CivEnv 205 -- Economics and Finance for Engineers

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Case Study 2- Smart Software: A decision analysis[1]

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While El Niño is pouring its rain on northern California, Charlotte Rothstein, CEO, major shareholder and founder of Cerebrosoft, sits in her office, contemplating the decision she faces regarding her company's newest product, Brainet. This has been a particularly difficult decision. Brainet might catch on and sell very well. However, Charlotte is concerned about the risk involved. In this competitive market, marketing Brainet also could lead to substantial losses. Should she go ahead anyway and start the marketing campaign? Or just abandon the product? Or perhaps buy additional marketing research information from a local company before deciding whether to launch the product? She has to make a decision very soon and so, as she slowly drinks from her glass of high protein-power multivitamin juice, she reflects on the events of the past few years.

Cerebrosoft was founded by Charlotte and two friends after they had graduated from business school. The company is located in the heart of Silicon Valley. Charlotte and her friends managed to make money in their second year in business and continued to do so every year since. Cerebrosoft was one of the first companies to sell customizable AI applications for multimedia companies. Two of the products generate 80 percent of the company's revenues: Audiatur and Videatur. Each product has sold more than 100,000 units during the past year. Customers download a trial version of the software, test it, and if they are satisfied with what they see, they can purchase the product. Both products are priced at $75.95.

Charlotte is interrupted in her thoughts by the arrival of Jeannie Korn. Jeannie is in charge of marketing, and Brainet has had her particular attention from the beginning. She is more than ready to provide the advice that Charlotte has requested.

"Charlotte, I think we should really go ahead with Brainet. The software developers have convinced me that the current version is robust and we want to be on the market with this as soon as possible! From the data for our product launches during the past two years we can get a rather reliable estimate of how the market will respond to the new product, don't you think? And look!" She pulls out some presentation slides. "During that time period we launched 12 new products altogether and 4 of them sold more than 30,000 units during the first 6 months alone! Even better: the last two we launched even sold more than 40,000 copies during the first two quarters!" Charlotte knows these numbers as well as Jeannie does. After all, two of these launches have been products she herself helped to develop. But she feels uneasy about this particular product launch. The company has grown rapidly during the past three years and its financial capabilities are already rather stretched. A poor product launch for Brainet would cost the company a lot of money, something that isn't available right now due to the investments Cerebrosoft has recently made.

[1] This case study was written by Karl Schmedders and Molly Stephens. It was updated by Hang Shu.

Later in the afternoon, Charlotte meets with Reggie Ruffin, a jack-of-all-trades and the production manager. Reggie has a solid track record in his field and Charlotte wants his opinion on the Brainet project.

“Well, Charlotte, quite frankly I think that there are three main factors that are relevant to the success of this project: competition, units sold, and cost — ah, and of course our pricing. Have you decided on the price yet?”

“I am still considering which of the three strategies would be most beneficial to us. Selling for $50.00 and trying to maximize revenues — or selling for $30.00 and trying to maximize market share. Of course, there is still your third alternative; we could sell for $40.00 and try to do both.”

At this point Reggie focuses on the sheet of paper in front of him. “And I still believe that the $40.00 alternative is the best one. Concerning the costs, I checked the records; basically we have to amortize the development costs we incurred for Brainet. So far, we have spent $800,000 and we expect to spend another $50,000 per year for product support.”

Reggie next hands a report to Charlotte. “Here we have some data on the industry. I just received that yesterday, hot off the press. Let’s see what we can learn about the industry here.” He shows Charlotte some of the highlights. Reggie then agrees to compile the most relevant information contained in the report and have it ready for Charlotte the following morning. It takes him long into the night to gather the data from the pages of the report, but in the end, he produces three tables, one for each of the three alternative pricing strategies. Each table shows the corresponding probability of various amounts of sales given the level of competition (high, medium, or low) that develops from other companies.

Table 1: Probability distribution of unit sales, given a high price ($50)

	Level of Competition		
Sales	**High**	**Medium**	**Low**
50,000 units	0.05	0.15	0.3
30,000 units	0.2	0.2	0.35
20,000 units	0.75	0.65	0.35

Table 2: Probability distribution of unit sales, given a medium price ($40)

	Level of Competition		
Sales	**High**	**Medium**	**Low**
50,000 units	0.25	0.4	0.4
30,000 units	0.25	0.3	0.5
20,000 units	0.5	0.3	0.1

Table 3: Probability distribution of unit sales, given a low price ($30)

	Level of Competition		
Sales	**High**	**Medium**	**Low**
50,000 units	0.65	0.4	0.5
30,000 units	0.2	0.5	0.45
20,000 units	0.15	0.1	0.05

The next morning Charlotte is sipping from another power drink. Jeannie and Reggie will be in her office any moment now and, with their help, she will have to decide what to do with Brainet. Should they launch the product? If so, at what price?

When Jeannie and Reggie enter the office, Jeannie immediately bursts out: “Guys, I just spoke to our marketing research company. They say that they could do a study for us about the competitive situation for the introduction of Brainet and deliver the results within a week.”

“How much do they want for the study?”

“I knew you’d ask that, Reggie. They want $10,000 and I think it’s a fair deal.”

At this point Charlotte steps into the conversation. “Do we have any data on the quality of the work of this marketing research company?”

“Yes, I do have some reports here. After analyzing them, I have come to the conclusion that the marketing research company is not very good in predicting the competitive environment for medium or low pricing. Therefore, we should not ask them to do the study for us if we decide on one of these two pricing strategies. However, in the case of high pricing, they do quite well: given that the competition turned out to be high, they predicted it correctly 80 percent of the time, while 15 percent of the time they predicted medium competition in that setting. Given that the competition turned out to be medium, they predicted high competition 15 percent of the time and medium competition 80 percent of the time. Finally, for the case of low competition, the numbers were 90 percent of the time a correct prediction, 7 percent of the time a ‘medium’ prediction and 3 percent of the time a ‘high’ prediction.”

Charlotte feels that all these numbers are too much for her. “Don’t we have a simple estimate of how the market will react?”

“Some prior probabilities, you mean? Sure, from our past experience, regardless of the selected pricing level, the likelihood of facing high competition is 20 percent, whereas it is 70 percent for medium competition and 10 percent for low competition,” Jeannie has her numbers always ready when needed.

All that is left to do now is to sit down and make sense of all this. . . .

Case Study Questions:

(a) For the initial analysis, ignore the opportunity of obtaining more information by hiring the marketing research company. Identify the alternative actions and the scenarios that may realize. Conduct a decision analysis to find the preferred alternative.

(b) Now consider the possibility of conducting the market research study. Should Cerebrosoft pay the $10,000 for the marketing research? This part involves finding the value of partial information related to the level of competition in the event that Cerebrosoft chooses to go with the high price strategy.

(c) What is the overall recommendation for Cerebrosoft? Some extra credit (10%) can be earned by using the data that describe the marketing firm's track record.