, and initial fees; this will also include the deposit required for renting a 1000 square foot office/lab building and the purchase of a forklift which is required for the small business unless a building is found with a loading dock. The start-up calculations are listed in Table 2. The start-up costs are around $67,078.

B10 | =SUM(B2:B9)

	A	B
1		
2	Hardware	$52,539.22
3	Software	$10,789.58
4	Facilities	$3,000.00
5	LLC certificate cost	$300.00
6	Lawyer/Accountant fee for LLC ($150/hr) three hours	$450.00
7		
8		
9		
10		$67,078.80
11		

Table 2: Start-up Cost Calculation

The recurring costs involve renter's insurance, Professional Liability Insurance, office building rent, electric and gas utilities, cell phone monthly charges, internet monthly fee, and miscellaneous office supplies. This cost is around $31,615; the calculations are shown on Table 3.

F16

	A	B	C
2			
3		Monthly	Yearly
4	Facilities		
5	renters building insurance	$400.00	$4,800.00
6	liability insurance to cover company (found a yearly quote)	$42.00	$500.00
7	electricity (get from CPS)	$300.00	$3,600.00
8	natural gas (get from CPS)	$100.00	$1,200.00
9	cell phones (recurring charges)	$348.00	$4,176.00
10	office building rent	$1,000.00	$12,000.00
11	office supplies (cleaning as well)	$200.00	$2,400.00
12	internet usage	$100.00	$1,200.00
13	marketing (advertisement)	$100.00	$1,200.00
14	software		$39.98
15	computer		$500.00
16	Total recurring cost (non-salary)		$31,615.98
17	Salary		
18	Knowledge Worker (COO)		$30,000.00
19	Alliance Partner (CFO)		$30,000.00
20			
21			
22			
23	Hourly		
24	Alliance Partner (Accountant)		$20,000.00
25	Technician		$20,000.00
26	Recurring Wages		$100,000.00

Table 3: Recurring Costs

An accountant and a technician will either be hired as a contractor or on an hourly wage; George will start with a starting salary of $30,000. The recurring costs or the salary costs for all other employees will be $100,000. The recurring costs will grow by 3% each year for all five years; this would in theory cover modest salary increases. To calculate the present value of the recurring costs for all five years, the recurring costs will be treated as a growing annuity. The growing annuity formula and calculation is on Table 1. The interest rate is 3.25% in all the annuity calculations. This year's average interest rate listed by Forecast-Chart.com (2010) is 3.25%; next year's prime interest rate is predicted to be the same. The recurring cost for all five years is $634,286.

The unknown variable is how many projects can be done by George within a maximum of 14 projects. To simplify the calculations, I will assume an identical number of projects will be done for all five years. A Net Present Value method will be used to determine if the small business has potential; NPV is the present value of all cash inflows and outflows. According to the Corporate Finance textbook by Ross, Westerfield, Jaffe, and Jordon (2009), if a project has a NPV value that is greater than zero, then the project should generally be accepted. (p.221) Will I calculate an NPV greater than zero within George's project completion capacity of 14? I have calculated that 14 projects are not enough for the NPV to be greater than zero. 21 projects are needed to have an NPV value greater than zero and a PI of 1.02. In a separate calculation, I treated the sales revenue as a growing annuity with a growth of 6%; this would mean a 6% annual sales price increase. In this scenario, the business would have to sell and complete 19 projects for the NPV value to be greater than zero and a PI of 1.13.

According to the Corporate Finance textbook by Ross et al. (2009), the Profitability Index (PI) is defined as the present value of the future cash flows after the initial investment divided by the initial investment; projects should be accepted if the PI is greater than one. (p.227)

Since the number of projects is not possible with one designer, I had to drastically change the business model to come up with values that are within the 14 projects capacity and within the maximum initial investment of $100,000. A building with a loading dock is now a critical requirement because the forklift purchase is eliminated from the business model. A pallet jack would have to be used to transport the machines to the semi-truck. Renting a forklift would be another alternative. The personnel have been reduced to just George; any technician/accountant work will have to be done by him or contracted out. Only one computer purchase will be allowed. An annual sales price increase will have to

be implemented. In all the scenarios, George would have to agree to no salary for the first business year. His salary in the second year would be roughly $30,000 with 3% salary increases thereafter. Finally, a 3% discount would be the maximum that can be offered to the customers. With all these conditions in place, George would have to complete and sell 12 projects every year for the business to survive the first five years and the PI of 1.03 and a positive NPV would be achieved. The first year estimated budget would be reduced to $71,629. I would consider this as the minimum initial investment. Please see Table 4.

