

Spreadsheet Analyses for Marketing and Product Management

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Abstract: This paper briefly summarizes seven areas where analytics can help make better decisions in marketing and product management. A brief case study is provided for each application area. The application areas are self-contained, so you can read just one or two that interest you. Most of the discussions include links to complimentary spreadsheet applications that the reader can explore.

Contents

1	Introduction	2
1.1	The Analytics Revolution	2
1.2	The Roles of Analytics in Marketing	2
1.3	The Role of Spreadsheets in Marketing Analysis	3
2	Examples of Marketing Analytics	4
2.1	Strategic Evaluation of Investment Projects	4
2.2	Product Profitability	7
2.3	Marketing Program Contribution Margins	10
2.4	Sales Reporting and Analysis	13
2.5	Sales Planning/Forecasting	17
2.6	Pricing Decisions	19
2.7	Bug Tracking - For Development-Centric Product Managers	20
3	Conclusion	21

1 Introduction

1.1 The Analytics Revolution

The growth of quantitative analysis has been the second-biggest revolution in management in the past two decades. Of course, the biggest revolution in marketing has been introduction of the internet.

As companies grow, the skills required of senior managers change. At some point, senior managers can no longer afford to develop first-hand knowledge of details throughout the business. Two new organizational skills become crucial to success.

- 1) Delegation. Senior managers must gather information through peers and subordinates, and they must execute through peers and subordinates. A senior manager can no longer succeed by being a bigger version of a first-line manager.
- 2) Use of indirect information: Quantitative analysis and inputs from peers and subordinates replace much of the first-hand knowledge of segment details that senior managers rely on to run smaller companies.

This paper focuses on the second key skill – using indirect information to help run a business, with an emphasis on data-backed information in marketing and product management.

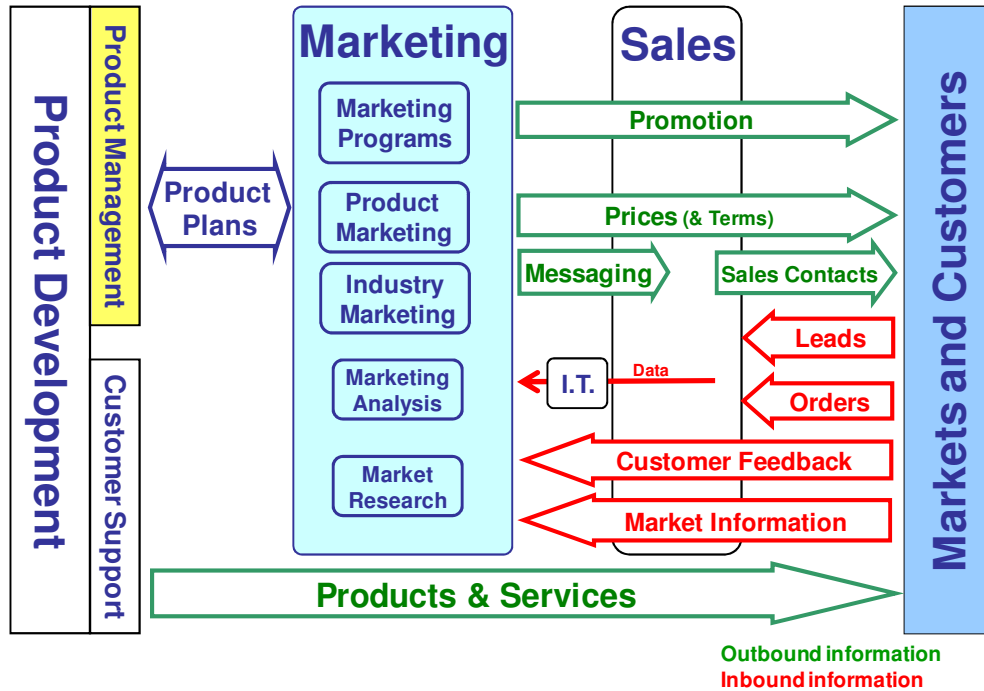
Designing and using quantitative information wisely is an art in itself.

- Managers who use quantitative information must balance it with conceptual inputs and subjective opinions. For example, in evaluating a proposed investment project, a manager must balance strategic concepts like “market attractiveness” and “competitive strength” (the focus of our first example in this paper) with product profitability metrics (the focus of our second example), and subjective opinions of trusted peers and subordinates.
- Designers and users of quantitative information must know what approximations to accept and how they limit the credibility of the resulting metrics. For example, marketing program contribution margins (the focus of our third example) are computed using some pretty heroic assumptions – which marketing touches are connected to purchase decisions inside a customer organization, the relative impact of different kinds of marketing touches (e.g. live seminars, sales visits, web visits), the relative weight of marketing touches that generate interest and those that help close an order, the rate at which a marketing touch loses its effectiveness over time. These assumptions don’t have to be right in every case to yield very useful decision metrics, especially when quantitative information is combined with first-hand field knowledge.

1.2 The Roles of Analytics in Marketing

Marketing manages information that helps well-targeted products to satisfy customers and generate orders. Many kinds of information are needed, and an increasing share of this information is backed by hard data.

Figure 1: Information is the Life Blood of a Business; Marketing is a Key Crossroads of Information



This paper discusses six kinds of analytics that are useful in marketing management, plus one kind that is useful for product managers who are closer to product development than to marketing. For each type of analysis, we begin with a real situation where the analytics contributed to improved performance.

1.3 The Role of Spreadsheets in Marketing Analysis

Spreadsheets led the “desktop revolution” that freed business experts to experiment and self-serve with less dependence on IT professionals. These are still the main advantages of spreadsheets.

TDWI published an excellent summary of the use of spreadsheets in enterprises in *Strategies for Managing Spreadmarts: Migrating to a Managed BI Environment*.¹ Eckerson and Sherman defined a “spreadmart” as

a reporting or analysis system running on a desktop database (e.g., spreadsheet, Access database, or dashboard) that is created and maintained by an individual or group that performs all the tasks normally done by a data mart or data warehouse, such as extracting, transforming, and formatting data as well as defining metrics, submitting queries, and formatting and publishing reports to others.

The report provides a balanced summary the benefits and problems of spreadmarts.

A *customizable* template is a flexible spreadsheet model that you can adapt to your situation by filling in a simple form, without editing a spreadsheet or its formulas. For example, you can specify time range and time grain; number and names of items in a dimension (such as your products and product families); and include or exclude major features. You get a customized template that matches your needs better than any standard template can. In small to medium-sized companies, customized spreadsheet applications, and the necessary input data, may be all that you need to get valuable results.

¹ Wayne W. Eckerson and Richard P. Sherman, *Strategies for Managing SpreadMarts: Migrating to a Managed BI Environment*, First Quarter 2008 TDWI Best Practices Report, January 2008. URL: <http://www.tdwi.org/research/display.aspx?ID=8874>.

2 Examples of Marketing Analytics

2.1 Strategic Evaluation of Investment Projects

2.1.1 Case situation

A company with many business units generated about a dozen internal investment proposals per year. The company evaluated projects on a matrix of old/new products × old/new customers, and the company favored serving new customers with new products. This framework is appropriate for evaluating innovation risk, but not for making investment decisions. Many project champions, especially technical champions, felt they did not know how to communicate the opportunities to management, and they perceived the decision process as idiosyncratic. The company had a backlog of unevaluated project candidates.

2.1.2 Challenge

The primary objective is to allocate resources among a dozen candidate projects each year. Conditions vary widely across business segments – high/medium/low market growth rates, strong/weak company participation, varying internal expertise in technologies and markets.

The second challenge is to build consensus behind a planning framework based on proven approaches to strategic management. The company needed a conceptual framework in which marketing and technical professionals and executives could communicate.

The third challenge is to develop tools that helped to evaluate and present each project with the minimum of staff preparation.

2.1.3 Solution

First introduce proven strategic criteria for evaluating projects. The two keys concepts are:

- market attractiveness. Market growth is often the best simply proxy.²
- relative competitive strength, for which relative market share is usually a good proxy.³

Secondly, score each project on the key criteria. Market attractiveness is mostly determined by market growth, competitive intensity, and appropriate market size. Competitive position depends on relative market share, and relevant strengths in products, technologies, distribution and support.

Thirdly, estimate the costs, payoffs and risks of each project. The key payoff is 5-year revenue estimates. Costs include initial and ongoing development costs.

Lastly, assemble all the candidate projects in a portfolio view that shows which ones are addressing favorable market situations, and which ones utilize key competitive advantages of the company.

² Market attractiveness compresses many factors into a single measure.

