

Managing by the Numbers

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Problem

One of the biggest problem faced by the surveying industry in general and my firm in particular, is the entrance of a substitute product to the market. This substitute is replacing a product that has formed the foundation for many surveying businesses. This paper demonstrates the use of a cost, volume profit analysis by illustrating the effect that this substitute produce has on the surveying industry.

Traditionally, surveys have been used as "insurance" to protect mortgage lenders from defects in title that reduce the value of the property used as collateral. A survey uncovers these defects prior to the funds being transferred. Even in the rare event that the surveyor misses a defect, every survey firm is obligated to carry professional liability insurance that will correct any losses incurred by professional errors.

Recently, Title Insurance was offered in Ontario for the first time. This product provides the lender of funds with insurance against any defects that might affect title. It is a product that has been offered in the United States for several decades so it is not a new product for those offering it. Title insurance is 1/3 to 1/4 of the price of a survey and it does fulfill the client's immediate need to obtain financing. This need was previously filled by the survey. As a result, title insurance has eroded much of the market for Surveyors' Real Property Reports

(SRPR). Clients do use surveys for other reasons so a portion of the market will remain.

Description of Concepts

The concepts that marketing can offer to examine this problem consist of pricing principals and a market research process. There are six steps in determining the price of a product. These are outlined with a description of their applicability in Figure 2. These concepts are of primary importance in understanding the current situation and in developing a response. In addressing the pricing issue I realized that market research provides an integral component of the response to the competitive threat of title insurance. A five-step market research process is outlined in Figure 3.

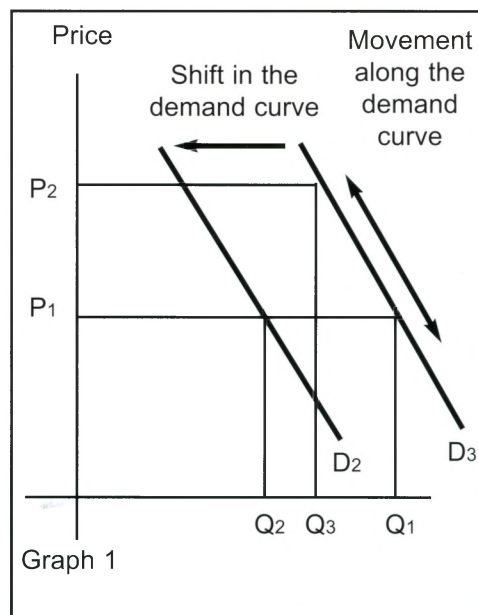
Application of Pricing Concepts

There are constraints in the survey industry that the members have placed upon themselves. Generally the firms are small with the principals being heavily involved in the day to day activities of surveying. This leaves little time to consider any marketing or any management accounting practices. Over the years there have been some in the profession that have asked questions like, "Do you know what it costs to open your door each day?" But this type of question has traditionally not been well received or well answered. This is part of the pure competition that keeps margins in the profession very low.

Over the years fluctuations in the price different firms charge has moved the demand along the curve back and forth between Q1 and Q3 with the price changing between P1 and P2. The demand curve itself has also shifted around D1 depending on the state of the economy, anti-trust threats and other short term fluctuations. Title insurance has fundamentally changed the marketplace and caused a permanent shift in the

demand curve from D1 to D2. As title Insurance becomes accepted, the curve will move further and further to the left of D2.

This decrease in demand will reduce the size of the overall market. Survey firms will respond by attempting to gain more share of the smaller market, accepting fewer jobs, expanding their geographic reach and by finding alternative products.



The affect of this can be demonstrated using a cost, volume, profit analysis. Figure 1 illustrates the current situation for my firm by analyzing the market mix and applicable profit margins. Currently I complete 75 Surveyors' Real Property Reports per year at a selling price of \$900.00 each. In the current situation (prior to tile insurance) this product provides the lowest contribution margin (39%) of all products in the marketing mix. My first option is to reduce the price of an SRPR and keep the quantity the same. If this option is successful, I would have more market share of a smaller market. But the contribution margin of the product would be reduced to 8% and the overall profit of the firm reduced to 2%. Clearly this is not a

viable alternative.

My second option is to continue to service the people that want a survey for a reason other than obtaining a mortgage. I estimate this to be about 33% of my existing business. These are customers who want a quality product and are willing to pay a premium price for it.

Two things happen when the volume is reduced to 1/3 of the current volume. The contribution margin of the product remains the same but the overall profit of the firm is reduced from 11% to 5% (Appendix 2). This occurs because the fixed costs remain unaltered. This creates excess capacity in the firm that can be filled by finding alternative products.

The three remaining concepts of pricing are not directly related to the problem discussed here. If I operated in the growth stage of the market then value pricing would enhance my competitive position and perhaps allow me to charge a higher rate than the competition. But in a market in severe decline the clients for the most part do not want the product regardless of its perception. The client's immediate financial need is fulfilled by a substitute product that is considerably less expensive. There is not a published or quoted price as each project is estimated on an individual basis. Sometimes adjustments are made to the price for a variety of reasons. For example, the client may provide additional information that will be helpful in preparing the survey and reduce the cost.