A	B	C	D	E	F	G
Worst case assumptions: Interest rate 2011 - forecast 3.25% (forecast-chart)						
consider sales revenue as an annuity (assuming no revenue growth in company and only one designer) PVA = C (1/r - 1/(r * (1+r)^T))						
Assume 40% taxes with uncertain tax policies.						
The recurring costs will increase each year by 3%. Costs will calculate this as a growing annuity. PVA2 = C [1/(r-g) - 1/(r-g) * ((1+g)/(1+r))^T]						
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
recurring cost	$31,615.98	$61,615.98	$61,615.98	$61,615.98	$61,615.98	$61,615.98
one time start-up cost	$40,012.80					
sales revenue after taxes		$86,601.60	$86,601.60	$86,601.60	$86,601.60	$86,601.60
Number of years	5					
Interest rate	0.0325					
PVA of recurring cost for Year 0	$280,180.13					
growth rate	0.03					
PVA2 of recurring cost for Year 0	$296,941.01					
Number of years	5					
Interest rate	0.0325					
PVA of sales revenue for Year 0	$393,794.72					
sales growth rate	0.06					
PVA2 of sales revenue for Year 0	$442,320.94					
			PI	**0.35**		
NPV calculation for 14 machines	$25,224.93		**PI (sales price increase)**	**1.03**		
NPV calculation max (with 6% price increase)	$73,751.15					
NPV for one owner	$12,612.46					
NPV for one owner with price increase	$36,875.57					
My initial investment	$71,629					
Alternate investment opportunities	$84,050.03					

According to Corporate Finance by Ross, Westerfield, Jaffe, and Jordan
PI = PV of future expected cash flows after initial investment / PV of initial investment

NPV = PVinflows - PVoutflows

FV = Co (1+ r)^T

Table 4: Calculations Using Revised Business Model

How many projects are required to have a NPV value greater than the present value of my initial investment? Assuming the profit distribution would be equally shared, the NPV value would have to be divided by two, because there will be two

owners, George and myself. The number of projects that George would have to complete and sell every year would be above his stated capacity. At fourteen projects, the NPV value divided in two is $73,735, and the alternative investment with an interest of 3.25% for a CD would be $84,050.

A slight twist to the second business model is to add another designer in the first year. The project output would need to increase to 25 projects annually. The initial investment would go to $107,625, but my share of the NPV value would be $189,177 with a PI of 3.46.

The NPV and PI analysis proved to me that the small business has the potential of being a good investment. Despite my dismal constraints and assumptions, the small business would have to sell and complete at least thirteen projects annually to make my investment worthwhile. Thirteen projects is a realistic goal that can be obtained by the sole knowledge worker of George. Any year with a production of less than twelve projects would be devastating to the company; this is the break-even point. The financial analysis process allowed me to be more thorough and include more necessary but smaller items that ultimately increased the initial investment estimate.

HUMAN CAPITAL FRAMEWORK

Over the years, a plethora of strategies have been developed and employed in hopes of optimizing people's work performance and improving the other aspects of the human capital element. The Human Capital Framework (HCF) looks at human capital in an organizational context; the HCF is usually used as a method in which to evaluate how organization's policies relate to their strategies. The HCF as depicted in Figure 1 Human Capital Framework, works from an evaluation of strategic goals and organization capabilities to identify the effectiveness of the implementation levers used to create or enhance the capabilities which enable achievement of the organization's strategic goals (Lewis, 2009, p. 12). In this chapter, I will discuss how I am using the HCF analysis to further develop critical aspects of a business plan.

