

Value Creation and Profit Optimization

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version 2003 12 08 (replacing earlier versions of 2002 03 12 and 2002 06 07).

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Abstract

The present paper develops a basic framework for evaluating and optimizing profits in a business operation. In developing a business we are often faced with an infinity of choices ranging from what products or services to sell and what customers to target to how to structure and manage the organization. To support the decision-making process a semi-quantitative dimension is here added to the traditional strategic scenario planning. It consists of a general-purpose seven-step evaluation process:

- (1) The starting point is a list of strategic options, as they may have been identified during “conventional” strategic planning.
- (2-3) The next steps are to identify who will influence the value creation process, and what value drivers each of them use to influence it.
- (4) For customers representative of different segments we can evaluate the value to the customer, the risk to the customer and the relative market power between buyer and seller. The paper explains how this can be related to the market price that each of these customers is likely to be willing to pay.
- (5) While the income is critical, so is the cost: the following step is to analyze the cost structure and understand how it scales with market size.
- (6) By combining the results from the two previous steps it is possible to find the optimal profit as a function of volume, value drivers and the other parameters.
- (7) In the final step the strategic implications of the various options are integrated with other knowledge to form the basis for selecting a winning business strategy.

An example of a yet-to-be consumer product is used to illustrate the process.

Keywords: cost, customer specific cost, market power, pricing, profit optimization, profits, radical innovation, risk discount, strategic scenario planning, value chain, value creation, value drivers, value net

JEL classification: B40, C10, C13, C14, C40, C61, C67, C70, D10, D20, D40, D46, G12, L10, L11, L21, L68, M10, M11, M13, M19, M30, O14, O32

Introduction

The paper is built around a case evaluating the potential of an Advanced Kitchen Center, a hypothetical new product. An Advanced Kitchen Center is a computer driven kitchen appliance that performs simple kitchen tasks such as loading and opening food containers, measuring by weight or volume, mixing, stirring, boiling, frying and baking. Ideally it will be able to cook delicious meals based on recipes stored in the computer, but today there is a long way before this kitchen center can be considered either economical or practical to use. Customers will start embracing this product only when all ingredients are sold in the right type

of containers, easy to use software is available and there is an infrastructure of service and support. The problem is a classical business problem. Inventing a product can propel business profits, but when the new product is part of a complex value net, all the network externalities need to be in place before the product will start to take off and profits can only be harvested if the company has sufficient market power to appropriate value from this value net.

It can be a real challenge to understand how each of the many interactions among all the various people and businesses in the value net will impact the bottom line, however, without that understanding it is difficult to select a strategy. To overcome this challenge this paper outlines a seven-step method as described below (Figure 1).