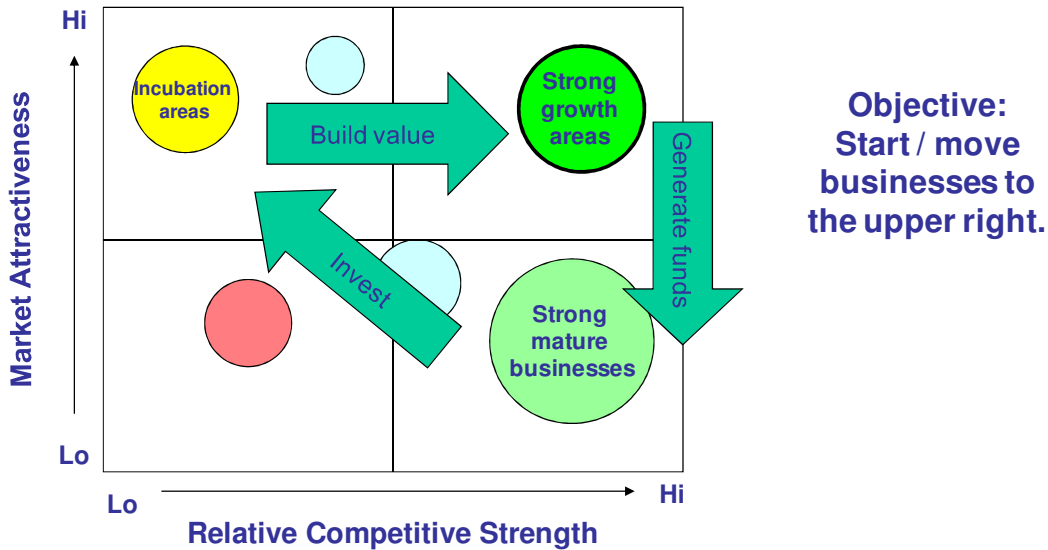
- Market growth rate is the best simple measure of market attractiveness.
- Other factors can include: market concentration of suppliers and of customers, threat of forward / backward integration by suppliers / customers, availability of substitute products at low cost, entry and exit barriers.
- Some factors have different impact on market attractiveness for different competitors: scale economies, forces of differentiation and standardization, Importance of technology and other functional strengths, brand switching costs for customers.

³ Relative competitive strength also compresses many factors.

- Relative market share is usually the best simple proxy.
- Other influencers can include scale economies, standards, technology, defensible segment position, brand recognition, channel dominance, product line synergy, and organizational characteristics.

Figure 2: Key to strategy is to match external opportunities with internal capabilities

Portfolio Matrix depicts match of strengths and opportunities



The strategic planning manager worked with each project team on how to evaluate their project and communicate it. Each project evaluation was captured in a 1-3 page scorecard that included a lot of textual comments along with the scores. The strategic analysis was combined with opinions of experienced experts in reaching decisions.

Figure 3: Strategic Scoring of Investment Project (“sanitized” example)

Date: 1/9/2009

Business Area: Sample Candidate Investment Project

	Normed Weight		Before Investment		After Investment	
			Rating (0-10)	Weighted Score	Rating (0-10)	Weighted Score
Market Factors - Importance	100.0%	Market Factors - Ratings	7.7		7.8	
Market Growth & Size	60.0%	Market Attractiveness	8.6	5.1	8.7	5.2
Competitive Intensity	40.0%		6.4	2.6	6.4	2.6
Company Strength Factors - Importance		Company Strength Factors - Company Ratings	4.2		6.7	
Markets and Strategic Factors	29.4%	Competitive Strength	3.8	1.1	5.9	1.7
Products and Technologies	47.1%		4.3	2.0	7.4	3.5
Marketing, Sales and Support	23.5%		4.4	1.0	6.3	1.5
Opportunity Size						
Market size this year (\$ million)	\$10	SWAG	ABC Corp' N&M Revenue this year (\$ million)		\$0.0	
Market size, five years from now (\$ million)	\$40	32%	ABC Corp' Revenue 5 years from now (\$ million)		\$10	
Includes only SW.			Wild but conservative guess			
Market Definition						
Applications	Text xxxx		Qualitative comments			
Industry	Text xxxx					
Products	Text xxxx					
Technologies	Text xxxx					
Competiiton	Text xxxx					
Investment Required						
Text xxxx						

The top section scores the projects on a more or less common framework. The scoring system uses two key strategic concepts:

- market attractiveness. Market growth is usually the most important single factor. Competitive intensity, and appropriate market size are also included.

- relative competitive strength. Relative market share is usually the most important single factor, but not in all cases. Strengths in products, technologies, distribution, and customer support are also key factors.

The descriptive comments at the bottom are very important. Scoring systems should always allow people to say more than a numerical score can capture.

Figure 4: Detailed Scoring of Investment Project (“sanitized” example)

Date:		Business Area:		Sample Candidate Investment Project					
1/9/2009				Before Investment		After Investment			
		Normed Weight	Market Factors - Ratings		Rating (0-10)	Weighted Score	Rating (0-10)	Weighted Score	
Market Factors - Importance		100.0%				7.7		7.8	
Market Growth & Size		60.0%			8.6	5.1	8.7	5.2	
Growth (5 years)		34.3%	Growth, 5 years(5% -> 4, 10% -> 6, 20% ->	9	3.1	9	3.1		
Strategic Growth (5-15 years)		17.1%	Out-year Growth (6-15 years)	9	1.5	9	1.5		
Market size		8.6%	Mkt size (\$10M -> 6, \$100M-> 9, \$500M-> 7	6	0.5	7	0.6		
Competitive Intensity		40.0%			6.4	2.6	6.4	2.6	
Lack of competing products		17.1%	Lack of competing products	6	1.0	6	1.0	Comment xxxx	
Lack of substitute products		11.4%	Lack of substitute products	7	0.8	7	0.8	Comment xxxx	
Customer fragmentation		5.7%	Customer fragmentation	4	0.2	4	0.2		
Customer affluence		5.7%	Customer affluence	9	0.5	9	0.5		
Bargaining power with suppliers		0.0%	Bargaining power with suppliers	5	0.0	5	0.0		
Company Strength Factors - Importance			Company Strength Factors - Company Ratings		4.2		6.7		Benchmark corr
Markets and Strategic Factors		29.4%			3.8	1.1	5.9	1.7	
Competitive concentration		9.6%	Relative market share (1.0 -> 5, 2.0 -> 8)	2	0.2	5	0.5	2 years after lau	
scale economies		4.8%	Cost position	7	0.3	7	0.3		
standards		2.4%	Position on standards	6	0.1	6	0.1		
differentiation		4.8%	Differentiating factors	4	0.2	8	0.4	Comment xxxx	
Brand switching costs		2.4%	Customer base to defend	2	0.0	5	0.1		
Market readiness / timing		2.4%	Appropriate time to market	6	0.1	6	0.1		
Ease of market development		1.4%	Market development resources	5	0.0	6	0.1		
Certification / regulation		1.0%	Relative position on cert. / reg.	5	0.0	5	0.0		
High entry barriers		0.5%	Entry costs paid	2	0.0	4	0.1		
Products and Technologies		47.1%			4.3	2.0	7.4	3.5	Raised -- embry
Product line synergy in market		2.3%	Product line synergy in market	4	0.1	8	0.2		
XXXXXXXX (technology)		7.6%	XXXXXXXX (technology)	10	0.8	10	0.8	Comment xxxx	
Block diagram editor		7.6%	Block diagram editor	3	0.2	8	0.6	Comment xxxx	
XXXXXXXX (technology)		3.8%	XXXXXXXX (technology)	6	0.2	8	0.3	Comment xxxx	
XXXXXXXX (technology)		3.0%	XXXXXXXX (technology)	2	0.1	8	0.2	Comment xxxx	
XXXXXXXX (technology)		3.8%	XXXXXXXX (technology)	2	0.1	6	0.2	Comment xxxx	
XXXXXXXX (technology)		3.8%	XXXXXXXX (technology)	6	0.2	7	0.3	Comment xxxx	
Domain expertise		3.8%	Domain expertise	2	0.1	4	0.2		
XXXXXXXX (technology)		3.0%	XXXXXXXX (technology)	2	0.1	7	0.2	Comment xxxx	
XXXXXXXX (technology)		2.3%	XXXXXXXX (technology)	2	0.0	6	0.1	Comment xxxx	
Large models - performance		3.8%	Large models - performance	4	0.2	7	0.3	Comment xxxx	
Large models - storage		2.3%	Large models - storage	1	0.0	6	0.1	Comment xxxx	
Marketing, Sales and Support		23.5%			4.4	1.0	6.3	1.5	Comment xxxx
Brand recognition		3.9%	Relative brand recognition	6	0.2	8	0.3		
Customer relationships		4.9%	Customer relationships	4	0.2	6	0.3		
Distribution - industry coverage		3.9%	Relative industry coverage	4	0.2	7	0.3		
Distribution - geographic coverage		2.9%	Relative geographic coverage	7	0.2	7	0.2		
Distribution - domain expertise / sales model		3.9%	Distribution - domain expertise / sales mode	4	0.2	5	0.2		
Customer support requirements		3.9%	Applicable support resources	2	0.1	5	0.2	Comment xxxx	

This view is too compressed to read. The key points are that (1) many factors are considered in scoring a project; and (2) there is room for qualitative comments that contain more information than numerical scores.

2.1.4 Case outcome

A new strategic framework was used to evaluate each project for its impact on the business unit to which it belonged.

The backlog of projects was emptied, and many projects were funded based on a solid analysis of their business position. One result was that the company entered and quickly came to dominate the biology simulation market, despite being late in more established parts of computational biology. The strong entry in computational biology was probably the most important success because this market promises to be a very large high-growth market for decades to come.

The response of the project champions was very enthusiastic. They learned a lot about how to evaluate business opportunities, and how to communicate with management. Managers whose projects were not funded knew the reasons, which made it easier to accept the decisions.