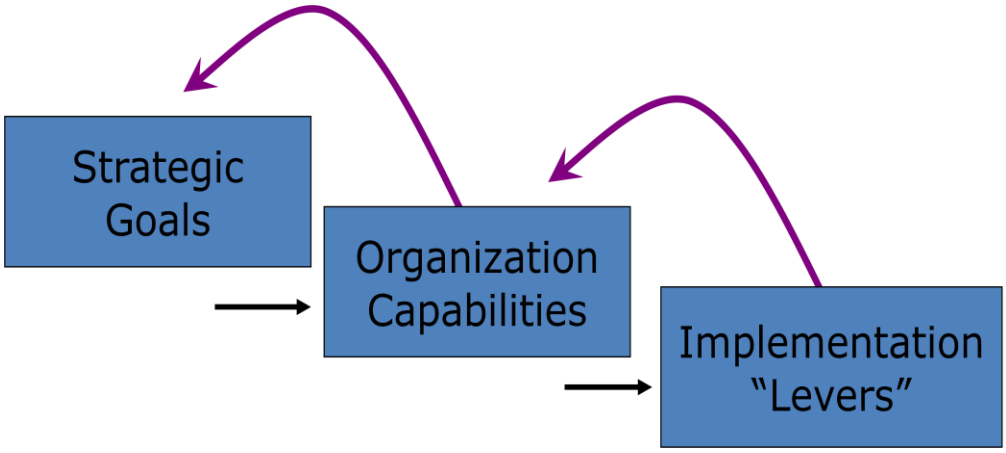

Figure 1: Human Capital Framework

The Strategic Goals will often include financial goals, market goals in terms of position and share, and any other process/product goals (Lewis, 2009, p.14). Before creating any goals, I will develop three sections from the business plan as defined by

Root and Koenig (2005); they are the economic analysis, financial analysis, and market analysis. (p. 41) In my mind, the information from these three areas will help me create the correct Strategic Goals for this small business.

The economic analysis is a report on the health of the local, state, regional, and national economy as it relates in general and specifically to your business and industry (Root and Koenig, 2005, p.43). As you recall, the small business will serve two customer segments: automotive and biomedical industry that are located in the United States, China, and Mexico. We will first look at the automotive industry in the United States.

Below is a passage that clearly explains the state of the automotive industry in the US (Durbin and Krisher, 2010, The Canadian Press):

"George Pipas, Ford's top sales analyst, said that though sales have seen monthly ups and downs this year, they continue to improve gradually.

Industry analysts expect full-year sales of around 11.6 million vehicles for 2010. Last year, they totaled 10.9 million. In 2007, before the recession struck in force, sales came in around 16 million.

Buyers remain cautious, responding to promotions and economic news, which means sales come in spurts.**"**

For George and me, this means that the customers will continue to invest in small projects for minor expansions or quality purposes; those projects will still generate some revenue for this small business.

The biomedical industry trends will be even harder to gauge after reading the following facts. The $200 billion U.S. medical-device industry voiced concern Tuesday about "potentially disruptive" proposed changes to a widely used device-approval process at the Food and Drug Administration. This system is relied upon heavily by big device companies, especially makers of orthopedic implants like Zimmer Holdings Inc. (ZMH)

and Johnson & Johnson (JNJ) (Kamp, 2010, Dow Jones Business News). Johnson & Johnson's new revelations involving the quality control problems of the popular over-the-counter medicines could put a dent in J&J's reputation for corporate responsibility (Rockoff, 2010, Wall Street Journal Europe). On positive note, Warren Buffet has partially rebuilt the stake in Johnson & Johnson after he had reduced it over the previous two years (Funk, Aug 2010, The Canadian Press). Unfortunately, Johnson & Johnson's business trend is puzzling after all the events that are occurring. George and I are still very optimistic about being able to provide solutions to Johnson & Johnson in the future.