As a result of the pricing analysis completed in this paper, I have decided to not compete on the basis of price, not to respond to the competitive threat of title insurance, but instead, to look for a different product to fill the void created by the loss of 50 SRPR's per year. I have taken on several small consulting projects over the last year and wonder if I can increase my workload in this area by focusing on project management. Market research should provide me with the answer to this question.

Application of Marketing Research Concepts

There are five steps in market research and the first step is concerned with identifying the problem. The situation that has created the problem is outlined above. One solution is to focus on project management and this may take two directions. I could manage projects within my own industry or work outside my primary area. This would be either in the Information Technology sector or in Engineering. The results of the market research will indicate the direction to proceed.

The second step includes exploratory research into the various directions. I would start by speaking to the larger survey firms that complete large projects and often have a need for a project manager. I would also speak to specialists in project management that offer consulting services to the IT sector. This is typically called "mother-in-law" research since it is primarily talking to friends. It would also be appropriate to contact project management consulting firms and potential clients to get their thought on offering services outside my immediate area of expertise. Information from the consulting firms would have to be considered very carefully. If they said that the idea had merit it would mean that the demand for this type of work is high and the consequent probability of success is high. But negative comments could be treated with suspicion and would indicate that more research would have to be conducted to properly determine a demand curve.

Secondary data could be obtained from the local chapter of the Project Management Institute. This could contain the number of projects that consultants worked on, the duration of the projects and the experience needed to successfully manage it. The number of local PMI members providing consulting services could also be obtained and this would indicate the position of the supply curve. Primary data would not be used in this situation.

The data analysis and interpretation is crucial to the success of this endeavour. The research data must be used to identify the number of potential contracts. Probabilities of obtaining contracts from different sectors could be identified and used in the decision modeling. Of course the contribution margin for this type of work must be analyzed and the cost/volume/profit (CVP) analysis previously described must be executed. The marketing research will result in an identification of the action. This information gathered can then be used to develop a viable implementation plan.

Results

Although I recognized that pricing has always been an issue, this is the first time that I have documented a comprehensive pricing policy that incorporates all the aspects that influence price. I had an intuitive feel for my market but I was still surprised by the results.

I initially thought that segmentation would be the second concept to analyze. Using that concept I could have identified which areas of the existing market would be most attractive to maintain or increase profits. After seeing the results of the pricing study I quickly abandoned this idea and determined that I needed market research to help determine how I could maintain the workload of my firm by entering different markets. The tangible results are the conclusion that I must change my promotional activities and no longer promote Surveyors' Real Property Reports. I believe that this market will decline even further and I must address alternative sources of business. The pricing study confirms this. The marketing research provides me with a method to change my business to solve the declining demand for one product in the marketing mix. This particular project has helped me to clearly see the current situation and to develop a method to determine the direction that I should lead my firm.

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Figure 1 ~ Contribution/Breakdown analysis (CVP)

Current Situation - Prior to Title Insurance ~ Figure 1

There are four things in operation here: variable costs and contribution margin vs fixed costs and breakeven analysis. First we must determine the variable cost for each product type. This can be subtracted from the selling price to calculate the contribution margin of that product.

The total contribution margin of all products can then be compared to total sales to get a ratio of Contribution Margin over sales (CM/Sales). This tell us how much 'profit' in relation to variables costs we make but of course before this is truly profit we must take into account the fixed costs. These fixed costs must be paid out of the contribution margin prior to achieving any real profit.

Product	Quantity	Selling Price	V/C unit	C/M unit	Total Sales	Total VC	Total CM	CM%
SRPR	75	900	550	350	67500	41250	3750	39%
R Plan	47	1600	750	850	75200	35250	39950	53%
Topo Plans	21	3200	1100	2100	67200	23100	44100	66%
Management	6	7500	3000	4500	45000	18000	27000	60%
Total Fixed Costs are:		110000	Profit	\$27300	\$254900	\$117600	\$137300	54%
Breakeven Point:		\$227600	Profit %	0.11				

Lower Selling Price for the SRPR

Product	Quantity	Selling Price	V/C unit	C/M unit	Total Sales	Total VC	Total CM	CM%
SRPR	75	600	550	50	45000	41250	3750	8%
R Plan	47	1600	750	850	75200	35250	39950	53%
Topo Plan	21	3200	1100	2100	67200	23100	44100	66%
Management	6	7000	3000	4500	45000	18000	27000	60%
Total Fixed Costs are:		110000	Profit	\$4800	\$232400	\$117600	\$114800	57%
Breakeven Point:		\$227600	Profit %	0.02				

Lower Quantity Supplied for the SRPR

Product	Quantity	Selling Price	V/C unit	C/M unit	Total Sales	Total VC	Total CM	CM%
SRPR	25	900	550	350	22500	13750	8750	39%
R Plan	47	1600	750	850	75200	35250	39950	53%
Topo Plans	21	3200	1100	2100	67200	23100	44100	66%
Management	6	7500	3000	4500	45000	18000	27000	60%
Total Fixed Costs are:		110000	Profit	\$9800	\$209900	\$90100	\$119800	57%
Breakeven Point:		\$200100	Profit %	0.05				