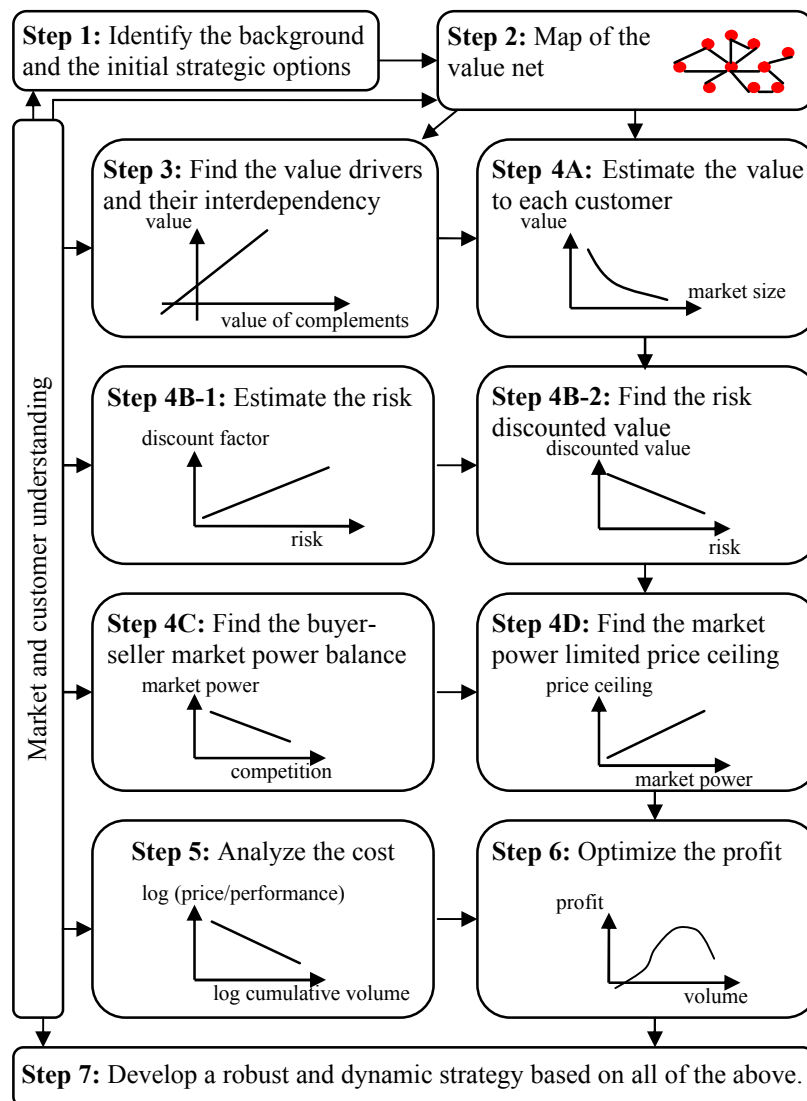


Figure 1. Outline of the method used in analyzing profit opportunities and taking strategic decisions.

Step 1: Identify Initial Strategic Options

For the purpose of discussion it is assumed that preliminary work has identified and evaluated four alternatives (1) don't invest, (2) focus on commercial users, (3) focus on a small market

of high end consumers or (4) develop a consumer mass market. These options translate into three key questions:

1. Is this business opportunity worth pursuing or is it better to invest in a different opportunity?
2. Should this Kitchen Center be sold to home users or commercial users?
3. What is the right pricing strategy? Should this be positioned as a high priced luxury item or sold as a mass market appliance?

After having looked at a conventional business plan most managers will take a decision on questions like this, however, the following discussion will provide a much firmer basis for taking those decisions.

Step 2: Map the Value Net

We are all too used to think of value being something delivered by a supplier. However, in most modern products the customers are better than anybody else at creating value for themselves and as a supplier the best we can do is to facilitate this process. The unique dishes one as a user is able to create using the Advanced Kitchen Center is after all what makes the whole experience worthwhile.

In addition to the Advanced Kitchen Center supplier there are many other entities who are critical in helping the user create value, such as the computer supplier who provides a computer to control the Advanced Kitchen Center, the books instructing the users how to cook in this new way and the advertisement agent who creates the dreams to be fulfilled. The value net contains all the people and organizations, called nodes, which have an impact on value, either by creating value or by destroying it. While the traditional value chain focuses on the core suppliers, distributors and customers, the value net also includes the ones that directly or indirectly interact with this core group. For example, if the customer and five of his/her friends have a club on automated cooking then the social interactions in this club can contribute to the value that the customer gets out of owning an Advanced Kitchen Center. This club is therefore part of the value net although there is no monetary transaction that ties it to the conventional value chain.

The purpose of mapping out the value net is to better understand how the user of an Advanced Kitchen Center will create value. Not all nodes are obvious, for example, it is easy to overlook a not-yet-existing company outsourcing catering work to individuals working at home, thereby helping the owners of Advanced Kitchen Centers create more value. Or it may enter an existing value net in a new way, for example a fast-food restaurant franchise chain may use it as a tool for achieving food consistency across the different franchise stores. A subset of the value net surrounding the user of an Advanced Kitchen Center is shown in Figure 2. In this figure the nodes are grouped according to the role they play: (1) the ones who act as suppliers, (2) the ones who create value through market interactions and (3) the ones who take part in, or influence, the consumption process.

Along the outer circle is listed a variety of nodes (in boxes) and inside are shown some of the instruments (text without boxes) they use to influence the value creation. The second layer of nodes placed outside the outer circle shows examples of second tier entities that indirectly influence the value creation through the nodes along the outer circle. Models based on historical financial records have revealed that second, and sometimes even third, tier nodes can significantly impact the value to the user. It can, however, be a daunting exercise to look

at all these higher order nodes, because their number goes up exponentially as they become more distant to the user.