The more disturbing news is about Ciudad Juarez, Mexico. Juarez is the sister city of El Paso, Texas. The entire drug related violence that is occurring along the US and Mexico border, especially in Ciudad Juarez, is negatively impacting business as well. Ciudad Juarez, Monterrey, and other Mexico cities are hubs for many automotive and biomedical manufacturers; unfortunately, they are all experiencing murders and violence that are threatening to destabilize the local municipal governments. About 28,000 homicides have occurred in Mexico during a drug cartel war that began in 2007 and escalated the next year (Torres, August 2010, para. 24). More than 6,000 murders have occurred in the Juárez area alone since January 2008 (Torres, August 2010, para. 24). Over the past couple of years, many foreign corporations have heavily restricted employees' business travel to Mexico. Of more than 300 foreign firms surveyed, 34% said concerns about violence have led them to temporarily reduce operations in Mexico or employee travel there (Kiernan, July 2010, para. 2). Another 18% of companies are considering curtailing operations (Kiernan, July 2010, para. 2). Less foreign investment into Mexico could be the overall long term effect of all the violence. However, Volkswagen has decided to build a $550 million dollar plant in southern Mexico as part of their expansion plan (Völkel, September 2010, para. 1).

China, on the other hand, has very optimistic news. Car sales for August rose over 55% year on year to 1.21 million vehicles, up from 1 million a month earlier, according to figures from China Automotive Technology and Research Center (GlobeNewswire, October 2010, para. 4). Johnson Controls Inc. (NYSE: JCI), the world's largest supplier of automotive batteries, today announced it is investing $118 million to build a third automotive battery plant in China, to be located in Chongqing (Fitzgerald, October 2010, para. 1).

From all these analysis, my small business will not invest in creating new business in Mexico; attention will be given to China.

In the previous chapter, I discussed some of the results of the financial analysis such as a first year budget, cash flow analysis for a five year period, and the break even analysis. After I discuss some marketing analysis information, I will relate this financial analysis information with the economic analysis to create some strategic goals.

The section of the marketing analysis that I am going to discuss is defined by Root and Koenig (2005): competition, pricing, advertisement and selling; there are similarities between Root and Koenig's concepts to the Dolan conceptual model (Mackie, Summer 2010). According to George, there is a lot of competition that offer design services to the automotive industry in the Texas; the profit margin is relatively small. (G. Vittattoe, personal communication, May 2010) Pricing, advertisement, and selling should be topics that the strategic goals should cover according to the HCF.

George wanted to initially sell the design services at 10% discount below the current customer price; according the financial analysis, the discount would bankrupt the company. The pricing strategic goal for the first year is to offer the customers the same current customer price for the projects; the lowest discount that can be offered will be 3% below the current customer price.

The overall goal for the first year will be to retain all of George's current customers with the new company. The promotional strategy will be directed at convincing George's current customers to continue to buy design services from George and the new company. Any advertisement strategies will be used to expand the business opportunities that George's existing customers have to offer, especially George's Chinese customers. According to the economic analysis, George's Chinese customers should have plenty of business activity that is forecasted to continue for the next couple of years. If the customers want to continue with the same workmanship, professional courtesy, and quality as before, they should continue to buy from George. George will continue to be the seller as well. All the promotional revenue will be directed to enhance or maintain the relationship between George and his clients. A budget for dinners, shirts/pens/business cards with the new company logo, a website of the new company will be allocated.

The strategic financial goal for all the years is to end the business year with a positive cash flow. George has passionately mentioned that he wants a business with good cash flow instead of fast company growth size. Another strategic goal is to make sure to always pay workers on time; George's motivation to restore equity has made this a priority. The long term pricing strategic goal is to increase the price at least 6% to be able to maintain a positive cash flow according to the financial analysis. The short term financial strategic goal is to sell a maximum of fourteen projects; the proportion of larger projects sold should be more than half.

Identifying the organization capabilities is the next major concept in the HCF. What are the collective capabilities needed to meet the company's strategic goals? Only one strategic goal will be discussed here: the long term strategic goal of always ending the business year with a positive cash flow. What must the organization know how to do to end up with a positive cash flow? There are many factors that could lead to a positive

cash flow. Below are several company capabilities that have been identified (Kyle Lewis, personal communication, November 2010):

- The firm needs to know how to maintain an accurate balance sheet by using well-established accounting and bookkeeping practices. (Capability A)
- The company needs to know how to evaluate the purchase of new large assets and potential projects using NPV and PI analysis. (Capability B)
- The company needs to know how to monitor and minimize overhead costs. (Capability C)
- The company needs to know how to maintain high productivity in the workforce. (Capability D)
- The company needs to know how to accurately scope project labor hours and material costs. (Capability E)

What Implementation "Levers" are needed to realize the organization capabilities and to accomplish the strategic goal of ending each business year with positive cash flow?

