

## New Product Development Process Used in the Consumer Product Manufacturing Units in Nepal

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### ABSTRACT

This study focuses the technical process steps for new product development used in the manufacturing units and indicates that feasibility report preparation practice is regular in the consumer product industry. Consultants are used to develop new products. Top level, line managers, and food technicians are the main decision taking, supervising, and controlling authorities in the product development process. Consultants and market are the main sources of new product ideas. Joint meeting among research and development (R&D), production and marketing staff and inter-communication system are perceived to be useful for co-ordination of activities.

**IN TODAY'S GLOBALLY COMPETITIVE** world, successful new product planning and development is a challenge to the industry. It is a creative function within a business organization. Modern concept of new product planning and development is the involvement of multi-disciplinary team from idea generation to commercialization. In Nepal, competition is increasing day by day. Many products of same use are available in the market. Product failure rate is also increasing. Many products are partially successful. In this context, this article focuses the technical processes followed for new product development in Nepal.

### 1. Study Methods

The study is based on a descriptive (survey cum analytical) research design. Case study approach was followed on different consumer products. It is based on a field survey through questionnaire administration and personal interview. The study covered 32 products from 18 manufacturing units (10 soap, 8 biscuit, 6 noodles, 5 cigarettes, and 3 cold drinks). Sources of information are mainly 18 line managers and 13 top-level management personnel. The line managers represent 32 new products and the top management represents 23 new products.

### 2. The Theory

Rapidly changing technologies and customer requirement are producing shorter product life cycle, which in turn compels organizations to shorten product development cycle times (LaBahn, Ali & Krapfel 1996). Inter-organizational communication relating to innovation is essential to the commercial success of new products, which depend on information change about the market and resources availability to make accurate decisions regarding product development. Many companies have reorganized new product development responsibilities into inter functional team efforts, instead of relying solely on a R & D unit. In the hopes of strengthening the information exchange processes organizational management can also encourage the process of inter-functional communication by establishing formalized rules and procedures for communication and interaction (Song, Neeley and Zhao 1996).

Problems associated with developing products with networks are also introduced. They are: integration of marketing and R & D, performance of the predevelopment activities,

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resources allocated to the actual development activities, testing prototypes with users, timing of the launch, use of the names and reputations of the users during market launch, co-operation between industrial firms and universities and specific problems of small firms (Cooper 1996). Inter-functional co-ordination can create problems of its own, however, as organizations attempt to bring together people with differing characteristics and expertise in the pursuit of unified goal. The need for effective interventional co-ordination in new product development has led to the examination of internal and external factors that effect cross-functional interface (Song, Neeley and Zhao 1996).

Development plan for new products are frequently designed around establishing a market which in the long-run will have a favorable impact on the firms' profitability (Eddy and others 1993). Originally, it was argued that dominant, as compared with non-dominant firms, would be better able to successfully implant the outputs of the development process into their relatively being competitive environments (Droge and Calantone 1996).

Innovation process is divided in five generation, which represents a more comprehensive process of the electrification of innovation across the whole innovation system. The characteristics of first-generation innovation process (1950s-Mid 1960s) is greater overall organizational and systems integration (including external networking) the second-generation (Mid 1960s-Early 1970s) is covered with flatter and more flexible organizational structures, including developed decision making, the third-generation (Early 1970s-mid 1980s) relates with fully development internal data bases, the fourth-generation (Early 1980s-Early 1990s) shows electronically assisted product development and, fifth-generation is now characterized by effective external electronic linkages (Rothwell 1994). Japanese companies are seen more efficient than U.S. companies in innovation process.

New product development process activities and description are as follows:

**Idea Screening:** The initial go/no go decision where it was first decided to allocate funds to the proposed new product idea.

**Preliminary Market Assessment:** An initial quick look at the market.

**Preliminary Technical Assessment:** A quick assessment of the technical merits and difficulties of the project.

**Detailed Market Study/Market Research:** Marketing research, involving reasonable sample of the respondents, a formal design, and consistent data collection procedure.

**Business/Financial Analysis:** A financial or business analysis leading to a go/no go decision prior to product development.

