Three Simple Methods for New Product Sales Forecasting

NEW PRODUCT INNOVATION
No. 13 in a Series of Papers

Reference Paper by:
Teresa Jurgens-Kowal
PhD, PE, NPDP

Global NP Solutions
2323 Clear Lake City Blvd., #180
Suite 177
Houston, TX  77062
PHONE:  281-280-8717
FAX:       281-280-8689
Despite all the fun “work” expended to develop a new product, we only should be working on products that will deliver financial rewards to the company. Certainly, there are products that “go viral” as illustrated by the re-discovery of Hush Puppy shoes in Malcolm Gladwell’s classic “The Tipping Point.” But, most of us need to provide specific metrics to our management in order to demonstrate that the new product idea will actually generate a profit.

Sales forecasts are tricky even for mature products in existing categories. Sales forecasts are tricky even for mature products in existing categories. Sales forecasts are tricky even for mature products in existing categories. Sales forecasts are tricky even for mature products in existing categories. In this paper, we offer some simple methods to estimate new product sales at earlier stages in the development process.

CPAS STUDY

The 2003 CPAS study (Comparative Performance Assessment Study) conducted by the Product Development and Management Association (PDMA) showed, not unexpectedly, that the success of new product forecasts increases as development progresses. Of course, a decreasing percentage of projects advancing to the next stage is a risk-management tool inherent in New Product Development (NPD). For example, the CPAS study shows that only 64% of new product ideas will advance from Stage 1, Idea Screen, to Stage 2, Business Analysis. Similarly, 85% of new products in Stage 4, Test and Validation, will advance to Commercialization. Business risk is decreased as more information is learned about the product, prototypes are tested, manufacturing processes are designed, and marketing plans are developed. Thus, our sales forecast of the new product becomes more predictable and more stable as each development gate is subsequently passed.

In “New Product Forecasting,” Kahn suggests that this behavior, the so-called “new product mortality curve,” can be determined for any company or business unit with a number of new products that have been previously commercialized. Prior development cost and time data can be used to estimate budget and schedule, while success in the marketplace can be used to establish profitability risk patterns.
IMPACT ON THE BOTTOM LINE

For example, following the standard new product mortality curve from the CPAS study, we find that only 22% of new product ideas lead to success upon commercialization. Of the products commercialized, the accuracy of the sales forecast was shown to be just 58% overall and only 50% one year after launch. Being accurate in the sales forecast only about half the time will lead to either manufacturing twice as much inventory as required (an excessive expenditure reducing profits) or generating only about half the required demand.

An alternative, perhaps more optimistic, view is to find your company unable to supply half the customers wanting and able to purchase your product, as was the case with Nintendo’s Wii game console released in 2007.

So, a missed new product forecast directly impacts the bottom line. What can we, as New Product Development Professionals and practitioners, do to improve the New Product Sales Forecast?

NEW PRODUCT TYPES

First, the methodology and accuracy of a sales forecast for the new product depends on the type of new product under development. Recall the six types of new product categories as a function of the market mix matrix. Note that an additional new product category consists of Cost Reductions achieved through efficiencies in manufacturing, distribution, etc. and is not shown in the figure.

While Cost Reductions can lead to a new product, the sales forecast is not normally handled by the NPD Team. Financial, managerial, or cost accountants will work with manufacturing, operations, and supply chain personnel to develop a new profitability model for the product "as produced today" and "as produced after the cost improvement" steps are implemented. We can expect the accuracy of the sales forecast for a Cost Reduction project to be very high. This is because unless the market can bear it, the Cost Reduction project will not change the quality of the product and changes will be essentially invisible to the customer or end-user.
On the other hand, forecasting for products with new markets, such as New Use or New-to-the-World products, may require significant Market Research in order to gather enough data for the NPD Team to proceed with confidence. Thus, we will focus on the bread-and-butter of most NPD practitioners – Product Improvements and Line Extensions.

**FORECASTING METHODS**

As the new product project advances through the structured NPD Process, financial forecasts are an important metric that gatekeepers will review and scrutinize. Again, profitability is the goal of all companies and new product development efforts are an effective path to achieving revenue growth. Note that the purpose of the forecast, and the subsequent managerial analysis, will change with each stage (3).