Below are a "Levers" that correspond to the above listed capabilities.

- Business hours of operation will be from 9 – 6. (Capability D)
- Performance reviews will incorporate project evaluations. Project evaluations will be composed of the team member's performance on each project; the 'information manager" will be the project manager. (Capability D)
- Try to motivate the technician's performance by correlating their performance on projects to their annual compensation. (Capability D)

- When ordering any parts or materials, a purchase requisition form will be required to be filled out and signed by upper management. (Capability A)
- Create a company culture of cost-consciousness by stating it as a company value in the operating procedure and employee handbook. (Capability C)
- Cost-consciousness will be used as criteria for all employee performance reviews. (Capability C)
- Develop a training program to maintain good project management practices that will be stated in the operating procedure. (Capability E)
- Develop a fiscal evaluation training program on NPV and PI methods. (Capability B)
- Have an external training program to develop employee skills in accounting and bookkeeping. (Capability A)
- Have an upgrade computer policy that requires new employee computers every three years. (Capability D)

What organization structure, Knowledge Skills Talent Behaviors (KSTB's), and work process are needed to accomplish this goal?

The correct organization structure is a vital foundation to a streamlined business entity. Besides accomplishing the strategic goals, Root and Koenig (2005) have other specific items to consider when selecting a business entity type:

Liability needs – How much protection from the company's actions do you personally need?

Capital and Financial requirements – How much capital will you need in the next couple of years? How are you going to raise that capital?

Size – How big are you going to be in the first year, ten years, etc?

Scope of Your Business Operation – Are you doing business locally, state-wide, across states, or internationally? (p. 50)

The six business types listed by Root and Koenig (2005) are sole proprietor, general partnership, limited partnership, limited liability company (LLC), limited liability partnership, and corporation. (p. 48) The limited liability company offers limited liability protection (like a corporation), is taxed once, has the ease of formation unlike a corporation, and has a flexible profit distribution. The LLC provides the best option for George and me in many aspects. We will not have to spend time or hire someone to keep track of formal minutes, and keep record of all resolutions like a corporation. Another obvious aspect is there is no double taxation like a corporation which will increase our profit margin and cash flow. Finally, the most important reason for selecting the LLC is that the LLC allows you to set up the profit distribution. As an investor partner, I will be able to negotiate with George a profit distribution that we can agree on and keep changing to our evolving needs.

Development of KSTB's for the future employees will be done when the time for interviewing for new employees gets closer. Recruitment/Selection levers will be generated in the future. At this planning stage, there is no plan of hiring anyone within the first two years of business operation.

An operating procedure will be developed which will provide a work process that will help accomplish some of the strategic goals. Many recommendations from George will be incorporated in the operating procedure as well. Many of the work process levers and performance management levers will be directly stated and defined in the operating procedure. The company values will also be included in the operating procedure.

Here are some of those company values (G. Vittattoe, personal communication, May 2010):

- Technical excellence as the standard of performance.
- Effective teamwork with a highly engaging style of management.
- A working environment that fosters innovation, creativity, trust, and respect for each other.
- Provide customer satisfaction with not only our technical services but with our courtesy.

Since the business will be an LLC, the operating procedure will contain the main elements of an LLC operating agreement. The main LLC operating agreement components should be:

- A breakdown of the ownership percentage of each member
- The privileges and rights of the members (Mancuso, 2009, p.5)
- A detailed plan showing the profit/loss distribution (Mancuso, 2009, p.5)
- The voting rights of members (Mancuso, 2009, p.5)
- The rules for the cessation of a member due to interest/death/disability
- The organization structure

The operating procedure will serve as the live document that will be annually changed throughout the lifetime of the business. The process of submitting travel expense reports will also be included in the operating procedure.