The reaction from management was mostly very positive. However, one VP declared that strategic planning was useless to him - he would throw a small team at most ideas, and put larger teams behind the products that sold well. (As a result, the company was about five years late in investing heavily in the largest opportunity in its industry, which was managed by the VP who used this approach.)

2.2 Product Profitability

2.2.1 Case situation

A company with many products had to allocate resources (most importantly product development headcount) to existing products. As the company grew, top management no longer knew all the products well enough to “guesstimate” product profitability. Product managers in marketing and development sometimes felt that resource decisions were subjective or determined by communications skills instead of business substance, and they often did not buy in to decisions to deny their headcount requests.

2.2.2 Challenge

The first challenge was to assemble the input data and to compute product contribution margins.

The second challenge was to coach management on how to use product profitability information in decision-making while balancing it with strategic factors and opinions of experienced experts. The importance of profitability in making investment decisions depends on the strategic situation.

The third challenge was to use the analysis to identify goals for product teams that significantly improved customer satisfaction and financial results.

2.2.3 Solution

The marketing, development and finance departments collaborated to produce product contribution margins. The key elements of cost were product development staff, dedicated marketing staff, and customer support staff.

2.2.4 Case outcome

The company introduced product contribution margins into the resource planning process. The analysis revealed some surprises. The biggest surprise was that all software products that interfaced with hardware (e.g. boards) or operating systems had low margins because of the cost of customer support services.

Management learned when to make headcount decisions based on profitability, and when strategic considerations overrode profitability (for example, a product with very high growth rate would probably be forgiven for losing money).

The analysis was used extensively in semi-annual headcount allocation meetings. If management denied requests for resources for an existing product, the project champions knew why, and they knew what to do about it – either raise the contribution margin, or articulate a strategic rationale for the added resources that trumped the profitability metric. These factors improved the acceptance and perceived legitimacy of numerous resource decisions.

Management made good use of the support cost information outside of the resource planning meetings. If product contribution margin was low, and support cost was driven by installation problems, then the development team was assigned the goal of improving installation. If customers did not understand some product features, the designers and documentation writers were assigned the goal of reducing customer difficulties with these features.

2.2.5 Spreadsheet application

Spreadsheet applications can analyze product profitability for a product line of several hundred products. The ModelSheet application “Product Profitability” computes contribution margins for a line of products by deducting cost of sales and allocated expenses in three departments from product revenues.

a) Cost of sales

- Cost of goods. You can specify cost of goods as a combination of cost per unit, percentage of revenue, and fixed period cost. Cost of goods is segmented by manpower costs, program costs and overhead costs.

- Royalty expense. You can specify royalties as a combination of cost per unit, percentage of revenue, and fixed period expense.
- b) Operating expense
- Engineering expense. You can specify engineering expense in terms of equivalent staff headcount, programs expense, and overhead.
 - Directly attributable marketing expense. You can specify marketing expense in terms of equivalent staff headcount, programs expense, and overhead.
 - Customer support expense. Customer support is often the most complicated area in which to allocate expense to products. The model includes a distribution of support call times. It also allows you to track support expense by support issue (such as installation, maintenance, applications assistance).

In each department, you can specify hours and manpower costs for several job levels.

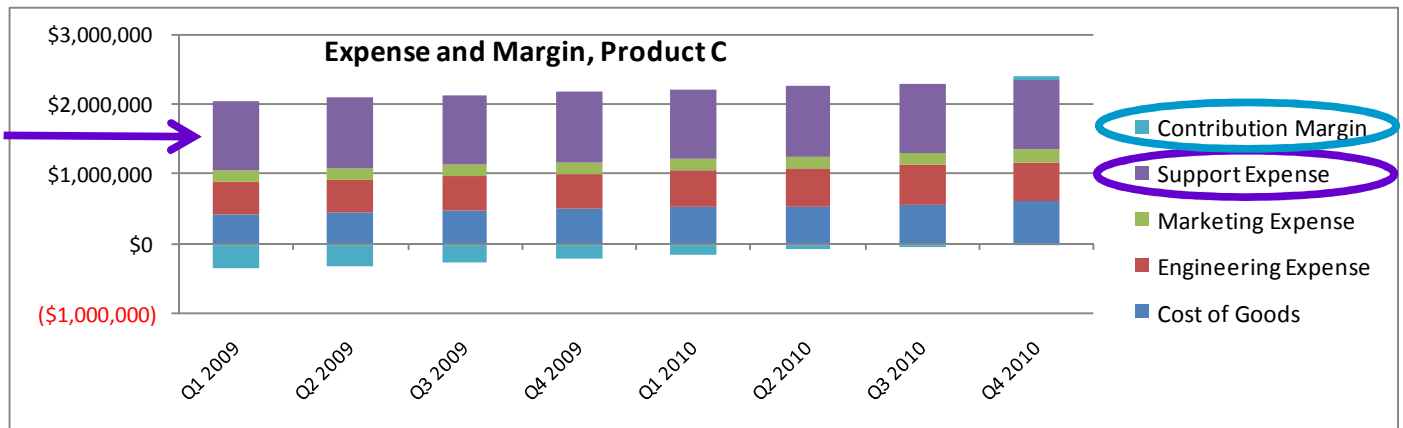
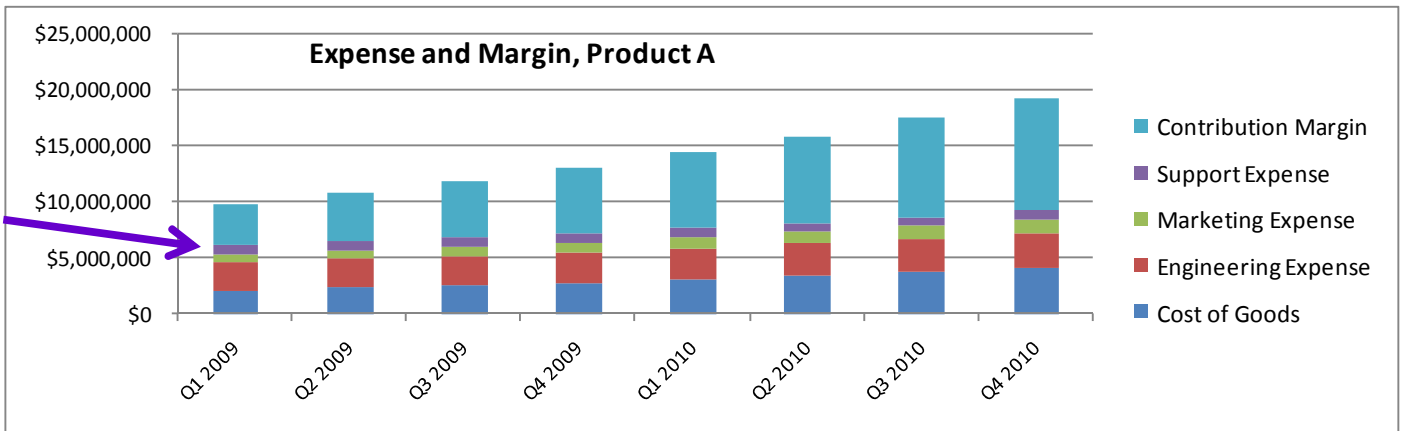
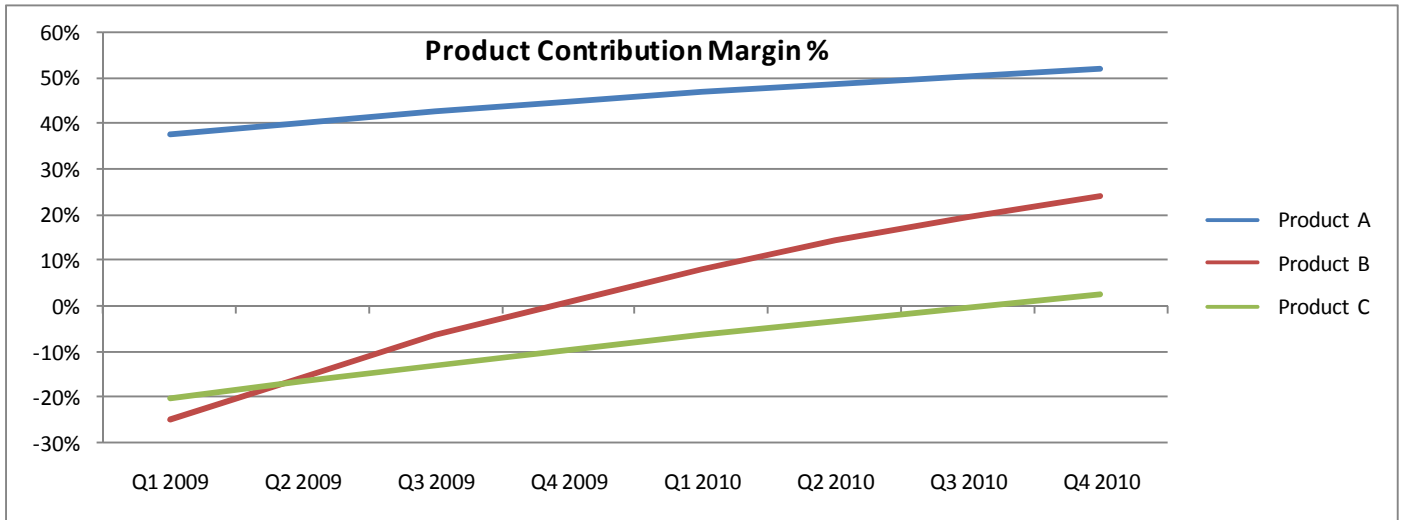
Visitors can customize and download complimentary working spreadsheets for product profitability analysis at <http://templates.modelsheetsoft.com/modelsheettemplates/product-profitability-templates.aspx>.

