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# An Investigation into the New Product Process: Steps, Deficiencies, and Impact

## Reference Paper #6

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# An Investigation into the New Product Process: Steps, Deficiencies, and Impact

Robert G. Cooper and Elko J. Kleinschmidt

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*In a comprehensive study of 252 new product histories at 123 firms, Robert Cooper and Elko Kleinschmidt looked critically at the new products management process. Each company was shown a set of 13 activities which formed a general "skeleton" of a new product process. This article examines how this structure was modified by the companies and how well various stages of the process were reportedly executed. The results show a variety of practices among the surveyed companies. While the presence of activities cannot guarantee successful new products, certain activities were singled out as particularly weak. Firms should consider placing more emphasis on market studies, initial screening activities, and preliminary market assessment. The article provides a thoughtful assessment of the level of implementation of current practices in new products management.*

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## Introduction

New products are critical to the growth and prosperity of most firms, but product innovation is plagued by high risks: both the large amounts at stake and the high probability of failure [2,4,8]. Most recently, there has been a call to focus on the new product process itself as the key to a more successful new product program [1,3,9]. This article reports the results of a new research study—NewProd Phase II—that looks closely at the new product process: what happens, how well various steps are carried out, and what impact each step has on new product outcomes.

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## Winners and Losers

Recent years have witnessed several notable studies into what makes a new product a success. Investigations such as the British SAPHO [14,15], Rubenstein's U.S. study [16], NewProd in Canada [5,6,7], and the recent Stanford Innovation Project [11] paint a fairly consistent picture, in spite of different methodologies and locales. These investigations conclude that the following factors are fundamental to new product success:

1. A product differential advantage: a unique, superior product in the eyes of the customer; a high perfor-

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- mance-to-cost ratio; and economic advantages (cost-benefit) to the customer.
2. An understanding of users' needs, wants, and preferences and a strong market orientation, with marketing inputs playing an important role in shaping the concept and design of the product.
  3. A strong launch effort: selling, promotion, and distribution.
  4. Technological strengths and synergy: a good fit between the product's technology and the technological resources and skills of the firm.
  5. Marketing synergy: a good fit between the marketing, sales force, and distribution needs of the product and the firm's marketing resources and skills.
  6. An attractive market for the new product: a high growth market, a large market, and one with a high long-term potential; a market with weak competition and one lacking intense competitive activity.
  7. Top management support and commitment.

Although such studies have shed much light on new product success, they also raise questions. Consider these issues:

- Many of these success factors describe the setting of the project. For example, having marketing synergy, possessing technological synergy, and being in a high-growth, attractive market are useful criteria for project selection. But beyond project selection, what can the manager do to score high on these success factors? In short, many success factors appear to be beyond the control of the project manager.
- Other success factors identified in these studies are within management's control. For example, adopting a strong marketing orientation, designing a product with a differential advantage, and mounting a strong launch effort are all things that people do and control. What is lacking, however, are the specifics: Exactly what does a manager do to become market oriented or to conceive a superior product? In short, these success factors are left fairly general; they are not translated into the details of what managers and new product project teams should do.

In the book, *In Search of Excellence*, Peters and Waterman make a strong case for attention to detail: that success and failure boil down to what people do and how well they undertake these tasks [13]. Many of the authors' prescriptions are disarmingly simple. Similarly, Booz, Allen and Hamilton's study of new product management reveals that the new product process—what happens in those steps from idea to product launch—is key to success [1]. The study concludes that firms that have a disciplined, step-wise new product process are more successful and that those firms that have had the process in place for a longer time do still better.

Could it be that the majority of new product success and failure studies have overlooked the obvious? Could it be that we have been so preoccupied with the "big picture"—questions of strategy, synergy, orientation, and selecting the right technology and market areas—that we have missed key factors in success? For example, few of the success/failure studies have looked at what actually happens during a new product project; fewer still have investigated the strengths and weaknesses of the activities that comprise the new product

process and the impact that their activities have on projects' outcomes. If what happens during the new product process itself—the action details—is key to success, then a clear need exists to examine more closely those actions or activities that make up the new product process.

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## The Research

The investigation described in this article addresses some of these questions; following are specific research questions:

- What happens as a new product project moves from idea to launch? What occurs within each stage of the process—what do people do?
- How well are the tasks or activities undertaken? And what improvements are needed?
- What is the impact of each of these activities on project outcomes: commercial success or failure. Does excellence in each of these tasks really matter?

### *NewProd II*

NewProd Phase II is an extensive and detailed study of 123 firms and 252 actual new product case histories. Only some of the data and findings of the investigation are reported in this article.

In the summer of 1985, senior management in 200 firms was contacted, and 123 firms agreed to participate in the study. The sample of firms was restricted to industrial product manufacturers, who were known to be active in the field of product development, based on both a government listing of firms conducting R&D and private sources. All firms were located in Ontario and Quebec, Canada.

In each firm, those managers most responsible for new products were personally interviewed. In small firms, these included company presidents and vice presidents; in larger firms, they were directors of marketing, R&D, engineering, and/or new products. Two or three new product projects were discussed in detail per firm: a commercial success, a commercial failure,

and a “killed” project.<sup>1</sup> The interviews lasted 3 to 4 hours each and were based on a detailed, pretested questionnaire.

One facet of the interview focused on the new product process. Here, managers were asked to relate the story of each project—a “blow-by-blow” description of what happened from idea to launch. Next, respondents were queried about each of the 13 activities that were thought to comprise the new product process. Respondents were aided in their recall: A brief description of each activity was provided, and respondents indicated whether such an activity was undertaken as part of the project. The 13 particular activities considered were based on both normative and empirically based descriptions of the new product process and are listed in Exhibit 1 [1,3,10,12,15,17].

Each activity was probed in greater detail, using both open-ended (verbal, descriptive) and closed-ended (e.g., rating scales) questions. Only data from projects that were eventually launched into the market are considered in this article: a total of 203 projects, including 123 commercial successes and 80 commercial failures.