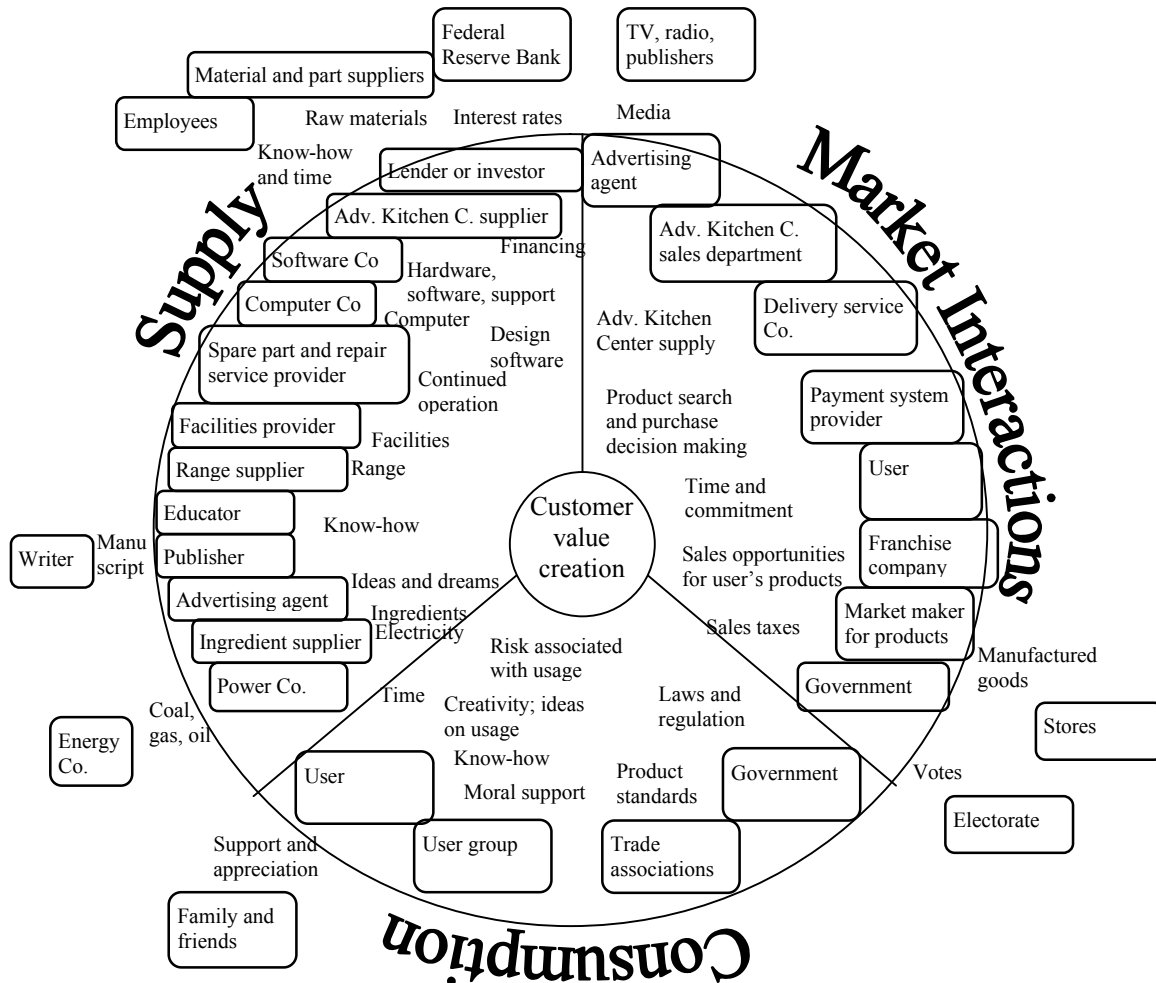


Figure 2. Some of the nodes (in boxes) in the value net for the Advanced Kitchen Center are shown along with some of the value drivers they each provide (listed next to the boxes). They are grouped according to how they fall into three basic roles: supply-, market interaction- and consumption- related value creation.

In this simplified value net for the Advanced Kitchen Center we have one supplier selling directly to the end user. But who is the end user really? Here are some examples:

1. A *home user* who cooks meals for the family.
2. A *caterer* making meals to sell to others working out of home.
3. A *commercial user* who for example has a restaurant or a hospital.