Figure 5: Sample Output of Product Contribution Margin Analysis (See charts below for overview.)

	Q1 2009	Q2 2009	Q3 2009	Q4 2009	Q1 2010	Q2 2010	Q3 2010	Q4 2010
Revenue								
Product A	\$9,880,000	\$10,868,000	\$11,954,800	\$13,149,900	\$14,464,700	\$15,910,600	\$17,500,900	\$19,250,800
Product B	\$4,271,000	\$4,912,000	\$5,649,000	\$6,496,000	\$7,470,000	\$8,591,000	\$9,880,000	\$11,362,000
Product C	\$1,725,000	\$1,812,000	\$1,902,000	\$1,996,500	\$2,097,000	\$2,202,000	\$2,311,500	\$2,427,000
Total	\$15,876,000	\$17,592,000	\$19,505,800	\$21,642,400	\$24,031,700	\$26,703,600	\$29,692,400	\$33,039,800
Cost of Goods								
Product A	\$2,121,600	\$2,333,760	\$2,567,136	\$2,823,768	\$3,106,104	\$3,416,592	\$3,758,088	\$4,133,856
Product B	\$1,624,048	\$1,867,788	\$2,148,032	\$2,470,104	\$2,840,468	\$3,266,728	\$3,756,870	\$4,320,401
Product C	\$437,000	\$459,040	\$481,840	\$505,780	\$531,240	\$557,840	\$585,580	\$614,840
Total	\$4,182,648	\$4,660,588	\$5,197,008	\$5,799,652	\$6,477,812	\$7,241,160	\$8,100,538	\$9,069,097
Gross Margin								
Product A	\$7,758,400	\$8,534,240	\$9,387,664	\$10,326,132	\$11,358,596	\$12,494,008	\$13,742,812	\$15,116,944
Product B	\$2,646,952	\$3,044,212	\$3,500,968	\$4,025,896	\$4,629,533	\$5,324,272	\$6,123,130	\$7,041,600
Product C	\$1,288,000	\$1,352,960	\$1,420,160	\$1,490,720	\$1,565,760	\$1,644,160	\$1,725,920	\$1,812,160
Total	\$11,693,352	\$12,931,412	\$14,308,792	\$15,842,748	\$17,553,889	\$19,462,440	\$21,591,862	\$23,970,704
Gross Margin %								
Product A	79%	79%	79%	79%	79%	79%	79%	79%
Product B	62%	62%	62%	62%	62%	62%	62%	62%
Product C	75%	75%	75%	75%	75%	75%	75%	75%
Total	72%	72%	72%	72%	72%	72%	72%	72%
Engineering Expense								
Product A	\$2,510,750	\$2,581,153	\$2,653,667	\$2,728,357	\$2,805,288	\$2,884,526	\$2,966,142	\$3,050,206
Product B	\$1,326,750	\$1,363,973	\$1,402,312	\$1,441,801	\$1,482,475	\$1,524,369	\$1,567,520	\$1,611,966
Product C	\$471,000	\$484,230	\$497,857	\$511,893	\$526,349	\$541,240	\$556,577	\$572,374
Total	\$4,308,500	\$4,429,355	\$4,553,836	\$4,682,051	\$4,814,112	\$4,950,136	\$5,090,240	\$5,234,547
Marketing Expense								
Product A	\$684,000	\$741,900	\$805,328	\$874,808	\$950,971	\$1,034,446	\$1,125,969	\$1,226,379
Product B	\$2,030,000	\$2,088,800	\$2,112,540	\$2,173,893	\$2,198,404	\$2,222,825	\$2,287,728	\$2,354,533
Product C	\$161,000	\$162,750	\$164,544	\$166,382	\$168,267	\$170,199	\$172,179	\$174,208
Total	\$2,875,000	\$2,993,450	\$3,082,411	\$3,215,083	\$3,317,641	\$3,427,470	\$3,585,876	\$3,755,120
Support Expense								
Product A	829,847	829,847	829,847	829,847	829,847	829,847	829,847	829,847
Product B	347,570	347,570	347,570	347,570	347,570	347,570	347,570	347,570
Product C	1,002,583	1,002,583	1,002,583	1,002,583	1,002,583	1,002,583	1,002,583	1,002,583
Total	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000	2,180,000
Contribution Margin								
Product A	\$3,733,803	\$4,381,340	\$5,098,822	\$5,893,120	\$6,772,490	\$7,745,188	\$8,820,853	\$10,010,511
Product B	(\$1,057,367)	(\$756,130)	(\$361,453)	\$62,632	\$601,084	\$1,229,509	\$1,920,312	\$2,727,531
Product C	(\$346,583)	(\$296,603)	(\$244,824)	(\$190,138)	(\$131,440)	(\$69,862)	(\$5,419)	\$62,994
Total	\$2,329,852	\$3,328,607	\$4,492,545	\$5,765,614	\$7,242,135	\$8,904,835	\$10,735,747	\$12,801,037
Contribution Margin %								
Product A	38%	40%	43%	45%	47%	49%	50%	52%
Product B	-25%	-15%	-6%	1%	8%	14%	19%	24%
Product C	-20%	-16%	-13%	-10%	-6%	-3%	0%	3%
Total	15%	19%	23%	27%	30%	33%	36%	39%

Product C has a very low contribution margin %, in spite of a healthy gross margin %, because its support costs are too high. Also, Product B started with a low contribution margin % and recovered, because its expenses stayed relatively constant as its revenues more than doubled.

Figure 6: Impact of Support Expense on Profitability of Product C



2.3 Marketing Program Contribution Margins

2.3.1 Case situation

During an economic downturn a few years ago, a software company was falling behind its sales plan. The vice president of sales demanded more marketing program spending from the president. The VP recounted his experience at a major PC vendor, where increases in marketing program spending were invariably followed by increases in sales within a few weeks. The president declined to increase program spending because he had little idea which programs were effective or how long they took to affect sales. The company had lead generation numbers without order conversion rates, and revenue generation estimates that credited all marketing programs combined with less than 1% of revenue.

2.3.2 Challenge

You may have heard the old saw, “Only half of our marketing spending is effective; I just don’t know which half.” The fact is that many companies can’t adequately measure the effectiveness of marketing programs.

The first challenge is to define ‘success’ for marketing programs. Does it mean lead generation, revenue generation, or subjective opinions of participants and marketing experts?

The second challenge is to identify high and low-performing marketing programs.

The third challenge is to quantify how good a marketing program is. Common revenue-generation metrics are often misleading: how should you allocate credit among the marketing programs that touched a customer? Lead generation metrics are often misleading, because lead-to-order conversion rates vary, and average order sizes vary across segments.

2.3.3 Solution

The key step is to allocate revenue to marketing programs in a way that approximates the influence of each program in the purchase decision process. The model takes into account all the programs that touched each customer before he placed each order, the types of programs (for example, a live seminar program is assumed to have more influence than a direct mail response), and the length of the time lag between the program event and the order. You can also add other factors: the chronological order in which programs touched the customer, and interaction effects between marketing programs.

Revenue generation metrics are helpful for evaluating programs, but they are not adequate by themselves. You must take into account the cost of the programs. Assembling accurate cost data for programs requires some care, but it is a fairly straightforward process.

The model goes to great lengths to match revenue to expense. The critical step is to compute “accrued expenses” for use in the analysis in place of actual spending.

- The model treats each marketing program in each time period as a depreciable asset, using the same methods used for depreciating physical assets. Just as your accrued expense for manufacturing equipment is the depreciation in each time period (and not the cash spending for new equipment), your true economic cost of marketing programs is the accrued program expense in each time period.
- If a marketing program has remaining life at the end of model time (the time range over which revenue and expense are matched), then the remaining “book value” of the program is not used in the program effectiveness analysis because we don’t have any revenue data for that part of the program’s life.
- The model allows you to include program expenditures and lead events (marketing touches of individual customers) for several time periods before the start of model time, because those expenditures helped generate sales orders during model time.