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## Results: The New Product Process

What the literature prescribes and what most firms do are miles apart when it comes to the new product process. This was one provocative finding of the study. The literature features numerous process models that describe how firms should develop new products. Reality is much different. Reviews of what actually happened in these 203 projects revealed that many commonly accepted and prescribed stages or activities are altogether omitted from the process. Exhibit 2 shows the frequency results, that is, in what proportion of the 203 projects a given stage or activity was carried out and identified as a recognizable stage or step in the process. Some highlights from Exhibit 2 follow:

- Commonly prescribed activities, such as a market research study, a trial sell, and a detailed business

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<sup>1</sup>Success and failure were defined from a profitability standpoint: whether or not the product's profits exceeded or fell short of the acceptable profitability level for this type of investment.

**Exhibit 1. New Product Process Activities**

Activity <sup>a</sup>	Description
1. Initial screening	The initial go/no go decision where it was first decided to allocate funds to the proposed new product idea.
2. Preliminary market assessment	An initial, preliminary, but nonscientific, market assessment; a first and quick look at the market.
3. Preliminary technical assessment	An initial, preliminary appraisal of the technical merits and difficulties of the project.
4. Detailed market study/market research	Marketing research, involving a reasonable sample of respondents, a formal design, and a consistent data collection procedure.
5. Business/financial analysis	A financial or business analysis leading to a go/no go decision prior to product development.
6. Product development	The actual design and development of the product, resulting in, e.g., a prototype or sample product.
7. In-house product testing	Testing the product in-house: in the lab or under controlled conditions (as opposed to in the field or with customers).
8. Customer tests of product	Testing the product under real-life conditions, e.g., with customers and/or in the field.
9. Test market/trial sell	A test market or trial sell of the product—trying to sell the product but to a limited or test set of customers.
10. Trial production	A trial production run to test the production facilities.
11. Precommercialization business analysis	A financial or business analysis, following product development but prior to full-scale launch.
12. Production start-up	The start-up of full-scale or commercial production.
13. Market launch	The launch of the product, on a full-scale and/or commercial basis; an identifiable set of marketing activities specific to this product.

<sup>a</sup>These activities provide a reasonable “skeleton” of the new product process [1, 3, 10, 12, 15, 17] and were used as a guide during the interviews to help respondents indicate what occurred during their projects.

analysis, were undertaken in less than half the projects studied.

- The weakest activities (most often omitted) were two of the market tasks: test market or trial sell

(done in only 22.5% of the cases) and a detailed market study or marketing research (done in only 25.4% of the projects).

- Other weak activities—undertaken in less than half of the projects studied—were precommercialization business analysis and trial production.

When one stands back and looks at the entire new product process, very few projects—only 1.9%—featured all 13 activities. Exhibit 3 shows the results. Indeed, in the majority of projects studied, less than 9 of the possible 13 activities were carried out—a limited new product process. Further, in almost one third (32.7%) of the projects, seven activities or less were undertaken, that is, approximately half the new product process.

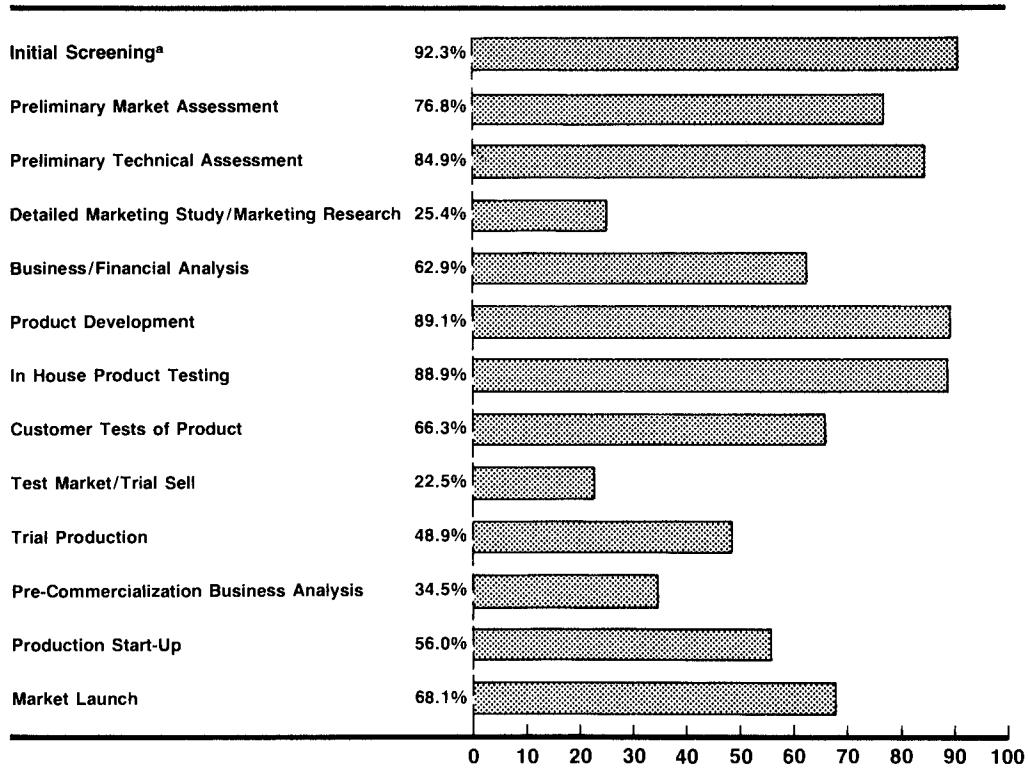
Note that there may be good reasons why certain commonly recommended steps of the new product process should be omitted. This is particularly true in the case of product improvements and line extensions, where a shortened process may be appropriate. However, the data here are based on new product items, not marginal extensions and minor modifications. Moreover, the frequency of omission was substantial, certainly more than one might have expected from the occasional deletion of a step in the process. The evidence suggests that the new product process in practice is a truncated one, particularly when compared to prescribed process models.