Each of these three different types of end users will benefit in different ways from the various nodes in the value net. The caterers could benefit from a franchise company that can give brand equity and technical support to their in-home production. The commercial user may be particularly sensitive to nodes that can provide timely service and spare parts. In the next section we will look at ways of quantifying what is important to a given user.

Step 3: Identify the Value Drivers

The price that a customer is willing to pay for a product will depend on the value the customer expects to receive from the product. A value driver is a reason for an offering to have value to the beholder, e.g. a fruit may have value drivers like nutrition and flavor in the eyes of the node eating it. We can then look at the value as a combination of all the value drivers that the different nodes are providing. If an essential complement to the product, let's say electricity, is not present then the value of the entire Advanced Kitchen Center vanishes. If there are many supporting offerings, e.g. self-help guides, evening classes and user communities, then the value goes up. Table 1 shows a few of the exchanges in the value net related to the Advanced Kitchen Center and a qualitative assessment of their relative importance.

Node in value net	Delivered to user	Received from user	Value	Market Power	Transaction flow
System supplier	Hardware, customer support	Money, user feedback	High	High	One time
Ingredient suppliers	Ingredients	Money	High	Low	Ongoing
Power co.	Electricity	Money	High	Low	Ongoing
User group	Support, ideas, social aspects	Support, ideas	Medium	Low	Ongoing
Publisher	Tutorials	Money	Medium	Low	One time
Government	Legal limitations	Sales tax	Low	Very high	Ongoing

Table 1. Value exchanges for selected nodes interacting with the user.

Step 4: Buyer Side and Potential Market Price

Customer Value

Quantifying the overall value by combining the effect of the various value drivers means that each and every contribution must be measured in the same unit. We may elect to measure value in terms of dollars, which is very convenient, because it is comparable across customers. So for a group of customers each of them will assign a different utility to the various value drivers and each of them also will have their own exchange rate of utility to dollars yielding a broad range of different dollar values assigned.

If we look at one single customer then we can estimate a base value as well as changes in this value based on changes in specific value drivers. The base value ties to the customer need. We can estimate the base value from what the customer is already paying for obtaining a similar utility or from the size of the savings that the product brings. It is challenging to estimate the base value far out in the future because new applications keep being discovered. It took more than a century from the invention of the telephone until somebody started using cell phones for email! Of course, the wireless infrastructure and the internet are both complementary offerings, which the inventor of the telephone, Alexander Graham Bell, did not know about.

The changes in the base value are estimated based on positive or negative effect of specific value drivers. We can estimate the negative impact on the overall value caused by an increased cost or a total lack of availability (that is the same as an infinite cost) of any of the complements. Estimating value drivers for a new product can be tricky because there is not direct historical data. However, we can assume that the impact from changes in price or availability of complements will be similar to what other markets have experienced. For

example, we can learn about software from the computer industry, and about electric power from other home appliances. In a similar fashion we can estimate the impact of value drivers relating to different product configurations or designs, e.g. existing products can reveal the value added from a sleek contemporary design or an added product feature such as being able to control it over the internet.

Some of the estimates for two different specific users of an Advanced Kitchen Center are shown in Table 2. The estimates are for the automation component, over and above a standard electric range and a standard personal computer. Although not done here, it is possible to arrive at these estimates through the use of mathematical modeling building on historical data from other fields and customer surveys.

Value drivers	Change by	Home User	Commercial User
Estimate of value delivered during first year of ownership			
Value of meals produced		\$700	\$100,000
Cost of materials and labor		(\$350)	(\$90,000)
Satisfaction of fresh meals		\$100	\$0
Uniqueness of meals		\$75	\$0
Ability to meet specific needs		\$50	\$5,000
Ability to keep inventory low		\$1	\$3,000
Value of fast delivery		\$40	\$5,000
Total expected value		\$616	\$23,000
Estimate of impact on base value though changes in selected value drivers			
Cost of Adv. Kitchen Center	+\$1.00	\$0.30	\$0.45
Cost of ingredients	+\$1.00	\$1.00	\$1.00
Branding (instead of generic)	recognized by 10% more	\$50	\$1,000
Ease of use (time saving)	10% less time	\$50	\$5,000
Customer service and support (small change over status quo)	+\$1.00 spent	\$0.75	\$1.00
Customer support during sale (small change over status quo)	+\$1.00 spent	\$1.25	\$1.00

Table 2. Estimates of value to two users, one of them being a Home User, the other being a Commercial User. We can look at these two users as being two specific people surveyed.