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Forecasting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Opportunity Identification</td>
<td>Qualify Market Opportunities</td>
</tr>
<tr>
<td>2</td>
<td>Concept Generation</td>
<td>Revenue Potential</td>
</tr>
<tr>
<td>3</td>
<td>Concept Evaluation</td>
<td>Preliminary Sales Forecast</td>
</tr>
<tr>
<td>4</td>
<td>Development</td>
<td>Baseline Volume Sales Forecast</td>
</tr>
<tr>
<td>5</td>
<td>Launch</td>
<td>Final Sales Forecast</td>
</tr>
<tr>
<td>PLR</td>
<td>Post-Launch Review(s)</td>
<td>Adjust Market Plans</td>
</tr>
</tbody>
</table>

Perhaps the most critical forecast for the new product development effort occurs during Stage 3, after the Fuzzy Front End work is completed and large investments are committed in the Technical and Commercial Development Stages.

Popular sales forecast methods include:

- Jury of Executive Opinion (3),
- Historical Trend Analysis, and
- ATAR Model.

**JURY OF EXECUTIVE OPINION**

Kahn (3) describes the Jury of Executive Opinion as a top-down forecasting technique that arrives at a sales expectation by largely ad-hoc, “gut-feel” methodologies. Experts in Sales and Marketing functions from the business line will often meet face-to-face or virtually and hammer out a sales forecast for the new product by sharing combined expert opinions, predictions, and other information. The forecast is then broken down into increasingly smaller units by geography, region, and/or individual salesperson for reporting and accountability.

Scenario Planning, or “What-If” Analysis, often is a key discussion held by these experts. With scenario planning, the project team can develop indicators so that the company can plan and respond to emerging situations before the competition (6). For example, in a
line extension project, the jury of executives may dialogue about a specific scenario in which the project is delayed for a period of time, the competition introduces their new product first, and sales would be negatively impacted by 25% in North America.

**HISTORICAL TREND ANALYSIS**

Another widely used tool is Historical Trend Analysis. Here we assume that past performance is **indeed** an indicator of future sales. Basic Diffusion Models estimate the ratio of cumulative sales as a function of sales and time, whereas simpler trend models look at sales vs. time alone. Rao has found that **simple extrapolations of trends** give the best fit across new products in the consumer durable goods markets (e.g. dishwashers and televisions). Simple trend models can be built using typical spreadsheet software with data from a similar product released in a similar market. These numbers can be developed in aggregate for a particular business unit, adding both technology and commercial risk. Cooper calls this the **Expected Commercial Value (ECV)**:

\[
ECV = [(PV \times PCS - C) \times PTS] - D
\]

where **ECV** is the Expected Commercial Value, **PV** is the Net Present Value of the project’s future earnings, **PCS** is the probability of commercial success, **C** is the cost of launch, **PTS** is the probability of technical success, and **D** is the remaining development cost for the project.

Existing sales information is derived from internal records, from order-to-pay cycle analysis, the sales information system, data warehouses, supplier inventory systems, and marketing intelligence systems. Particularly important in NPD are the **micro-sales analyses**. That is, looking at specific products, technologies, or regions that failed to produce the expected sales.

Accounting techniques, such as **Variance Analysis**, may be useful in Historical Trend Analysis, especially in root cause determination to extend learnings to the current NPD effort.

**ATAR MODEL**

The ATAR Model is most similar in format to a sales forecast, predicting market penetration by:

- **Awareness**,  
- **Trial**,  
- **Availability**, and  
- **Repeat** purchase.

Knowing the overall market size (3 million potential units in the example shown here), we estimate the **awareness** of our new product

---

© Copyright 2010 Global NP Solutions, LLC  
www.globalnpsolutions.com  
page 5
(40% in the example) and the number of consumers willing to try it (20%), and calculate the potential market as 240,000 units. If our new product is only available to 40% of those potential customers due to distribution limitations, for instance, and each customer will buy three units every two years, our annual unit sales estimate by the ATAR method is thus 72,000 units per year. Finally, knowing our profit per unit is $13.50, we estimate a profitable return of $972,000 for this new product.

ATAR is most commonly used for consumer packaged goods. The model is generally not as useful for consumer durable goods, since the trial and repeat purchases are not normally part of the average buying experience.

**Summary**

New Product Forecasting is a difficult but important task to determine project success.

Early in the NPD effort, the team must prepare a simple business case, including customer needs, product ideas, strategic fit, and rough forecasts of sales and profitability. After all, companies are in business to make money!

In this paper, we’ve discussed three common models to develop an initial sales forecast for the new product:

- Jury of Executive Opinion,
- Historical Trend Analysis, and
- ATAR Model.

Many other predictive models are described in the literature; however, with the lack of full definition of the product, especially in the Fuzzy Front End, simple methods are often more useful, and more accurate, than complicated ones.