### Proficiencies of Activities

In those cases where a certain activity had been undertaken, we probed to determine how well the activity was carried out and to what extent improvements were thought to be required. Exhibit 4 shows the mean results for each activity. (Proficiency was measured on a 0 to 10 scale, where 0 is very poor and very deficiently handled, and 10 is excellent and very well handled; similarly, the need for improvement was also gauged on a 0 to 10 scale, where 0 indicated improvements not needed at all and 10 indicated major improvements needed.) Following are some highlights:

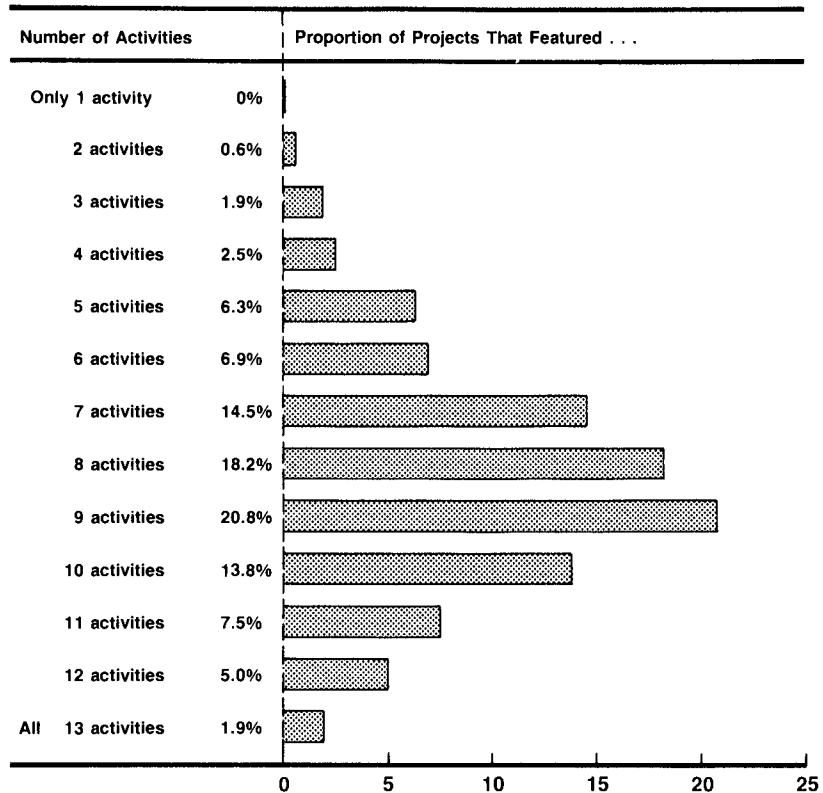
- Overall, the mean proficiency score for all activities was a mid-range 5 to 6 out of 10—not a

**Exhibit 2. Frequency of New Product Process Activities**

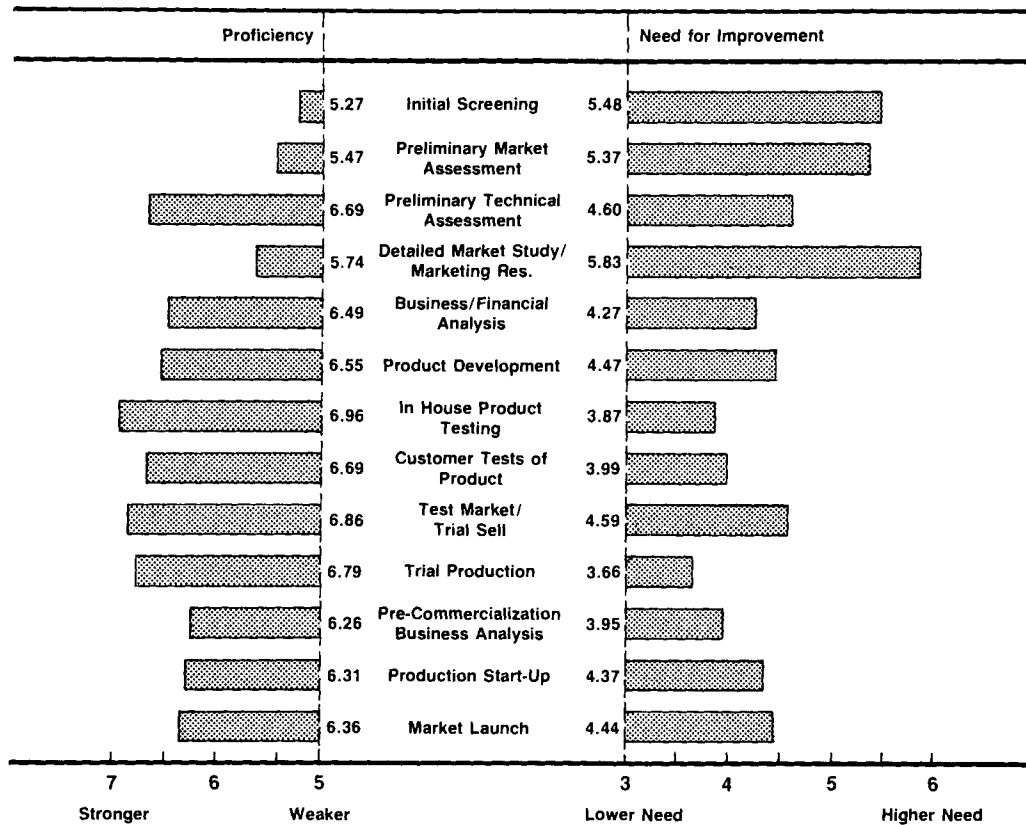


\*In 92.3% of the 203 projects, initial screening was carried out.