Value Adjusted for Risk

With a new product like the Advanced Kitchen Center most customers will be in doubt about how much value they ever will be able to harvest, and, naturally, they will be discounting the product accordingly. If we, through promotion, can educate the potential users and convince them about the benefits, then the discount will be less and the perceived value higher. A warranty or a money back guarantee can also help reduce the risk and thereby increase the risk discounted value.

For financial products it is customary to discount their value according to how risky they are. We do not have a similar well established method for discounting the value of consumer products, but again here historical data from other products can help us. For example, many computer and printer retailers sell extended warranties and from that we can estimate the premium associated with the risk of a product failure. Table 3 lists estimates for some specific risk factors.

The risk discounted present value can be estimated as $V_{\text{risk discount}} = V_{\text{risk free}}/R = S[V_t/(1+r)^t]$ where R is a risk discount factor, r is related to the probability of the user not

being satisfied, V_t is the risk free value received during the period t . In the absence of risk mitigating measures such as warranties, free upgrade subscriptions, money back guarantees and insurance the values to each of these two users will be reduced as shown in Table 4. The results shown are based on the assumptions that each year the risk is the same and there is no change in the value realized by the user. More exact models will account for changes in value and risk over time.

Risk factors		Home User	Commercial User
Discount associated with	Product failure	4%	10%
	Not being able to get service / support or ingredients in the right containers	2%	8%
	Not finding a use for product	10%	2%
	Obsolescence	5%	10%
	Not becoming a proficient user	10%	1%
	Not having time and money to use it	6%	1%
	Other risks	10%	5%
Total combined risk discount		39%	32%

Table 3. Risk discount-factors relating to potential threats within one year of ownership.

	Home User	Commercial User
Year 1	\$443	\$17,424
Year 2	\$319	\$13,200
Year 3	\$230	\$10,000
Year 4	\$165	\$7,576
Year 5	\$118	\$5,739
Total for first 5 years	\$1,275	\$53,939

Table 4. Discounted value for user of an Advanced Kitchen Center.

Market Power

If value is depicted by the size of a cake then market power describes how large a slice of that cake we possibly can get. The user will look at the value of the Advanced Kitchen Center and everything associated with it, out of which the core product is only a small portion. It is legitimate to charge for value that others create, including value created by the customer. However, in order to do so we must have adequate market power. It is easier to create value than to charge for it. Many internet companies were excellent at creating value, but failed when it came to turning this value into profits through skillful value appropriation.

There are two aspects of market power. The market power relative to the customer determines how much of the value to the consumer actually can be charged as a selling price. The market power among the suppliers of complementary products (hardware, software, ingredients, power, and so on) determines how much each of them can charge. In terms of the Advanced Kitchen Center, the customer has relatively little power because there is almost no direct competition and initially there will be a limited supply of Advanced Kitchen Centers. Both factors leave the supplier in a strong position, and in a position to only serve the clients that value the Advanced Kitchen Center the most. On the other hand there is plenty of indirect competition from suppliers of ready-made meals, home-helpers, cook by yourself people and restaurants – all contributing to a reduction in market power.

In case of the relative power between the Advanced Kitchen Center supplier and the suppliers of complementary products, then it will depend, to a large degree, on the competitive structure of each of their markets. Many authors in the business strategy area have focused on studying this aspect. Table 5 shows some ad-hoc estimates of the relative market power of some of the key players. Better estimated can be obtained from analyzing market structures, the relative profitability of various existing industries, etc.

	Home User	Commercial User
Customer in part as a result of indirect competition	0.05	0.20
Advanced Kitchen Center supplier	0.70	0.28
Range supplier	0.13	0.15
Ingredient supplier	0.03	0.25
Electric power	0.02	0.02
Education and publishing	0.02	0.02
Other (not listed above)	0.05	0.08

Table 5. Relative market power estimates.

It is seen that the Advanced Kitchen Center supplier is in a fairly strong position. Many “conventional” businesses are used to think of the market price as “cost plus”, however, that assumes that there is a strong competition and that the suppliers are willing to quit doing business if they cannot get their “plus” above cost. That type of market weakness holds for some of the suppliers of complementary products.