**Product Development:** The actual design and development resulting in, e.g. a final product.

**Process:** Process (Procedures) design and testing.

**System Design & Testing:** Systems are properly debugged.

**Personnel Training:** All involved personnel are trained, e.g. training materials are prepared, and people are trained in how to use and sell the new product.

**Test Market/Trial Sell:** A test market trial sell is conducted to limited or test set of customers to test the plan for full launch.

**Full-scale Launch:** The launch of the product, on a full-scale and/or commercial basis: an identifiable set of marketing activities.

**Post Launch Review & Analysis:** Conduct a review and analysis after the new product is fully launched (Edgett 1996).

High quality new product process was the strongest common denominator among high performance business (Cooper 1996). An overhaul of the product innovation process in one solution to what aids so many firms' new product efforts. To improve new product success

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rates companies are redesigning their new product processes and increasingly looking to "stage-gate system" which is a blue print to manage, direct and control their product innovation efforts. That is, they have developed a systematic process, a blue print, or road-map-for moving a new product project through the various stages and steps from idea to launch (Cooper 1996).

Stage-gate systems break the new product project into discrete and identifiable stage. Each stage is designed to gather information needed to progress the project to the next gate or decision point. Each stage is multi-or cross-functional. Each stage consists of a set of parallel activities undertaken by people from different functional areas within the firm and they are working together as a team and lead by a project team leader. A generic stage-gate new product process is also called a funneling approach, which shows five stages with cross-functional team.

1) Preliminary investigation by core team of technical and marketing team. 2) Detail investigation undertaken by a core team of marketing, technical and manufacturing people. 3) Actual design and development of new product for which sample product is developed and goes in house testing with limited testing. 4) Testing and validation of proposed new product for marketing and production. 5) Full production and market launch, full commercialization of the product. It is the beginning stage of full production and commercial settings.

A task force is formed to implement the stage-gate approach. Their actions include:

- A process audit to identify strengths and weaknesses of the current process
- A retrospective analysis of past new product projects, again seeking areas needing improvement
- Benchmarking other firms and their process
- A review of literature (much has been written on what shape the new product process should take)
- Establishing specs and requirements for the new process-what the process will be and do
- The design of a skeleton of process much like the model
- Seeking feedback form potential users in the company
- The detailed design of process, spelling out stages, activities, gates deliverable, criteria, methods, and procedures and
- The design of a roll-out plan. (Cooper 1996)

The executives seeking to improve their new product development process should consider:

1. A rigorous new product process with high quality execution of the activities in all the process stay can positively influence success.
2. Early upfront marketing activities are essential.
3. Quality of execution is a must.
4. Success is manageable (Edgett 1996).

The firms are changing the way they manage their new product introduction process but they differ greatly on how they do it. U.S. companies have adopted coordinated approach to introduce new product that suggests a carefully orchestrated, strategic human resource policy that few other companies implement. What is more development cycle time reduction, and early manufacturing involvement, has not entered the integrated product development strategy for most domestic firms (Ettlie 1995).

For shortening the product development cycle the following approach can be applied

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by a manager:

1. Be clear about advantage and shortcoming about the development process which is also called be flexible about process.
2. Let economics be your guide or available of financial resources in time help to shorten the time.
3. Watch out for complexity or the degree of complexity determines the effort needed.
4. Manage the invention pipeline or newness or invention must be embraced and managed. Phase of development, limitations of each phase and responsibility of the people involved should be clear.
5. Avoid the "thinking stage" trap or quick thinking of product development start.
6. Staff teams adequately or a team of six to ten full time members will make a quick development.
7. Staff with generalists or staff team with generalists or those willing to become generalists.
8. Let the team manage the team or development speed depends on the speed of the problem solving process.
9. Manage both technical and market risk.
10. Develop a reserve (Smith & Reinertsen 1992).

It is a marketing cliché that you "think globally, act locally". In these terms, global product development is strategic; global product launch is tactical. Think globally means planning and anticipating global need at the very outset of product development process. For global product development regional needs of consumer should understand, should try to make a product more global than it is really is, the multifunctional, multi-geographic teams are empowered to define and bring products to market on a global basis and top management must be committed to actively supporting the global product development process (Graber 1996).