**Exhibit 3. Completeness of New Product Process: Frequency of Activities**



**Exhibit 4. The Activities Rated: Proficiencies of Activities and Need for Improvement**



stellar performance. The standard deviations were in the 2 to 3 range (not shown), pointing to a fairly broad variation in performance.

- There were few major differences in proficiencies across activities. The weakest rated activities were the “up front” or predevelopment activities, namely initial screening, preliminary market assessment, and the detailed market study.
- On average, managers indicated moderate need for improvement: in the 3 to 5 range on the 0 to 10 scale. Activities singled out for the greatest improvements were, not surprisingly, the same three up front activities: the detailed market study, initial screening, and preliminary market assessment.

**The Activities: A Descriptive Review**

Space does not permit a detailed description of what happened in each project at each stage of the process.

Here, then, is a summary of these activities across projects.

*The Idea*

Typically, the new product process was initiated by a product idea that was *market derived*—from a customer, salesperson, or competitor. There was less tendency for ideas to be technology driven—an in-house, lab, technical group, or supplier source. For example, on a 0 to 10 scale, where 0 meant “market source,” the average idea scored 3.66, that is, close to the market-derived end of the scale.

The idea did not typically come forth as the result of a proactive, aggressive search. The average idea scored 4.49 on a 0 to 10 scale, where 0 meant “passive search” and 10 meant “aggressive/proactive” search.

The specific sources of ideas were also determined and appear, in descending order of frequency, in Table 1.

*Initial Screening*

Initial screening, although undertaken in over 90% of projects, was rated as the weakest activity, scoring

**Table 1. Sources of Ideas**

Source	Percent of projects
Customer request	20.0
Sales force	17.4
Management	13.3
R&D group/department	12.3
Competitor's product	7.7
Engineering/design group or department	7.2
All others: distributor, service department, creativity session (brainstorming), trade show, result of customer survey, etc.	22.1
Total	100.0

lowest on the proficiency scale, and cited as an activity greatly in need of improvement. A variety of different approaches to screening were uncovered and may suggest why screening was thought to be so deficient. They are listed, in terms of popularity, in Table 2.

Group processes dominated this critical screening decision: the initial "go" decision was a group decision in more than three quarters of the cases. But screening remains very much an informal decision, that is, no consistently used checklist of criteria or scoring/rating procedures. For example, in less than 2% of the projects, evaluators used a formal checklist questionnaire or scoring model to rate projects.

Initial screening was also pinpointed as one of the activities where improvements were sorely needed. Managers were queried about the types of improvements desired, and the main suggestions are listed in Table 3.

**Table 2. Approaches to Screening**

Approach	Percent of cases <sup>2</sup>
1. A group decision, based on an informal discussion—no formal techniques used at all, e.g., no checklists of criteria, no rating forms, etc.	59.5
2. A single individual made the decision, again on an informal basis (no formal techniques).	23.7
3. A group decision, based on a formal checklist of criteria.	11.6

<sup>2</sup>Percent of cases where activity was undertaken; the sum is less than 100% because other "approaches" are not included.

**Table 3. Improvements Desired in Initial Screening**

Suggestion	Percent of cases <sup>3</sup>
Better assessment of the market; more external inputs at this early screening stage.	39.6
More formal and consistent procedures; more detailed evaluation.	23.1

### *Preliminary Market Assessment*

Preliminary market assessment was also rated as a weak activity. It was omitted altogether in almost one quarter of the projects and, when done, was rated a weak 5.47 out of 10, on average.

Preliminary market assessment involved a varied set of tasks. The most frequently mentioned appear in Table 4. Direct customer contact, however, dominated the list.

Preliminary market assessment was also singled out as one stage in need of improvement. A sharper, more focused definition of the market, more customer contacts, and the allocation of more time and effort were the suggestions most frequently cited.

### *Preliminary Technical Assessment*

This activity was rated moderately strongly: it was undertaken in the great majority of projects (84.9%) and was rated as proficiently undertaken. The main tasks carried out are listed in Table 5.

Although preliminary technical assessment was not viewed as a major problem area by managers, there were, nonetheless, several suggestions for improvement:

**Table 4. Tasks Involved in Preliminary Market Assessment**

Tasks	Percent of cases
1. Direct contact with customers	46.3
2. Discussions with the sales force	9.9
3. Review of competitors' products	9.1
4. Access secondary/published data	8.3
5. Knew market already—internal assessment/discussion session only	8.3

<sup>3</sup>Percent of cases where a response was given.



**Table 5. Tasks Involved in Preliminary Technical Assessment**

Task	Percent of cases
1. Capability/feasibility analysis	30.5
2. Engineering assessment	28.9
3. Product specifications	10.2
4. Product design, model development	8.6

- More thorough technical assessment.
- More application oriented and focused.
- Better organized and with more qualified people.
- More formal and better documented.

*Market Research/Detailed Market Study*

The detailed market study stage was among the weakest of all 13 activities in the entire new product process. It was undertaken in only one quarter of the projects and, when carried out, was rated “poorly handled,” on average.

A variety of different types of market studies were undertaken. They appear, in order of popularity, in Table 6.

Concept tests—a study of customer reactions to the proposed new product in concept form—were noticeably absent.

The methods used for these market studies also varied from project to project. The most popular involved personal interviews or detailed face-to-face interactions with customers (31.0% of cases); other firms used outside consultants (24.1%); still others employed no scientific, formal, or structured approach (27.6%). Mail and phone surveys were rarely used in this stage.

**Table 6. Market Studies**

Study type	Percent of cases
1. A study of competitive products and prices.	25.9
2. A study of what customers needed or wanted in the new product—to generate product specs.	18.5
3. A study to determine market size.	18.5

The majority of these market studies focused on the domestic market only (43.2% of cases). A handful of studies (18.9%) included nearby export trading areas<sup>4</sup>, whereas a surprising 37.8% of the studies investigated markets and countries outside the domestic and immediate trading area, that is, rest-of-world countries.