Price Ceiling

According to these estimates the highest prices that can be charged to the two customers considered so far are \$873 (0.7 times \$1,247 that is relative market power times the present 5 year risk discounted value) for the home user and \$15,102 for the commercial user (for the automation component only). That assumes that there is no risk mitigating offerings. In most cases businesses elect to charge less than what the value and power would allow them to do. For example, if the Advanced Kitchen Center is sold at a fixed list price independent of individual differences in customer value it will be impossible to capture the maximum profit.

Step 5: Seller Side and Cost Structure

We can break the cost into different categories:

1. Knowledge related cost such as product R&D, manufacturing process development, market intelligence gathering and other upfront investments that are almost the same independent of the subsequent production volume. For most high volume products there are large potential benefits from using fixed initial cost to reduce subsequent variable cost.
2. Cost of scarce resource related to raw materials and labor; these are mostly variable in nature.
3. Customer specific cost. An Advanced Kitchen Center is a software intensive product and we might expect that as much as a third to half of the total price will go towards customer support. However, some customers need a lot more help than others and some customers will even cost more in customer support than they paid for the product initially. As long

as it is possible to separate the customer specific cost, doing so opens the possibility of identifying where the profit really is generated. The cost broken down into these three groups for the home user and the commercial user are shown in Table 6.

	Home User	Commercial User
Fixed cost (for all units)	\$500M	\$50M
Variable cost (per unit)	\$113	\$652
Customer specific cost (per unit)	\$217	\$357

Table 6. Estimated cost structure for the Advanced Kitchen Center.

Step 6: Optimize Profit

The profit is the difference between the selling price (step 4) and the cost (step 5), if we assume that there is no difference in time between the various positive and negative cash flows:

$$\text{Profit} = \text{Price} - \text{Cost}$$

Where the price conceptually is related to the risk discounted value multiplied with the fraction of market power the seller has (Figure 3):

$$\text{Price} = \text{Market Power} * (\text{Value} / \text{Risk}) * \text{Pricing Decision Factor}$$

While the part (Market Power * Value / Risk) reflects the theoretical highest market price achievable, the Pricing Decision Factor is a measure for how much below that price the seller is actually selling the product. A company with a fixed list price will normally always have some customers to whom they sell with a Pricing Decision Factor less than one.

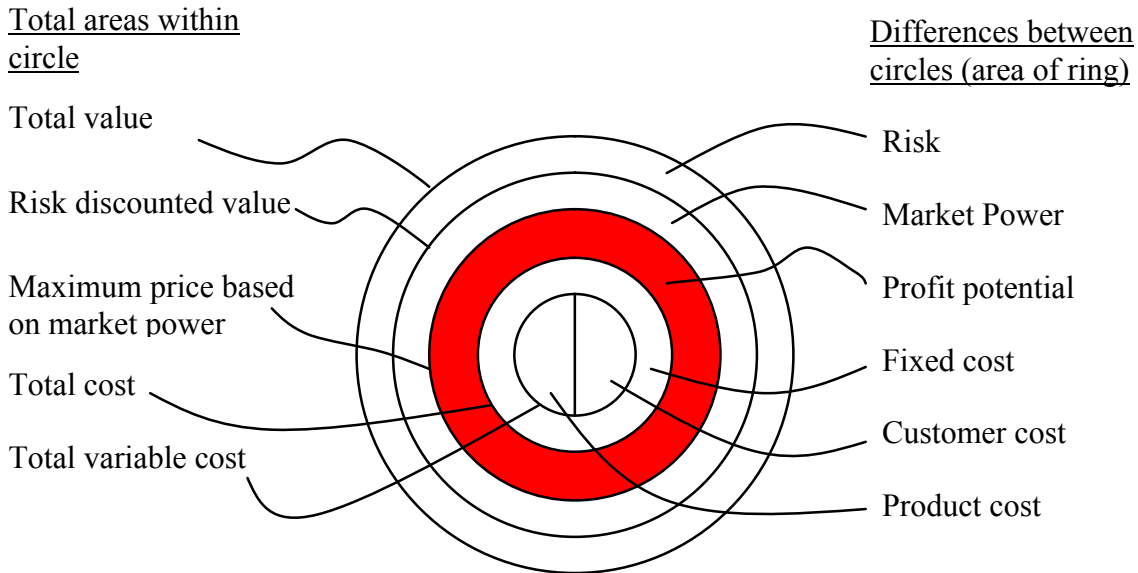


Figure 3. Figure illustrating how different aspects of the method relate to the profit. The pricing decision factor is not included.