Figure 2 - Six Steps in Setting Price for a Surveyors' Real Property Report

Step	Present Situation	Recommended Change	Anticipated Results
1. Constraints	<p>The life cycle of the service is nearing its end. Almost all houses have been surveyed at least once and some even 2 or 3 times.</p> <p>The type of competition is a major factor. In the Toronto area it is <i>Pure Competition</i> with many sellers who follow the market price.</p> <p>The cost of our service is higher than the price of some of our competitors. There are standards that must be followed but there are ways to cut corners. This has lowered the price that the market is willing to pay.</p>	<p>No change is recommended. These are external forces that are beyond the control of a small firm in the market.</p> <p>It is possible to reduce costs by compromising some aspects of the service but it is not possible to reduce them to the level required to be the low price producer. The strategy has been to charge a premium price and provide a superior service. Changes to this strategy are not recommended.</p>	
2. Demand and Revenue	<p>Over the last 15 years the demand has remained relatively constant. There have been shifts along the demand curve as surveyors vie for market share. The demand curve itself has shifted slightly with the economy. Currently there is a major shift in the demand curve. The survey is often provided to illustrate property holdings for the mortgage lender. A substitute product, Title Insurance is fulfilling the need for about 25% of the cost of a survey. This is causing a major decrease in the demand.</p>	<p>This is an external force that is a substitute. I have accepted that there is nothing that I can do to change the demand of the SRPR so the recommended change is acceptance of the situation along with a desire to find new services that surveyors skills can be used for.</p>	<p>This analysis indicates that the other product lines should be pursued rather than the traditional SRPR prepared by surveyors.</p>
3. Cost, Volume, Profit Analysis	<p>A rudimentary cost, volume, profit analysis in relation to the rest of the business is attached. Various price and quantity levels are included to reflect the price charged by the low price provider, my firm's traditional price and the expected change in quantity.</p>	<p>This offers confirmation that the Surveyors' Real Property Report will have less importance in the company's business. The business needs a change to get away from this product line.</p>	<p>This also indicates that other product lines should be pursued.</p>
4. Approximate Price Level	<p>In a mature market such as surveying most of the demand-based methods for setting an approximate price are not appropriate. The exception is value based pricing where perceived benefits could be offered while maintaining costs.</p> <p>Target Profit Pricing has historically been used to determine price. This leads to a price that is above the competitors but certain clients perceive benefits of a superior product.</p>	<p>Packaging changes such as binding the report and offering photographs of the dwelling could change the perception of the product. This could help develop a value based pricing system that will help differentiate the product from my competitors.</p>	<p>I do not anticipate more sales from the use of value based pricing. Based on the CVP and demand curve analysis, the market for this product is disappearing.</p>
5. Quoted Price	<p>There is not a published price that clients can refer to and each project is unique so it is usual to quote a price on the telephone based on a series of questions that are posed to the customer. In uncertain situations a range of prices are provided to assure that the profit margin is met.</p>	<p>No changes in procedure are recommended here. This gives the opportunity to speak to a potential customer and identify their need.</p> <p>However, it is possible to tailor the price to that customer need. Some customers</p>	

Figure 2 - Continued

5. Quoted Price continued		want to have more information and this could be incorporated into the price. This goes along with value based pricing.	
6. Adjustments to List or Quoted Price	Adjustments to the quoted price are rarely made. Typically surveys are prepared for an individual customer. However, lawyers and real estate agents sometimes provide repeat business. I have always shied away from giving either a reduced fee or a referral fee to repeat business customers. If I am surveying 2 houses that are adjoining, the second one is 1/2 price.	No change is recommended here.	

Figure 3 - Five Steps in Marketing Research

Step	Present Situation	Anticipated Results
1. Problem Definition	One of the most recent components of the marketing mix for my firm is project management consulting. I have had a few small consulting contracts and wonder if focusing on the project management portion of this opportunity will provide the means to replace the loss of the SRPR. There are 2 possible directions within this framework. It is possible that I could manage large projects for large surveys firms or manage strategic process for firms outside my own industry.	An identification of a possible future direction for my firm.
2. Exploratory Research	Start with the identification of informed sources both within and outside my own industry. I can start with the larger geomatics firms. I would limit myself to 3 to identify perspective. Then I will talk to project management consultants. It is possible to that secondary data will be able to be obtained from the Project Management Institute.	A clear definition of the potential of project management playing a large part of my business.
3. Primary Data Generation	In this situation exploratory research should provide enough information to determine whether to proceed with this initiative.	
4. Data Analysis and Interpretation	Here, there must be an analysis of the number of potential contracts, along with the probability of obtaining them. Included in the analysis must be an indication of the potential revenue and the contribution margin. This is an ideal situation to apply the decision modeling that we are currently studying in statistics.	A decision as to whether to move ahead with this endeavour or not.
5. Recommendations and Implementation	Suggestions for action on actually obtaining contracts must be made here.	