The market research stage was cited as an area where many improvements were needed and possible. Suggestions included the following:

- Better focus—better definition of specific market and segments as the target of the investigation.
- More effort—for example, a larger scope study; more contacts and interviews; more depth to the interviews.
- A better definition of the product and technology before embarking on a field or customer survey.
- More specificity—improved definition of what one is trying to find out (clearer information objectives).

*Business/Financial Analysis*

Many firms (62.9% of cases) conducted a business or financial analysis prior to moving into product development. A variety of methods are shown in Table 7.

Few managers cited improvements that might be needed in this business analysis, but there was a call for more multidisciplinary, multidepartmental inputs; more market information and input from customers; more time and effort spent on business analysis; and more formal, consistent procedures.

**Table 7. Business/Financial Analysis**

Method	Percent of cases <sup>a</sup>
1. Costs and sales forecast.	31.2
2. Discounted cash flow analysis.	30.5
3. Return-on-investment analysis.	28.0
4. Payback period and/or break-even analysis.	18.3
5. Superficial analysis: informal; “quick and dirty”; rough guesses and estimates.	14.0

<sup>a</sup>Adds to more than 100% due to multiple techniques used.

<sup>4</sup>Canadian-based firms were the sample; hence, “nearby trading areas” means the U.S. market.

*Product Development*

Product development—the actual design and development of the product—was perceived by managers as a well-handled activity, on average. There were no specific or unusual techniques uncovered here. However, there were suggestions for improvement.

- A more formally laid-out process, with better coordination among people and departments.
- More depth and detail regarding technical issues/problems/questions during development.
- More resources required: more and more experienced people; better facilities.
- More time and effort to be spent.

*Product Testing—In-House*

Following product development, the product was typically subjected to a set of in-house tests (88.9% of cases). This stage was rated as the strongest one, on average. The most common approaches to product testing included those listed in Table 8. Requested improvements included more time and effort to be spent on testing, and a more detailed, formal, and rigorous testing procedure.

*Product Testing with the Customer*

This was a fairly well-rated activity and one that was undertaken in the majority of projects studied (66.3%

**Table 8. In-House Testing**

Approach	Percent of cases
1. Prototype testing: to determine if the product functioned properly and reliably.	32.5
2. Operating tests: tests to check the functionality/reliability of the product under real-life working conditions.	28.5
3. Specifications check: tests and checks to determine if the product met specifications, outside design standards, etc.	26.2
4. Field tests of the product.	7.1

**Table 9. Test Market/Trial Sell**

Approach	Percent of projects
1. Selling the product to a sample of selected customers only.	48.4
2. Selling the product in a limited/specific geographic area only.	32.2

of cases). Most often, the customer test involved giving a sample or prototype of the product to the customer at no charge and letting the customer try the product (77.9% of customer tests). In a minority of projects (14.2%), there was a rigorously designed customer test, complete with written testing procedures. In a few projects (7.1%), the customer was brought to the company’s premises for an on-site user test of the product.

Improvements mentioned included a more thorough testing program (more tests undertaken at more test sites and at more representative sites) and better control over the customer tests.

*Test Market/Trial Sell*

This activity was undertaken least frequently of all 13 activities in the process: Only 22.5% of projects featured a trial sell/test market. But, when undertaken, this step was proficiently executed. Typically, a trial sell involved the approaches given in Table 9.

Trade shows and reduced price/rental schemes were also employed to provide a trial sell of the product. Few improvements were recommended here, but these included better/sharper definition of the test market customers and more objective and better measures of the test market results.

*Trial Production*

Trial production was carried out in less than half the projects but, when undertaken, was rated proficiently. The two focuses typical to a trial production are shown in Table 10.

Improvements requested here were few but included better training of production employees, better control over the production system, and better coordination among departments and people. More feedback and better measures were also suggested.

**Table 10. Trial Production**

Focus	Percent of projects
1. A test of the production system itself (e.g., that production equipment ran properly).	53.7
2. A test of the integrity of the product that the production system yielded (e.g., to see that the resulting product specs were met).	41.8

*Precommercialization Business Analysis*

Managers were queried about whether or not a detailed business analysis was undertaken after product development, but before full launch. Only a minority of projects (34.8%) featured such an analysis; but typically, if carried out, it was handled proficiently. The methods used for the final “go/no go” decision are listed in Table 11. Suggestions on how to make this final go/no go decision more effective included a total “start-from-scratch” review; revision and update of all data; and better market information, including inputs from a market acceptance or test market study.

*Production Start-up*

In the majority of cases, production start-up was a relatively straightforward activity. It was recognized as a distinct stage in 56% of the projects and was rated fairly proficiently. It involved either no changes to the existing production facilities (12.5% of cases) or few changes (35.0% of projects). In 31.3% of the projects, production start-up meant acquisition and commissioning of significantly new equipment and production facilities and, in a few cases, a new factory. Extraordinary quality control checks for start-up were implemented in only 7.5% of the projects.

**Table 11. Precommercialization Business Analysis**

Methods	Percent of cases
1. A detailed financial analysis, involving a return or profitability assessment.	34.8
2. A review/integration of marketing information only: sales forecasts and marketing cost projections.	23.9
3. A cost review: a review of distribution, production and marketing costs.	19.6

**Table 12. Market Launch**

Approach	Percent of cases
1. Trade literature, trade shows, and trade advertising but no special promotion or training for the sales force.	35.8
2. Trade literature, trade shows, and trade advertising plus a strong sales force promotional effort: demonstrations, conferences, and seminars for customers.	20.8
3. Trade literature, trade shows, and trade advertising plus special training for the sales force.	20.8
4. Very limited efforts: virtually nothing special done for the launch.	17.0

A variety of improvements in this phase of the process were suggested: better coordination; better management; more detailed documentation and procedures; and more resources, namely time, money, and qualified people.