### **3. New Product Development Process Used in Nepal**

Rapid changing technologies and customer requirements are shortening the product life cycle. R&D cannot be ignored for developing new ideas to adjust the changes dynamically. New product success clearly depends to a large extent on the process used for its development and market launch. This section includes the existing practice of R&D, collection of product ideas, use of technical person for new product development, product budget preparation practice, financial resources available, use of steps on product development process, supervision, control and correction/improvement of development process, approaches used to shorten the product development cycle, consideration of environmental factors, goals of new product development, manufacturing process, and product quality.

#### **3.1 Perception of Top Level Management**

Most of the consumer product manufacturing units have product life-cycle extension program as 86.95% top-level management respondents gave positive response to the question. Similarly all (100%) consumer product units are found to have practice of product research.

General manager, new product development committee, managing director, chairman, production manager, marketing manager and food technician, executive committee, president

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and managing director, marketing division and vice-president-marketing are decision taking authority in the sample units for product planning and development activity. Similarly, idea collection sources for new product development in the sampled units are consultants, market phenomena, conceived idea, market study, competitor's product, study and identification of consumer's needs, desires and wants, imported products, international magazine related with product, own idea, external market, internal products, seeing new product new trend, visiting exhibitions, studying product literature, market research report, production manager, consumer's behavior, taste evaluation, consumer opinion survey, supplier ideas, channel, opportunity, new materials, and market feedback and control system.

It is found that most of the consumer product units (91.30%) are found to prepare feasibility report before developing a new product. Because answer is in favor of feasibility report preparation. Information revealed that all the sampled consumer product units use technical person like engineer, consultant, expert etc. to develop the new product. Similarly there is a practice to evaluate the effectiveness of new product development process, because 100% response of top level management is seen positive.

### 3.2 Opinion of Line Manager

There is no R & D section in soap units. Similarly, 67 % in noodles units also viewed that there is no R & D section established. But 88 % in biscuit and 100% in cigarette as well as cold drink units showed that R & D section is established. Thus, consumer product units except soap have established and operated R & D section.

All consumer products (soap 60%, biscuit 88%, noodles 67%, cigarette and cold drink 100%) is found to have practice of inter-organizational and inter-functional communication system of information exchange of marketing of product. In total, 78% are found to have practice of inter-organizational and inter-functional communication system.

There is a practice of joint meeting between R & D, production and marketing staff for co-ordination in soap (60%), biscuit (88%), cigarette (100%), and cold drink (100%). Such practice is found to be partially implemented in noodles (67%). In total, this practice is prevalent in 72% of the sample manufacturing units. Consumer product manufacturing units start to develop their new product in late maturity and early decline stage of product life cycle, because majority of responses is seen in these two stages.

Table 1: New Product Development Starting Stage of Product Life Cycle

S. No.	Product Group	Responses			Total
		Early Maturity	Late Maturity	Early Decline	
1.	Soap	1 (10)	3 (30)	6 (60)	10 (100)
2.	Biscuit	3 (37.50)	2 (25)	3 (37.50)	8 (100)
3.	Noodles	3 (50.0)	2 (33.33)	1 (16.67)	6 (100)
4.	Cigarette	2 (40.0)	3 (60.0)	- (0)	5 (100)
5.	Cold Drink	1 (33.33)	1 (33.33)	1 (33.33)	3 (100)
	Total	10 (31.25)	11 (34.38)	11 (34.38)	32 (100)

Source: Field Survey.

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Financial resources are available moderately (100%) in soap units for new product development. Resources are adequate (50%) as well as moderate (50%) in the biscuit units. But the resources are moderate in noodles units where 50% responses are found and resources are adequate in cigarette and cold drink units where 100% and 67% responses are seen respectively. Similarly, 84% correct the weakness and 16% do not have practice of weakness correction in new product development process used. Table 2 of all sampled consumer product units shows that 75% use all the process steps, 10% do not use some of the steps and 15% use other some steps partially. Thus, conclusion is that most of the given new product development process steps are seen used in consumer product manufacturing units.