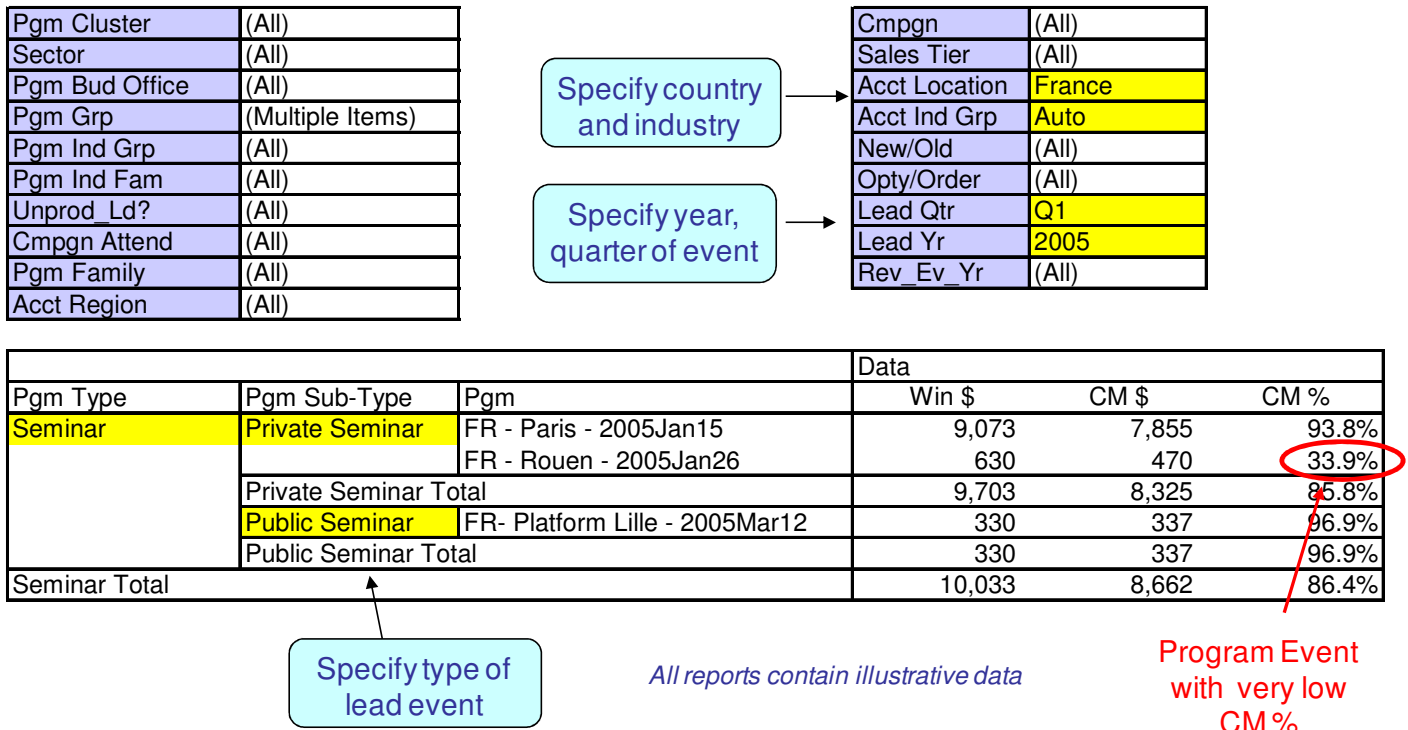
Once you can allocate revenue and expense to marketing programs, you can compute “contribution margin” as

$$\text{contribution margin} = \text{revenue} - \text{expense}$$

Program contribution margin rapidly tells you how well a program generates revenue compared to costs.

This method can estimate program effectiveness by market segment – by industry, geography, sales channel, product application area, and age of customer relationship.

Figure 7: Marketing program contribution margin \$ and %



Typical contribution margin rates are about 90%. One of the three events shown here has a contribution margin of 34%. By itself, this does not prove that the seminar was ineffective. There may be special circumstances that need to be taken into account. Only first-hand knowledge from the field can resolve questions like this.

It is best that metrics should not drive decisions in the absence of first-hand field knowledge. Here is a real example of what can go wrong.

At a trade show, a marketing manager regularly chatted with a senior executive of a very large customer, whom he could not normally access. The executive gave a virtual blanket approval for adopting the company’s product line. However, the show was weak at generating large numbers of leads, so the company cancelled the show for the next year.

2.3.4 Case outcome

A team from marketing and sales designed and implemented performance metrics for marketing programs. In two months, the team presented the first samples to marketing management – an evaluation of some live seminars. The marketing managers were excited and wanted these metrics for their programs as soon as possible.

A team from the marketing, finance and I.T. departments continued to evolve the metrics for several years. The head of marketing programs increasingly trusted the metrics to help pick out effective programs for expansion and less effective programs for closer attention. Three years later, marketing management gave a presentation at a large foreign office. They diagnosed a complex case of low sales by cross-referencing sales trends with trends in the marketing program metrics. They tracked the trends by country, product line; and customer industry, and it all fit. The local office gave the presenters an ovation for their thorough and actionable analysis of the situation.

The application above computes contribution margins for individual products by allocating engineering, marketing and support costs to products.

2.3.5 Spreadsheet application

The ModelSheet application “Marketing Programs Effectiveness” implements these methods. As the name implies, this application also includes sales programs such as sales visits and sales phone touches. Visitors can customize and download complimentary working spreadsheets for marketing programs effectiveness analysis at

<http://templates.modelsheetsoft.com/modelsheettemplates/marketing-programs-templates.aspx>.

Figure8 : Sample Output of Marketing Program Contribution Margin Analysis

**ABC Corp.
Marketing & Sales Program Margins
Contribution Margin**

	Revenue	Revenue %	Expense	Contrib Margin	Contrib Margin %
Total	\$118,200	100.0%	\$22,457	\$95,743	81.0%
Bluebirds	\$0.00	0.0%	\$0	\$0	0.0%

Marketing Programs	Mktg Revenue Alloc	Mktg Rev Alloc %	Pgm Exp Accr	Contrib Margin	Mktg Contrib Margin %
Seminar					
Intro	\$26,397	22.3%	\$3,853	\$22,544	85.4%
Intermed	\$9,972	8.4%	\$1,742	\$8,230	82.5%
Subtotal	\$36,369	30.8%	\$5,595	\$30,774	84.6%
Web Visit					
Page 1	\$10,116	8.6%	\$906	\$9,210	91.0%
Page 2	\$7,933	6.7%	\$874	\$7,059	89.0%
Subtotal	\$18,049	15.3%	\$1,779	\$16,270	90.1%
Webinar					
Intro	\$10,498	8.9%	\$866	\$9,632	91.7%
Intermed	\$13,722	11.6%	\$870	\$12,851	93.7%
Subtotal	\$24,220	20.5%	\$1,737	\$22,483	92.8%
Total	\$78,638	66.5%	\$9,111	\$69,527	88.4%

Sales Programs	Sales Revenue Alloc	Sales Rev Alloc %	Pgm Exp Accr	Contrib Margin	Sales Contrib Margin %
Sales Visit					
Info	\$4,371	3.7%	\$3,303	\$1,068	24.4%
Close	\$5,369	4.5%	\$4,800	\$569	10.6%
Subtotal	\$9,740	8.2%	\$8,103	\$1,637	16.8%
Sales Call	\$8,372	7.1%	\$1,038	\$7,334	87.6%
Private Seminar	\$21,450	18.1%	\$4,205	\$17,245	80.4%
Total	\$39,562	33.5%	\$13,346	\$26,217	66.3%

2.4 Sales Reporting and Analysis

2.4.1 Case situation

A software company tracked tens of thousands of market segments: 85 products × three dozen geographic segments × 20 customer industries × six major application areas × licenses and support services × four main licensing options. (Theoretically, these numbers multiply out to 2.9 million segments.) Products were usually used together in various combinations in different applications. The company managed this complexity with a dozen management boards for a dozen business segments, plus management boards for functional departments such as marketing, sales, and finance. Tracking sales trends was enormously complex, not to mention understanding the causes and taking corrective action.

The company already had good sales reports for the largest segments. However, the reports did not adjust for systemic distortions in prices, exchange rates, license types that served more users and were price higher, timing of payment of service orders. For example, Japan looked roughly half its real size in revenue reports because it was served by indirect distribution that had lower transfer prices than company-owned distribution channels.

Discussions at the dozen segment management board meetings were revealing. People asked many perceptive questions whose answers had actionable consequences, but the company did not have reliable answers. Important issues were often decided by anecdotes and speculation.

2.4.2 The challenge

The first challenge was to build basic reports that slice revenue and sales units into tens of thousands of segments, roll them up to company totals, and present them in a flexible exploration environment.

The second challenge was to identify the actionable questions from product managers and from management board meetings that could be answered with data-backed information, and design reports that answered these questions. This process continued for about four years as the reports improved to provide more actionable information that affected decisions.

The third challenge was to coach product managers and executives in how to use the new reports to help improve decisions.

2.4.3 The solution

The sales reporting system presented many views.

- Revenue and sales units by tens of thousands of segments, rollup up to company totals.
- Trailing four-quarter reports that eliminate seasonality and diminish the distortion of trends caused by random large orders
- Installed base reports that answered many important questions about where the company’s products were used.
- Product correlation reports that quantified which products were purchased together in which market segments.
- Application reports that quantified how often each product was used in each major application area.
- Customer reports that showed how many of each product a customer owned and had recently purchased.

The new reports that adjusted for the major factors that distorted trends in the regular reports.

- Adjust for distributor pricing, exchange rates, and other regional pricing factors
- Adjust for concurrent licenses that effectively serve more users (and cost more) than individual named user licenses.
- Measure the effects of discounting, especially volume discounting by market segment.
- Eliminate the effect of early payment of service contracts, which was large, and distorted trends.

The following sales reporting application was not generated by ModelSheet. Sales reporting involves large volumes of reports with relatively little analytical complexity. Therefore it is not among the first applications we have done with ModelSheet.