*Market Launch*

The launch stage was rated moderately positively on average. Surprisingly, in over 30% of the projects, the launch stage was not formally recognized as a distinct and identifiable stage or activity.

The projects were all industrial products, and launch efforts were limited to those listed in Table 12.

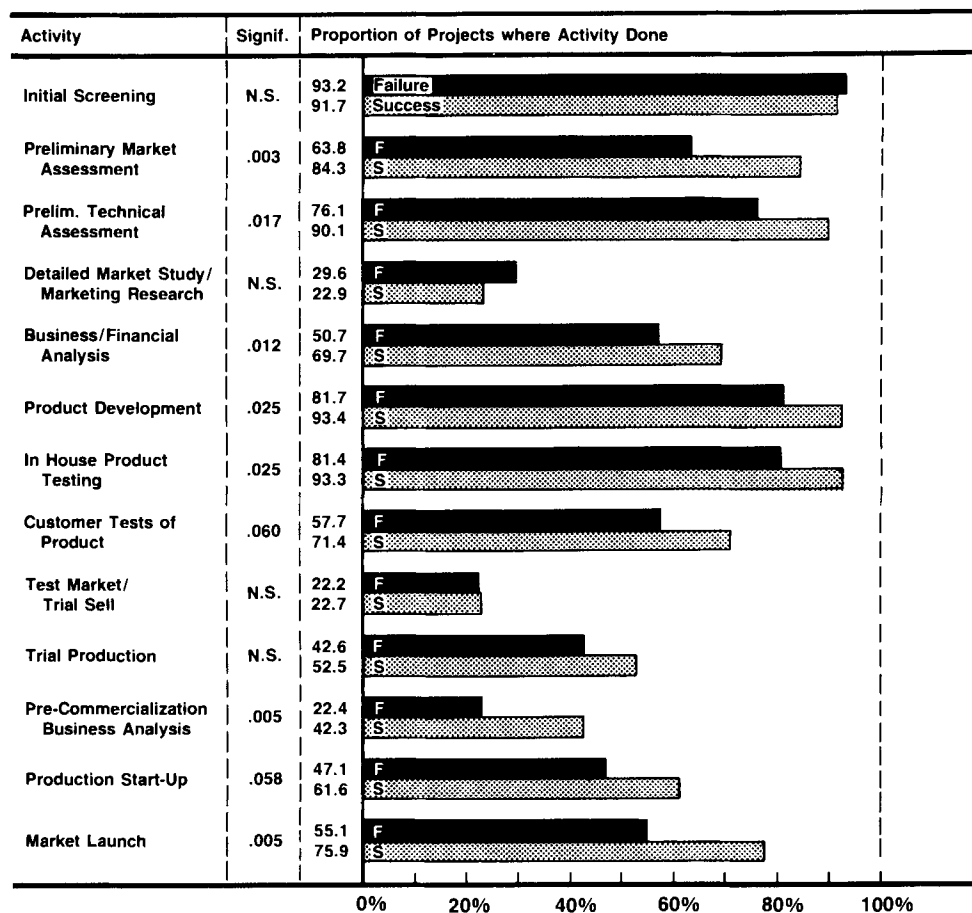
Numerous possible improvements were identified for the launch. These included the following:

- More resources and effort to be allocated to the advertising and promotion effort for the new product.
- A clearer definition of marketing objectives.
- Better in-house coordination among the sales, advertising, service, and production departments.
- Better training and preparation of the sales force.

**Impact on Success**

The results thus far have yielded an insight into the strengths and weaknesses of the new product process.

**Exhibit 5. Frequency of Activities: Successful Products Versus Failures<sup>a</sup>**



<sup>a</sup>Shaded bars show significant differences between successful and unsuccessful products. Signif. indicates level of significance, based on two-tail t-test.

But the question remains, how important are each of these activities? And to what extent does new product success hinge on carrying out specific activities well? Exhibits 5, 6, and 7 provide these answers.

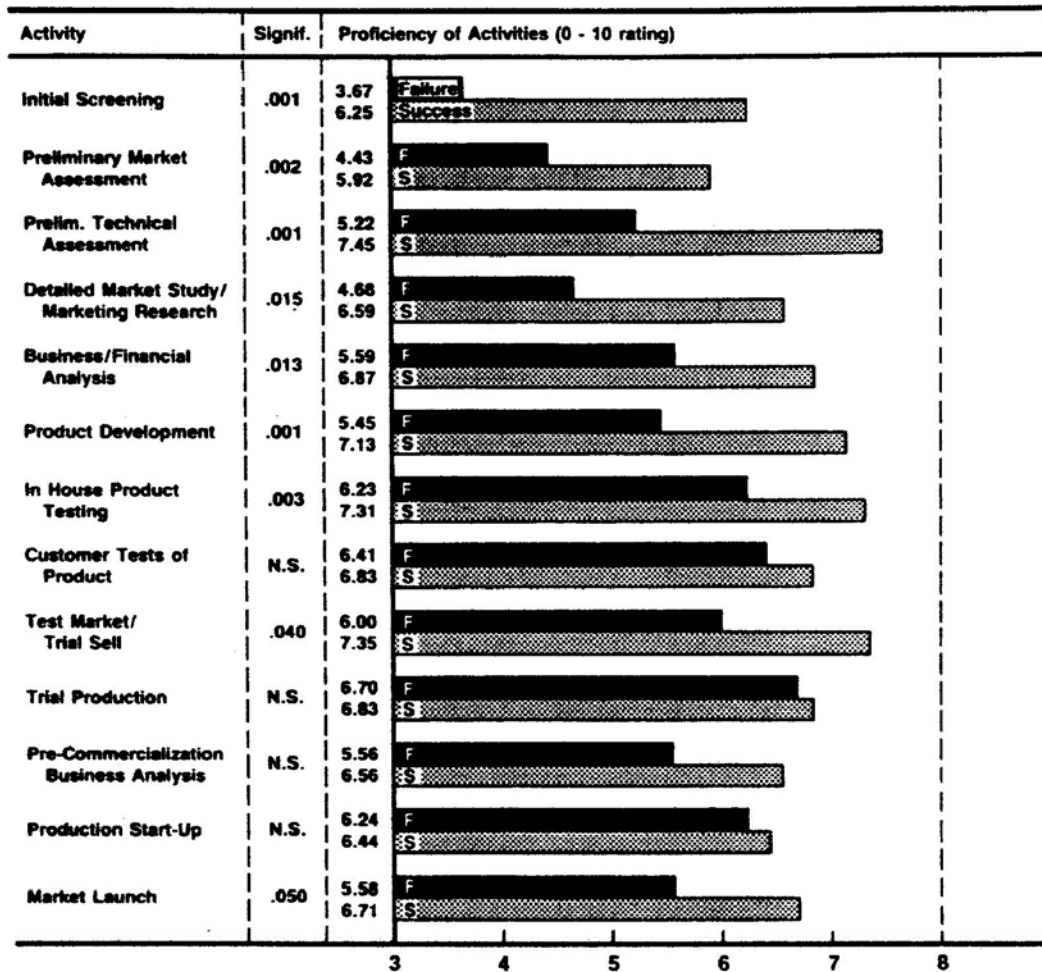
The completeness of the new product process—whether an activity was carried out or not—is strongly linked to project outcomes. Exhibit 5 shows the frequency of activities for successful projects versus unsuccessful ones. For certain activities, there were significant differences.