So far it has all been about understanding one user and one base configuration of the value net. Getting to the bottom line requires that we look at the entire market and all the possibilities. Every aspect of this evaluation will change as the volume goes up:

- A large market will include customers, who do not necessarily have that much of a need for the product, making the average value go down. On the other hand a larger market will increase the number of complements offered thereby increasing the value.
- When the market is small it is often limited to the users with the lowest risk exposure, such as the ones who know for sure that this is what they want or who can afford a mistake. As the audience broadens more of the people with less clearly defined ideas of uses and values of the product appear.
- The market power to the supplier goes up as the market grows. Any single customer becomes less important and the other suppliers will become more dependent on this product. At any given power level it is good to check that the other key suppliers have enough of an opportunity to be willing to participate in delivering a solution to the customer. For example, is there enough of a profit opportunity for a publisher to be willing to publish a teach yourself guide?
- The fixed cost is not quite fixed as higher volumes will require more investments in terms of manufacturing facilities and automation, but the overall fixed cost per unit goes down as the market grows up. At higher volumes the variable cost also goes down, as manufacturing gets more efficient. The customer specific cost is sometimes going up per unit at higher volumes, because the late adopters are generally less skilled and need more support.

While the previous tables have been for two individual users, Table 7 and Figure 4 show the profit estimate as a function of volume. At this point the sensitivity to changes in each of the basic parameters (Table 2) can be evaluated. It is also possible to evaluate how changes in any of the value drivers will affect the bottom line. By looking at the changes in profit with volume we can estimate the optimal volume – price combination (Figure 4). Key financial parameters, and the additional assumptions they are based on are summarized in Table 8. Even better financial results can be obtained if we take additional steps to increase value, reduce risk, increase market power and reduce cost.

Volume per year (units)	10	100	1k	10k	100k	1M	10M
Total expected value per year (the lowest for any user at this volume)	\$500k	\$50k	\$10k	\$2.5k	\$1k	\$500	\$300
Risk discount	10%	15%	20%	25%	30%	43%	65%
Discounted value over 5 years	\$1.9M	\$167k	\$30k	\$6.7k	\$2435	\$968	\$424
Market power to Advanced Kitchen Center supplier	0.46	0.53	0.59	0.64	0.68	0.71	0.73
Variable cost (average per unit)	\$2k	\$1k	\$500	\$250	\$150	\$100	\$75
Customer specific cost (average per unit)	\$350	\$150	\$150	\$175	\$200	\$225	\$250
Profit if there is one price and it is set as high as possible, no fixed cost	\$9M	\$9M	\$17M	\$39M	\$131M	\$362M	(\$156M)

Table 7. Key parameters at different volumes for the home version of the Advanced Kitchen Center. The previous tables correspond to the 50,000 unit level. Fixed cost is not considered in this table.

Based on the results summarized in Table 8, it seems that the Home User version might be a reasonable investment opportunity while the Commercial unit is less attractive on its own. However, if the initial investment in developing the commercial unit can be reduced significantly through utilization of core technology developed for the Home Unit, then it might be a very viable second product line. Numbers are here to support business decisions, not

dictate them, so these results are more a set of guidelines than “must-do” items. For example, Table 8 assumes that a market skimming pricing strategy is used, with the price-volume pairs listed. However, if there is a threat of a competitor entering the market we might consider a different pricing strategy. The method can be used to run what-if calculations showing what the financial applications of a penetration pricing or rival-detering pricing strategy would be. At this point the three initial questions: (1) go/no-go? (2) home or commercial? and (3) pricing? have been addressed. However, that assumes that the world is static, and we know that it is not. So how can we improve the strategy to enhance the chances of a success?