Figure 9: Pivot Sales Report with High-level and Low-level Views

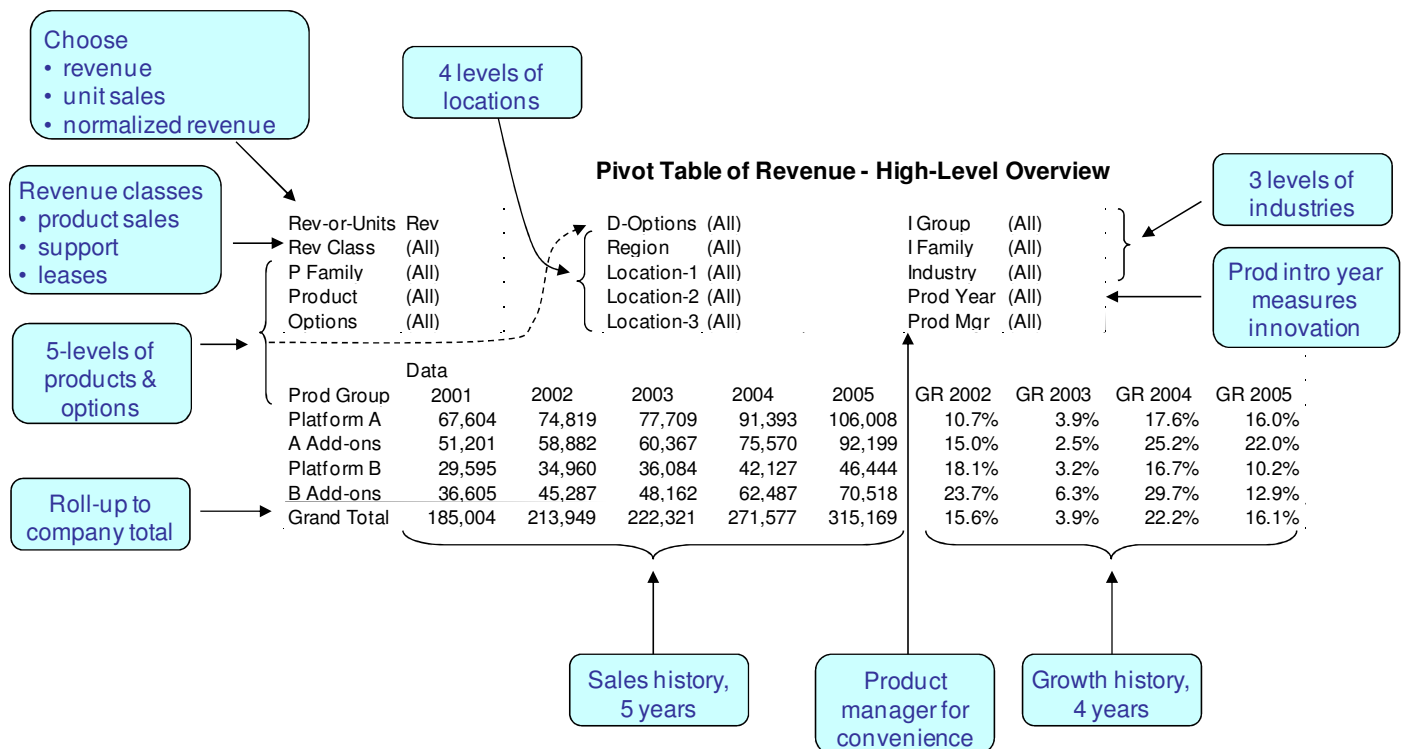


Figure 10: Sales reports should show appropriate detail for all levels of management

Region	Location-1	Location-2	Location-3	Data				
				2002	2003	2004	2005	
EMEA	France			18,924	31,789	45,331	35,634	
	Germany			32,077	43,970	47,089	48,574	
	Nordic			8,868	23,509	3,280	28,703	
	UK			28,758	22,718	27,321	44,693	
	EMEA-Tier 2	Benelux			15,706	-3,284	15,045	11,273
			Israel		5,512	20,296	-1,364	23,076
			Italy		5,186	4,794	21,493	4,208
			Spain		15,768	9,587	1,603	11,524
			Switzerland		17,337	13,304	8,484	13,490
	EMEA-Other	Czech Republic			6,142	3,282	-6,382	-9,105
			Greece		15,084	1,248	-8,695	-11,381
			Hungary		-6,499	1,252	9,135	5,142
			Poland		-11,251	15,902	-1,053	14,851
			Russia		-10,434	8,432	-8,189	-7,157
			S Africa		-7,036	345	-11,253	3,578
Turkey				14,639	-1,298	2,848	2,833	
EMEA-Remainder				15,349	10,239	9,295	-1,363	
EMEA-Other Total				15,993	39,403	-14,294	-2,602	
EMEA-Tier 2 Total				75,503	84,099	30,966	60,968	
EMEA Total				164,129	206,086	153,989	218,573	

Figure 11: Customer-level Sales Report with Order Attach Rates

Order Attach Rates by Customer Site

Site age probes how well you attract new customers.

2-levels of customer organization

Rev-or-Units	V-Units
Rev Class	Perp
Options	(All)
P Group	(All)
P Family	(All)

Prod Mgr	(All)
Prod Year	(All)
Region	(All)
Location-1	(All)
Location-2	(All)

I Group	(All)
I Family	(All)
Site Age	(All)
CoState	(All)
CoSalesT	(All)

Parent Company	CompanySite	Product Data		Product A		Product B		
		Platform 1	Platform 2	2005 %P1	2005 %P1	2005 %P1	2005 %P1	
Intel Corp	Intel R&D	170	25	14.7%	103	60.7%	71	41.8%
	Intel Corp India	29	0	0.0%	5	17.0%	1	3.4%
	Intel Corp	13	4	31.9%	13	103.7%	6	47.9%
	Intel Corp UK Ltd	22	0	0.0%	10	45.5%	16	72.9%
	Intel Corp Salem, Oregon	1	0	0.0%	0	0.0%	0	0.0%
	ZAO Intel A/O	1	0	0.0%	0	0.0%	0	0.0%
	Intel Electronics 74 Ltd	1	1	157.7%	1	157.7%	1	157.7%
	Intel Products M Sdn Bhd	1	0	0.0%	0	0.0%	0	0.0%
Intel Corp Total		237	30	12.6%	132	55.6%	95	40.0%

Attach rates relative to product Platform 1.

The figure above shows an example of using customer-specific sales reports to identify sales opportunities. It shows customer sites in the same company doing similar work that have very different ratios between the company's products. There may be a good reason for the different product ratios, but this is the sort of situation that merit exploration with the customer.

This kind of analysis is also useful for comparing companies in similar industries with similar applications.

A useful variant of this approach is "market basket analysis." This analysis reports how often certain combinations of products are purchased together, and compares the market baskets purchased by different customers.

Figure 12: Color Maps help spot segments with above and below-average performance

		Automotive Industry								Auto Total
		North America Total	European Countries					Europe Total	Asia Total	
Product Family	Product		France	Germany	Nordic	UK	Other			
Platform Product	Platform	%	%	%	%	%	%	%	%	%
Product family 1	Add-on #1	%	%	%	%	%	%	%	%	%
	Add-on #2	%	%	%	%	%	%	%	%	%
	Add-on #3	%	%	%	%	%	%	%	%	%
	Add-on #4	%	%	%	%	%	%	%	%	%
Product family 1 Total		%	%	%	%	%	%	%	%	%
Product family 2 Total		%	%	%	%	%	%	%	%	%
Product family 3 Total		%	%	%	%	%	%	%	%	%

Key: = product attach rate significantly higher than global industry average
 = product attach rate significantly lower than global industry average
 = product sales are too low to consider attach rate

France has above-average sales of Platform product in Auto industry.

France has below-average sales of two add-on families in Auto industry.

UK does not have significant above-average sales of any add-on product in this family.

UK has below-average sales of Platform product in Auto industry.

UK has above-average sales of two add-on families in Auto industry.

The color map above gives you a quick sense of what segments are doing better or worse than the global average. The company in the case study presented these tools to their largest foreign office, showing how to zero in on a problem.

- Show that a country has lower attach rates for some key products in certain industries, compared to global averages.
- Trace the deficiency in sales to specific customer companies and sites.
- Related the deficiency to specific marketing programs that were not carrying their weight.

When Marketing introduced these methods to the foreign office, they got an ovation.

2.4.4 Case outcome

The marketing, finance and I.T. departments collaborated on a new sales reporting system that enabled the product managers and the management boards to provide quantitative answers to a vast array of key questions. The new sales reports became the backbone of sales analysis and a key factor in decision making. The project was widely regarded as the most valuable analytics project the company had undertaken in many years.

2.5 Sales Planning/Forecasting

2.5.1 Case situation

A company had tens of thousands of market segments, defined by products, countries, customer industries/sectors, licenses versus services, and license options. The sales managers controlled the plan, subject to the president approving a few totals. The process barely utilized the insights of product managers and industry marketing managers. The process weakened the buy-in to the annual sales plan, because it disenfranchised people who often knew more about specific issues than the people who made the plan.

2.5.2 Challenge

The first challenge is to build a consistent annual sales plan with over ten thousand market segments.

The second challenge is to obtain realistic plans for a few thousand segments. The old plans were accurate for perhaps a few hundred segments.

The third challenge is to combine managers' inputs with trends extracted from historical data. Product managers and industry marketing managers should have input to the plan, to bring their unique perspectives to bear, along with channel managers and executives who always influenced the plan. Finally, historical data should shape plans for smaller segments, consistent with management targets for related segments, at a level of detail where humans cannot plan effectively.