- Preliminary market assessment and the formal market launch stage were much more prevalent in successful projects than in the failures. These two activities showed the most significant differences between successes and failures.
- Some activities, such as test markets and the detailed market study, were done so infrequently that no meaningful differences between successes and failures could be detected.

- Whether or not an activity was part of the new product process was significantly related to project outcomes for 9 of the 13 activities. Successful projects consistently featured a higher frequency of these nine activities (see Exhibit 5).

Finally, when one looks at the completeness of the new product process (i.e., how many activities were carried out), successful projects featured significantly more activities—a much more complete process—than did failures (two-tail t-test, 0.003 level). A more detailed analysis revealed that only 38.2% of all failure projects featured nine or more activities. In contrast, 54.8% of successes had nine or more activities. Further, nearly one quarter (23.6%) of all failures had five or less activities completed compared to only 4.8% of successes. (These latter differences were significant at the 0.003 level, Chi-square test.) In short, a more complete new product process appears to make a difference.

How proficiently these activities were undertaken

**Exhibit 6. Proficiencies of Activities Success Versus Failure<sup>a</sup>**

<sup>a</sup>Shaded bars show significant differences between successful and unsuccessful products. Signif. indicates level of significance, based on two-tail t-test.

was also strongly tied to project outcomes. Exhibit 6 shows the mean proficiency ratings for successful versus unsuccessful products; following are some highlights:

- Three of the activities were strongly related to project outcomes. That is, in successful projects, the activity tended to be significantly more proficiently undertaken. These three activities were
  - initial screening;
  - preliminary technical assessment;
  - product development.
- Another six activities were also significantly related to project outcomes: The activity was much better handled in successful projects. These six activities were
  - preliminary market assessment;
  - market research/detailed market study;
  - business/financial analysis;

- in-house product tests;
- test market/trial sell;
- market launch.

Although causality cannot be demonstrated here, there appears to be a strong link between project outcomes (success or failure) and doing certain activities and doing them well.

How consistent are these relationships between project outcomes and activities? Success and failure can be measured in a number of ways, and the particular measure used might affect the outcome-activity link. In order to check the applicability of the results, four different measures of new product performance were considered:

1. An overall project profitability rating on a 0 to 10 scale (from “fell far short of our minimum acceptable profitability level” to “far exceeded our minimum acceptable profitability level”).

**Exhibit 7. Proficiencies of Activities: How They Impact on Performance**

Activities	Overall success rate		Payback period <sup>a</sup>		Mkt. share (domestic)		Mkt. share (foreign)	
	<i>r</i>	signif.	<i>r</i>	signif.	<i>r</i>	signif.	<i>r</i>	signif.
Initial screening	0.41 <sup>b</sup>	0.001	0.33	0.001	0.34	0.001	0.29	0.001
Preliminary market assessment	0.31	0.001	0.22	0.006	0.24	0.001	0.25	0.002
Preliminary technical assessment	0.16	0.03	0.17	0.02		NS		NS
Detailed market study/marketing research	0.41	0.001	0.24	0.06	0.18	0.10	0.41	0.003
Business/financial analysis	0.33	0.001	0.17	0.04	0.26	0.004		NS
Product development	0.32	0.001	0.27	0.001	0.10	0.10		NS
In-house product testing	0.30	0.001	0.27	0.001		NS		NS
Customer tests of products		NS		NS		NS		NS
Test market/trial sell	0.28	0.05	0.35	0.02	0.43	0.005	0.25	0.07
Trial production	0.14	0.10	0.21	0.03	0.20	0.03		NS
Precommercialization business analysis		NS		NS		NS		NS
Production start-up	0.15	0.08		NS		NS		NS
Market launch	0.26	0.002	0.28	0.001	0.20	0.01		NS

<sup>a</sup>Signs of correlations with paybacks were all negative (not shown): the more proficient the activity, the shorter the payback period.

<sup>b</sup>When undertaken, the proficiency of screening was positively correlated ( $r = 0.41$ ) with the rated success of the project.

2. The payback period of the project (measured in years).
3. The domestic market share.
4. The foreign market share (averaged over the principal target market countries).