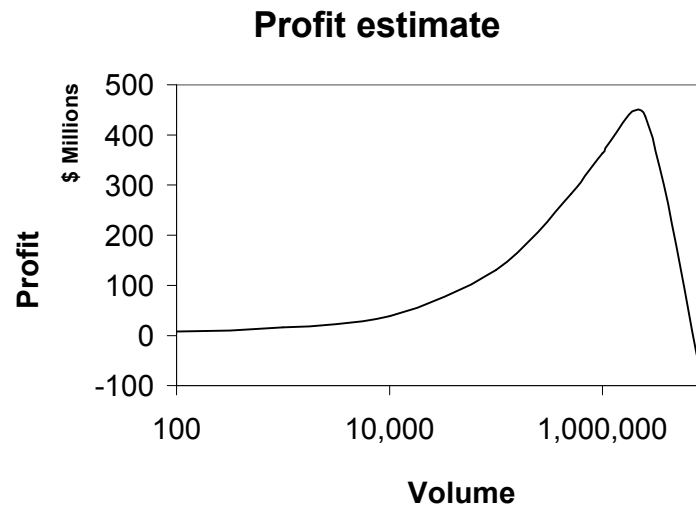


Figure 4. Estimated profit originating from the home market of the Advanced Kitchen Center based on the specific set of assumptions and data discussed (Table 7).

	Home User market	Commercial User market
Initial investment (year 0) to cover fixed cost	\$500 million	\$50 million
Expected growth in sales year 1 through 4 and price in parenthesis	10k (\$4300), 100k (\$1650), 500k (\$894), 1 million (\$694)	100 (\$59,400), 500 (\$15,100), 1000 (\$9,770), 10k (\$2,600)
Optimal volume in units and unite price, both assumed to be constant for year 5 - 10	2,533,000 (\$496)	22,289 (\$1,801)
Internal rate of return	42%	21%

Table 8. Financial summary. This table is based on the assumption that from the manufactures perspective the product has a 10 year life, and that sales drop to zero after that, as new technology will take over. It is assumed that a market skimming pricing strategy is selected.

Step 7: Create a Dynamic Business Strategy

Below follows some measures we can take to increase the chance of success, even if the market evolves in an unexpected way or if we were wrong in the initial estimates presented above:

Step 2: Value Net

- A threat is that technology growing out of other areas will make the product obsolete prematurely. Alliances with companies in some of these fields that potentially might enter the competitive space can help us being in a position to quickly respond to challenges, if they arise.
- Having more than one market segment or application for the product makes the business less vulnerable, so pursuing the home, the commercial markets, and possibly other markets in parallel might reduce risk of failure.

Step 3: Value Drivers

- It might at this point be hard to know how the customers actually will use the technology and what specific value drivers become important. Time will tell, but the product must be designed in a way so that we can go one way or another once the trends of usage become more evident. One approach is to utilize a modular design, both in hardware and software, where the modules can be reshuffled as needed, and if we were wrong initially, only some of the modules need to be redesigned, rather than the entire system.

Step 4a: Value

- Building external user support communities and alliances with co-suppliers (e.g. of ingredients) can help customers who might have difficulties finding the value in the product.

Step 4b: Risk

- Money back guarantees and warranties can reduce the risk to the customer.
- Alliances with suppliers of complementary products can reduce the risk of them being discontinued, threatening the value to the user.

Step 4c: Market Power

- Alliances with user groups can create “locked-in” customers giving power.
- Establishing, and controlling a standard for the containers that are used will give market power.
- An early dominance in the value net might create more market power in the long run.

Step 5: Cost

- Agreements and alliances with contractors, suppliers, employees and other “upstream” nodes can help maintain cost in line. Having multiple sources of supply can help maintain market power vis-à-vis the suppliers and avoid interruption in case one supplier goes out of business.

Step 6: Optimization

- Price, volume and strategy must all be adjusted in response to changes in the market, so regular revisions will be needed.
- We need to plant the seed now for the next generation of revolutionary technology. It is better that we make our own technology obsolete than letting the competition do so.

Conclusions

For the sake of clarity the present paper provides an abridged conceptual overview and uses a simple hypothetical example as an illustration. The reality is always more complex, however, it is often possible to relate even the most complex business questions back to the simple framework presented in this paper. While quantification often is desirable, it may not always be feasible. Fortunately quantification is often not necessary; the conceptual framework in it self is a powerful way of evaluating and ranking strategic choices from a financial perspective.

Selected Further Reading

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