The fourth challenge is to identify and quantify inconsistencies among managers' targets. (For example, if all product managers predict 5% growth and all country managers predict 10% growth, then no sales plan can agree with all the targets. Inconsistencies among managers' targets can be much more subtle than this.) The inability to identify and resolve these inconsistencies is a major barrier to combining the inputs of product, industry, and channel managers in the same plan.

2.5.3 Solution

Broadly speaking, let managers' judgment control the overall plan and any segments they choose; let historical data provide detail that humans don't know or don't want to provide – such as how to allocate sales of a given product over distribution channels in sales locations in customer industries.

- a) Collect sales target from executives, product managers, sales managers, and industry managers, for products and product support. Let managers specify the list prices and price discount percentages by product and market segment (by sales location, distribution channel, customer industry, and license type) for each plan time period.
- b) Extract trends of sales units and of revenue from historical sales data for each product in each market segment for products and support contracts.
- c) Combine managers' input targets for selected segments with trends extracted from historical data to forecast revenue and sales units. Set maximum and minimum (negative) growth rates that the historical regressions are allowed to predict, to prevent products with erratic trends from growing wildly and distorting the overall sales plan.
- d) For each new product (for which there is no historical sales data), allow managers to specify the time period of first sale, sales units in the first time period, the rate of growth of sales units in each plan time period, and price in each plan time period. To determine the distribution of sales over market segments, managers specify a "model product" whose distribution of sales over segments the new product mimics.
- e) Adjust the sales plan for each product, each sales location, each distribution channel and each customer industry) to match managers' targets as best they can.

A key part of the planning process is to identify segments where managers' targets conflict with one another and broker discussions between the managers in these areas. For example, trying to fit a sales plan to all managers' targets may reveal that the manager for Product A, the manager for Europe, and the manager for the worldwide auto industry may disagree on how many units of Product A will be sold in Europe; that is, no reasonable plan can match all the targets. In this case, proceed as follows.

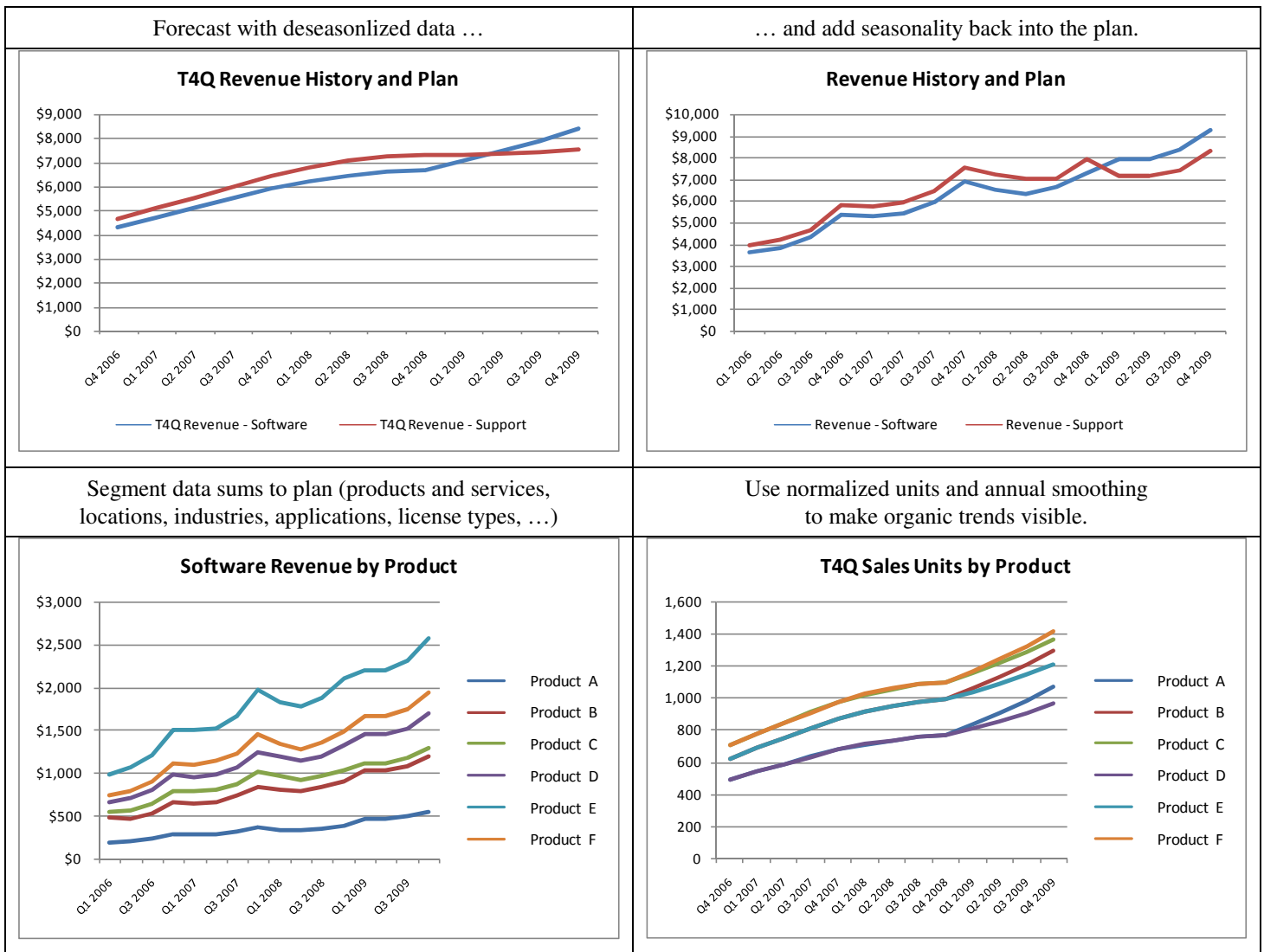
- a) Use the planning tool to identify the segments are the source of the problem, and to quantify the disagreement.
- b) Use the planning tool's adjustments for "two-factor segments" (such as product and sales location together) to refine the plan to meet all managers' targets.
- c) Use the remaining lack of fit of the plan to targets as the basis for discussions among the managers about the disagreement. If the managers of different segments can't agree on consistent sales targets, then the planner must choose how the plan compromises the targets for some segments, and each manager has documentation of what he believes are the right targets.

2.5.4 Case outcome

These sales planning methods were implemented in one planning cycle and refined for several cycles. The plan had consistent estimates for over ten thousand segments and reasonably accurate plans for perhaps a thousand segments. For the first time, product managers and industry managers had serious input to the plan. The planning method pointed out where manager’s targets conflicted with one another. The sales plan was more realistic and got more buy-in.

The charts below show combined revenue history for three years and sales plan for the final year. The charts on the right show trailing four-quarter trends, which eliminate seasonality and minimize the distortions due to random fluctuations and large orders.

Figure 13: Sample Sales Plan Generated by ModelSheet Sales Planning Application



2.5.5 Spreadsheet application

The ModelSheet application “Sales Plan” implements the forecasting methods described above. Visitors can customize and download complimentary working spreadsheets for sales planning at <http://templates.modelsheetsoft.com/modelsheettemplates/sales-plan-templates.aspx>.

2.6 Pricing Decisions

2.6.1 Case situation

A software vendor wanted to set academic prices to satisfy two conflicting objectives: first, generate revenue from academic sales; secondly, seed the market so that graduates will their new employers to purchase the company's products.

2.6.2 Challenge

The broad challenge is to set prices that optimize revenue, or profit, or market share or some other metric. This challenge breaks into at least two parts.

- a) First, you must test response to prices without upsetting the broad market with experimental price changes. You must avoid the many flaws that can impair or invalidate pricing tests.
 - Price sensitivity may differ at different price levels. You must test a sufficient range of prices to detect this.
 - Price sensitivity may differ across market segments, so that combining them in one test distorts results.
 - Extraneous factors can be confounded with price sensitivity, such as seasonal effects, levels of advertising, strength of distribution channels, competitors' actions.
 - Customers may find out about lower prices in other test markets and buy there.
 - Customers may learn that the prices are temporary and adjust their purchases according.
- b) Secondly, you must extract from noisy data valid conclusions about the impact of price on purchasing behavior.

2.6.3 Solution

The analysis helps answer the following questions.

- What price(s) optimize revenue?
- What price(s) optimize profit margin? (You can optionally enter cost as a function of sales units, including nonlinear scale effects.)

The solution has two parts.

- a) Perform market tests from which you can estimate reactions to price changes. The tests must avoid the pitfalls described above.
- b) Extract information from noisy test results that helps make better pricing decisions. The models estimate a quantity called price elasticity. Price elasticity answers the question, "For each 1% change in price, how much do unit sales change?" That is,

$$\% \text{ change in unit sales} = \text{price elasticity} \times \% \text{ change in price}$$

Therefore

$$\% \text{ change in revenue} = (1 + \text{price elasticity}) \times \% \text{ change in price}$$

The analysis can be performed at two levels of complexity.

- "Constant elasticity" assumes price elasticity is constant across the range of prices tested. It estimates whether raising price(s) by x% will increase or decrease revenue and profit, and by what percentage, based on your pricing test results.
- "Generalized elasticity" allows price elasticity to vary across the range of prices tested. Besides estimating the response to price changes, this method uses test results to estimate what prices maximize revenue and what prices maximize profit margin. It can estimate optimal prices because it models the relationship between price and sales units as (a logarithm of) a quadratic curve, whereas the simpler analysis models this relationship as (a logarithm of) a straight line.