The proficiency rating of each activity was then related to each of these four measures of success (Pearson correlation coefficients; see Exhibit 7); following are some highlights:

- How well certain activities were undertaken and new product performance was strongly and positively related, regardless of the gauge of performance used.
- Certain activities stood out as particularly key, however. These were
  - initial screening;
  - preliminary market assessment;
  - detailed market study/market research;
  - business/financial analysis;
  - product development;
  - in-house product tests;
  - market launch.

Many of these are up front or predevelopment activities.

- Only the proficiencies of precommercial business analysis and customer tests of the product were uncorrelated with project outcomes (although the frequency of both activities indeed was linked to outcomes [see Exhibit 5]).
- Profitability measures—overall profitability and the payback period—appeared more directly explained by the new product process activities than were the market share measures.

Finally, the completeness of the new product process was also significantly tied to several of these measures of success. More successful projects—based on the overall success rating and the payback period—clearly featured a more complete process, that is, a larger number of process activities (Anova's with Duncan multiple range tests).

Before moving into a discussion of the implications of the study, the reader should be aware of the limitations of the research. First, the population of firms studied was in Canada. All firms were industrial product manufacturers known to be active in the field of product development. Although many of the firms were multinational (U.S. or European), one cannot directly generalize the results to other countries. Second, because not all firms in the original sample agreed to participate, the final sample of 123 firms is not totally

representative; however, a response rate of 62% is certainly respectable and suggests a fairly relevant sample. Questions of data reliability and validity are also an issue. Special care was taken to ensure that the appropriate person in each firm was interviewed; in many cases, two or three managers sat in on the interview. The questionnaire itself had been pretested. Finally, there was no evidence of managers deliberately concealing, biasing, or falsifying answers: managers cooperated fully and appeared to respond to the questions to the best of their abilities.

## Summary and Implications

This research has provided a glimpse into what happens during the new product process and into how decisive the activities that make up process are in determining project outcomes. The overriding finding of the investigation is that new product success is closely linked to what activities are carried out in the new product process, how well they are executed, and the completeness of the process. That is, people—and not solely the nature of the market, the type of technology, or even the synergy or fit between the project and the firm—doing tasks and, most importantly, people doing them well contribute strongly to new product success. Markets, technology, synergy, and other factors all enter the success equation, as other studies have found [5–7, 11, 14–16]; however, the outcomes of the new product project are also very much in the hands of the men and women who move the project from idea to launch.

A second general conclusion is that the new product process is deficient in many companies. Although many managers profess to have a systematic process plan in place, an audit of what actually happens “in the trenches” reveals many gaps and deficiencies. A number of activities, often critical activities, are omitted altogether, and other key activities are superficially or weakly undertaken.

The most glaring deficiencies—activities that were often overlooked or weakly handled, yet were strongly linked to product success—appear in Table 13.

There are a number of action implications from the results of the investigation:

1. *A new product process model.* The critical nature of the majority of the activities of the process, com-

**Table 13. Deficiencies**

Activity	Comment
Detailed market study/market research	Omitted altogether in 74.6% of the projects; rated weakly when done, yet significantly correlated with all four measures of project performance.
Initial screening	Very weakly undertaken, particularly in failure projects; strongly correlated with all four measures of project performance.
Preliminary market assessment	Omitted in 23.3% of the projects; very weakly rated overall, yet strongly correlated with all four measures of project performance.

binced with the major gaps and deficiencies uncovered, point strongly to the need for a standard activity plan—a new product process model. Such a flow model charts the activities that should or must be undertaken as a new product project moves from the idea stage to launch. Although such a model will be tailored to the needs of each firm and project, a good place to begin is with the list of activities described in this study (see, e.g., Cooper [3]) By having such a model, or “blueprint for action,” in place, the hope is that there will be fewer instances where critical activities are omitted or where insufficient time and resources are allocated to particular activities [3]. Although the addition of activities is clearly no guarantee of success, the omission of steps should be made by conscious decision, not by oversight.

2. *A need for discipline.* Having a process model in place is only half the battle. Adhering to the model in a disciplined fashion is the second half. Even in those firms that claimed to have a system or model in place, the comment was often made, “We do many of the (desirable) activities in most of our projects; what we lack is consistency.” The appropriate activity or process model, once designed, must be adhered to. For example, there are good and valid reasons why virtually every new product process model features a formal screening stage, a detailed market study, and a test market or trial sell step. Arbitrarily deciding to omit key steps—breaking discipline—can spell disaster, as many of the firms in this study discovered.

3. *More time, effort, and resources.* One of the recurring themes that emerged from the study was that more time, money, and manpower should be allocated to certain activities in the new product process. What is the point of implementing a process model if there aren't the resources required to carry out the activities that comprise the model! To make such a process model work, there must be commitment—not just in words, but in terms of resources. The standard rebuttal is, "We can't afford it." Our response is, "Given the importance of new products, the amounts at stake, and the high likelihood of failure, you can't afford not to commit the resources to these critical activities."
4. *More focus on certain key activities.* Certain activities were singled out as particularly weak ones yet were strongly associated with success. These activities must be built into the new product process. And special attention must be paid these activities to ensure that they are carried out well. These flagged activities include
- market studies:* to determine market size; competitive situation; customer needs, wants, and preferences; and customer reaction to the proposed product or product concept.
  - initial screening:* a formal go/no go decision point very early in the new product process, involving multidisciplinary, multifunctional inputs and preferably based on a written checklist of criteria.
  - preliminary market assessment:* an early and relatively simple, nonscientific market appraisal, checking out the market validity of the proposed product.

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## Conclusion

New product success can never be guaranteed, but given the payoffs of a successful product innovation

program, there is certainly ample justification for directing more attention to the way we conceive, develop, and commercialize new products. This investigation has focused on the activities that comprise the new product process. By shedding light on the strengths and weaknesses of the process, the hope is that managers will become better atuned to the need to implement a disciplined new product process, backed by the needed resources to carry out the key activities.

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