**Quick Reference Glossary**

Check our [website](http://www.globalnpsolutions.com) for a quick and easy list of terms used in New Product Development. Some terms used in this article are shown here.

**Cost Reduction Project**: A type of new product project that does not introduce dramatic changes to the product, but can influence consumer behavior by implementing new pricing or other cost advantages.

**Customer**: One who purchases or uses your firm’s products or services.
Diffusion Model: The process of how new products get adopted as an interaction between users and potential users. The model is widely used in forecasting, especially product forecasting and technology forecasting.

Expected Commercial Value (ECV): A variation of decision-tree analysis which discounts future revenues by the probability of commercial and technical success, combined with the cost of commercialization and development for a new product project.

Fuzzy Front End: The messy "getting started" period of product development, when the product concept is still very fuzzy. Preceding the more formal product development process, it generally consists of three tasks: strategic planning, concept generation, and, especially, pre-technical evaluation. These activities are often chaotic, unpredictable, and unstructured. In comparison, the subsequent new product development process is typically structured, predictable, and formal, with prescribed sets of activities, questions to be answered, and decisions to be made.

Historical Trend Analysis: A mathematical technique that uses historical results to predict future outcome. This is achieved by tracking variances in cost and schedule performance, for example, in the context of project management quality control.

Market Research: Information about the firm’s customers, competitors, or markets. Information may be from secondary sources (already published and publicly available) or primary sources (from customers themselves). Market research may be qualitative in nature, or quantitative.


New Product Development Process (NPD Process): A disciplined and defined set of tasks and steps that describe the normal means by which a company repetitively converts embryonic ideas into salable products or services.

New Use: A new product project which seeks to position an original product in a new market without substantially changing the original product.

Product Launch: The process by which a new product is introduced into the market for initial sale.

Project Team (or NPD Team): A multifunctional group of individuals chartered to plan and execute a New Product Development project.

Root Cause Analysis: Root Cause Analysis is a method that is used to address a problem or non-conformance, in order to get to the “root cause” of the problem. It is used so we can correct or eliminate the cause, and prevent the problem from recurring.

Sales Forecast: Projection of achievable sales revenue, often based on historical sales data, analysis of market surveys and trends, and
salespersons’ estimates. Also called sales budget, it forms the basis of a business plan because the level of sales revenue affects many aspects of commercialization of a new product.

**Scenario Planning:** A tool for envisioning alternate futures so that a strategy can be formulated to respond to future opportunities and challenges. Also known as "What-If" Analysis.

**WORKS CITED**


ABOUT THE AUTHOR

Teresa is President of Global NP Solutions, LLC, a strategic innovation provider. She is an accomplished visionary and results-oriented professional with extensive industry experience from creative research to effective portfolio management through stream-lined new product development processes.

Prior to founding Global NP Solutions, Dr. Jurgens-Kowal acquired over 12 years of experience in leadership and management positions with ExxonMobil Chemical Company and a total of 16 years as a practicing Chemical Engineer. Her corporate career encompassed various functions, including New Product Development, Portfolio Management, Licensing, Marketing, Logistics and Supply Chain, Manufacturing, Project Management and Research Technology.

Teresa has extensive experience leading successful teams, managing the product development life cycle, and defining the portfolio strategy. Her deep expertise in intellectual property management, product and process licensing, portfolio planning, customer service and various business processes make her an ideal teacher and trusted advisor who knows both the theory and practices of New Product Development.

Dr. Jurgens-Kowal earned a B.S. degree in Chemical Engineering from the University of Idaho in Moscow, Idaho and a Ph.D. in Chemical Engineering from the University of Washington in Seattle, Washington. She is a licensed Professional Engineer in the State of Louisiana since 1998. Teresa is a certified New Product Development Professional (NPDP) by the Product Development Management Association (PDMA) and Global NP Solutions, LLC, is a Registered Education Provider (REP) with PDMA. She is also a member of the American Institute of Chemical Engineers (AIChe), the American Marketing Association (AMA), and volunteers with the Houston Chapter of the American Society of Training and Development (ASTD).

Teresa holds chemical process and catalyst patents, and is published in the Journal of the American Chemical Society and Journal of Physical Chemistry. She is a frequent book review contributor to the Journal of Product Innovation Management.

Currently, Dr. Jurgens-Kowal is working on founding a Gulf Coast Chapter of the PDMA organization. She has an office in Houston, Texas. In her free time, Teresa enjoys scrapbooking and gardening.