2.6.4 Case outcome

The software company performed pricing tests for limited amounts of time on a few products representative of each class of products. Buyers responded differently to price for basic products and for optional add-ons, and in various application areas. The analysis estimated the impact of price changes on revenue, and management weighed the revenue impact against the gain or loss of market share among faculty and new graduates. Academic marketing had a solid evidence for predicting impact of price changes on sales. Management weighed the relative importance of revenue and seeding the market.

2.6.5 ModelSheet applications

ModelSheet offers two applications for pricing analysis.

- The simpler model uses market tests to estimate the price elasticity of one product. Visitors can customize and download complimentary working spreadsheets at <http://templates.modelsheetsoft.com/modelsheettemplates/product-price-elasticity-templates.aspx>.
- The second model estimates the price elasticity of several products and the “cross-elasticities” among products; that is, it analyzes the impact of the price of each product on the sales of related products. The products can include your products and competitors’ products and their price interactions. Visitors can customize and download complimentary working spreadsheets at <http://templates.modelsheetsoft.com/modelsheettemplates/price-elasticity-templates.aspx>.

Figure 14: Pricing Test Data, Raw and Normalized

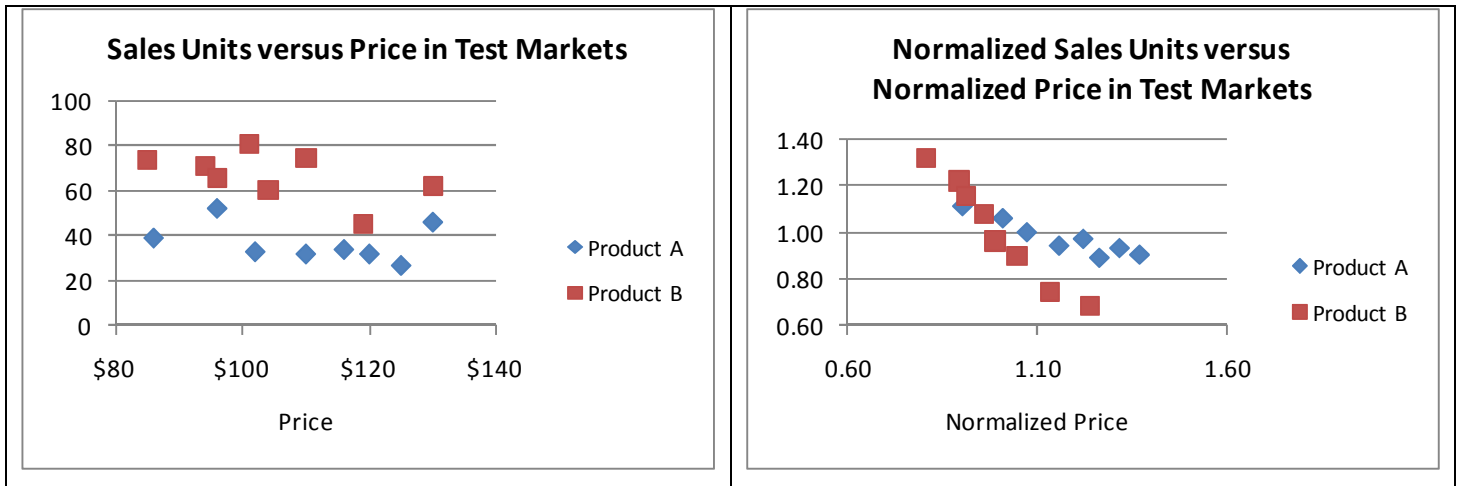
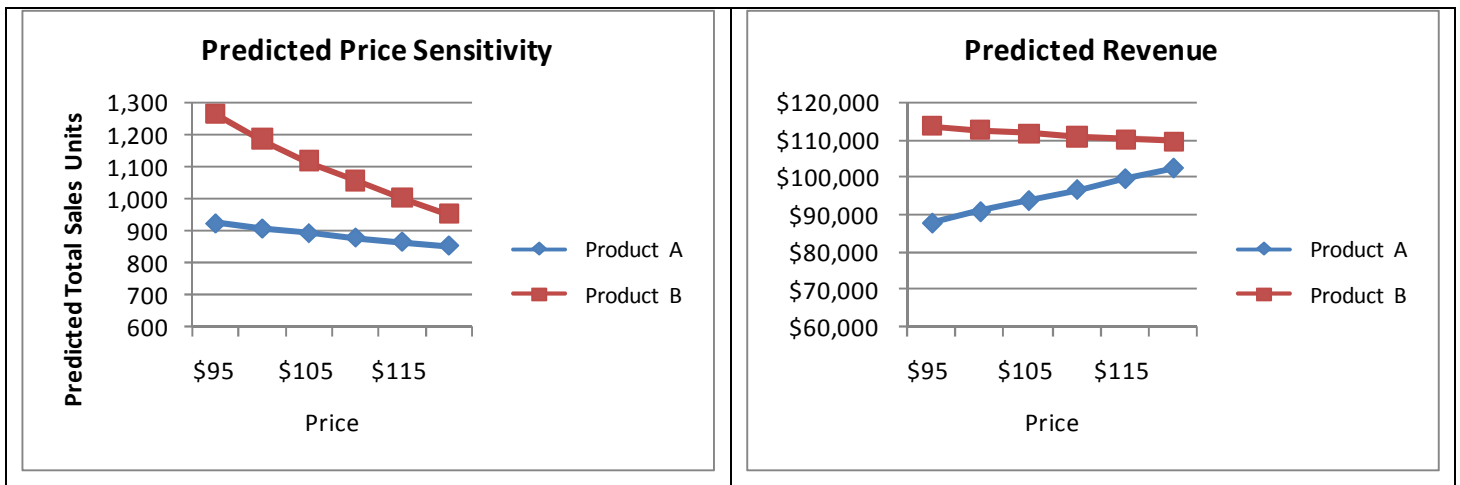


Figure 15: Price Sensitivity and Revenue Impact, Predicted from Pricing Test



2.7 Bug Tracking - For Development-Centric Product Managers

This is a relatively simple analysis that is of interest to product managers who are closer to product development than to marketing.

2.7.1 Case situation

A software company already had reasonable data and reports for tracking bugs. Several problems remained

Bug reports were not sufficiently targeted to provide the actionable information that first-line product managers needed, and the overviews that the VPs and the president needed to oversee product management.

Response to requests for customizing reports was slow and costly, because of the complex reporting technology used.

2.7.2 Challenge and Solution

A number of design principles can add value to the reports.

Start by segmenting your information constituencies by information needs and preferences. Find out which views and levels of detail are most useful to each user constituency. Make the favorite views of each major constituency available out-of-the-box with no customization required.

Secondly, provide different levels of detail and aggregation of information for product managers, directors and the VP or president. It is preferable to do this in the same report, or in closely-related reports that draw from the same data, to facilitate communications and comparisons. For senior managers, less information is better than more information if the difference is marginally relevant information. This principle applies to:

- Report bugs by organizational teams. Developers need to see the bugs for which they are responsible. Senior managers may prefer to see larger organizational units, with the option to drill into details as needed.
- Report bugs by product families, products, and product components. Executives may prefer data for bugs by product families, while engineers and first-level managers probably focus on bugs by product component.
- Report bug status at several levels of detail. The top-level might have two states: “fixed” and “not fixed.” The detailed level can include states with more detail, such as “fixed not tested”; “fixed tested not audited”; “fixed tested audited”...
- Report bugs with several time grains: daily counts for product managers and weekly or monthly totals for senior managers.
- Track progress of bugs through the system. A detailed view might classify bugs by time since discovery, time since last promotion to a new stage, number of bugs entering the system per time period, number of bugs resolved per time period. The top level view might just classify bugs by how long they have been in the system.
- Report bugs by severity. The detailed view of bug severity might have two dimensions: (a) estimated frequency that a bug affects a user, and (b) estimated impact of the bug on affected users. The less detailed view might collapse these factors into one-dimension.

Thirdly, let I.T. keep the data, and let people who are close to the report users design the reports. Use simpler reporting technologies where possible, such as spreadsheets and pivot tables. Pivot tables are great for this kind of reporting because you can easily build multiple views of the same data with different levels of detail and different emphases.

2.7.3 Case outcome

Some executives and product managers adopted the bug reporting system described above as their preferred source of information. The customer support department approached the team that built these reports to do their customer case tracking, which was outside of normal organizational channels.

3 Conclusion

The information revolution makes analytics the second-fastest moving frontier in marketing, after internet marketing. Analytics can help you make better decisions, and present more compelling arguments for correct conclusions. Product marketing and product management are fertile areas for analytics because they interact with many businesses areas.

Users of business analytics don't have to be analysts. Good users of analytics should frame questions that help the company to make better decisions, and challenge analysts to answer those questions with information backed by hard data. Users of analytics and analysts should collaborate to determine the analyses and reports that best assist constituencies make better decisions.

Business domain experts who sponsor spreadsheet applications don't have to be IT professionals. Domain experts can introduce and use spreadsheet applications with minimal dependence on IT professionals.

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