CONCLUSION

By using the NPV and PI calculations, I have identified that under certain conditions my investment in the business would be a profitable investment. To avoid a sure failure of the business, some of the crucial constraints have been indentified: an annual sales goal of a maximum of 14 projects and no less than 12 projects, no major asset purchases like a new forklift for the first five years, and no additional employees for at least the first two years unless the employee would be an experienced knowledge worker like George.

The Human Capital Framework and the business plan components are helping develop the strategic goals, capabilities, and levers that will be used in the development of a business operation procedure. George's desire for respect, equity, and safety in the workplace are values that will be reflected in the operating procedure as well.

With my rough analysis, I have provided George an understanding of the financial results of different employee business models. I have also provided him a more accurate estimate of how much capital is required to start up the business. Part of my research also found the different ways of mitigating our personal risk with the business: selecting the LLC as the business entity and discovering the need to purchase Commercial Liability Insurance and Workers' Compensation Insurance. One of our strategic goals is to increase the sales revenue with George's existing customers especially from China. Our promotional budget should focus only on George's existing customers. As a result of my analysis, I have already decided to invest in this small business venture. Even with all the analysis, George has not yet decided to accept the high risk and reap the rewards of

owning a small business. Only time will tell, but as any good friend would do, I will support his decision either way.

References

Black's Law Dictionary (5th Ed.). (1979). Eagan: West Publishing.

Durbin, D. & Krisher, T. (October 1 2010). U.S. Auto Sales Sluggish Despite New Models; Automakers Expect Autumn Gains. The Canadian Press.

Fishman, Stephen. (September 2008). Consultant & Independent Contractor Agreements. Berkeley: NOLO.

Fitzgerald, Rebecca. (October 6 2010). Johnson Controls Inc.

Funk, Josh (August 16 2010). Buffett's Company Rebuilds J&J Stake to 41.3 Million Shares, Trims Kraft, ConocoPhillips. The Canadian Press.

GlobeNewswire (October 7 2010). Resource Exchange of America Corporation Notices Continued Increase in Chinese Car Sales Adds to Steel Demand.

Kamp, Jon. (October 5 2010). US Medical Device Industry Pushes Back Against Proposed FDA Changes. Dow Jones Business News.

Kiernan, Paul. (July 16 2010). Mexico Security Concerns Lead Foreign Firms To Scale Back. Dow Jones International News.

Lewis, K. (Spring 2009). ENM380 - Managing People and Organizations. *Lec Module 1a sv*, pp. 12-22. Austin: Class Lecture Notes.

Mackie, Kate. (Summer 2010). CLEE Marketing Workshop. p. 5. Austin: Workshop Lecture Notes.

Mancuso, Anthony. (2009). Form Your Own Limited Liability Company (6th Ed.). Berkeley: NOLO

Maslow, A. (1943). A theory of human behavior. *Psychological Review* , pp. 370-398.

Rockoff, Jonathan D. (September 30 2010). Quality control at J&J draws U.S. scrutiny. The Wall Street Journal Europe.

Root, H. & Koenig, S. (2005). The Small Business Start-Up Guide. Naperville: Sourcebooks, Inc.

Ross, S.A., Westerfield, R.W., Jaffe, J. & Jordan, B.D. (2009). Corporate Finance Core Principles & Applications. New York: McGraw-Hill.

SignalTrend Inc. (2010, August). Interest Rate Forecasts. www.forecast-chart.com. 27 August 2010.

Truly, T. & Warda, M. (2006). How to Start A Business in Texas. Naperville: SPHINX Publishing.

Texas. (1973). Deceptive Trade Practices-Consumer Protection Act. Texas Legistlature: Austin. [Laws]

Texas Department of Insurance. (2010).

Torres, Z. (2010, August 22). US-Mexico Border Garners National Attention. www.elpasotimes.com. 26 August 2010.

U.S. Department of Commerce. (2000).

U.S. Equal Employment Opportunity Commission. (2010).

U.S. Small Business Administration. (2010).

United States. (1994). United States Code Title 35 Sec. 271 (c). Office of the Law Revision Council of the House of Representatives: Washington, D.C. [Laws]

Völkel, Christian. (September 2010). German Car Maker to Build New Engine Plant in Mexico. IHS Global Insight Daily Analysis.