Table 2: Use of New Product Development Technical Process Steps

S.No.	Process Steps	Responses			Total
		Yes	No.	Partial	
a.	Idea generation	30 (93.75)	- (0)	2 (6.25)	32 (100)
b.	Initial screen of idea	24 (75)	3 (9.37)	5 (15.62)	32 (100)
c.	Preliminary technical assessment	24 (75)	- (0)	8 (25)	32 (100)
d.	Detailed market research	23 (71.87)	7 (21.87)	2 (6.25)	32 (100)
e.	Business/financial analysis	22 (68.75)	3 (9.37)	7 (21.87)	32 (100)
f.	Product development	26 (81.25)	- (0)	6 (18.75)	32 (100)
g.	In-house product testing	23 (71.88)	5 (15.62)	4 (12.50)	32 (100)
h.	Customer test of product	24 (75)	2 (6.25)	6 (18.75)	32 (100)
i.	Test market/trial sales	22 (68.75)	6 (18.75)	4 (12.50)	32 (100)
j.	Trial production	27 (94.37)	3 (9.37)	2 (6.25)	32 (100)
k.	Pre-commercialization business analysis	16 (50)	9 (28.12)	7 (21.87)	32 (100)
l.	Production start-up	23 (71.88)	2 (6.25)	7 (21.87)	32 (100)
m.	Market launch/commercialization	28 (87.50)	- (0)	4 (12.50)	32 (100)
	Total	312 (75)	40 (9.62)	64 (15.38)	416 (100)

Source: Field Survey.

Biscuits (63%), cigarette (100%) and cold drink (67%), units use stage-gate system for new product development, but soap (70%) and noodles (100%) do not use stage-gate system. Thus, stage-gate system for new product development is partially used in consumer product units. Most of the consumer product units (84%) prepare product budget. Only 16% do not prepare the budget. Thus, major consumer product manufacturing units prepare product budget. And 69% are positive and 31% are negative regarding the preparation of financial statement by consumer product units.

Most of the consumer product units (81%) have new product strategy on introductory and recovery stage of product life cycle. This strategy is seen partial in soap units where 60% responses are positive and 40% are negative. Rest of other sampled units have 83% to 100% positive response with regards to new product strategy on introductory and recovery stage.

#### **4. Results and Implications**

The new product development processes in Nepal is traditional just like a relay race. The manufacturing units have to form multidisciplinary team who create effective strategy before implementing the plan or program. Conclusions derived from the study and implications forwarded are as follows:

1. Many manufacturing units have product research practice. Most of them prepare feasibility report before developing a new product. Technical persons like consultants, engineers, experts etc. are being used to develop new products and most of the manufacturing units have product life cycle extension program. It must be considered to extend the life cycle.
2. General manager, product development committee, managing director, chairman, production manager, marketing manager, food technician etc. are the main decision-taking, supervising and controlling authorities in different industries for product planning and development activities. There is also the evaluation practice of the new product development process. But it should be deeply analyzed.
3. Main sources for collecting new product ideas are: consultants, market phenomena, market study, conceived idea, competitor's product study and identification of consumers needs, desires and wants, imported products, journal and magazine related to products, visiting exhibitions, study of product literature, production manager, taste evaluation, supplier idea, market feedback and control etc.
4. Main considerations for new product development are: consumer demand, quality of product, consumer needs and wants, purchasing power of people, performance, behavior, taste, habits etc. of consumer, impact of imported and multi-national company's product, population, consumer acceptability, packaging quality and design, price, promotion, technical know how, brand name, competitor, consumer satisfaction, cost-benefit analysis, consumer affordability etc.
5. Research and development unit is found to exist in all the firms except to the soap manufacturing unit. . But all the units should establish research and development section. The marketing managers believe on product life cycle and views that new product development should start in late maturity or early decline stage of product life cycle in existing units. There is practice of joint meeting of R & D, production and marketing department staff to coordinate their activities. Such meeting must be fully practiced and coordinated.
6. Firms also have the practice of inter-organizational and inter-functional communication

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system of information exchange of marketing of product. All the manufacturing units should establish communication system for effective marketing information exchange. Product planners are getting financial resources at a satisfactory level. But the resources are not seen as per the needs in the noodles industry but it should be adequate in all the manufacturing units for effective product development.

7. Most of the given technical process steps for new product development are in use while developing the new products. The use of required steps is seen partial. Deep and detail analysis and implementation of new product development process are lacking. The modern steps for new product process should be used fully in all manufacturing units. Modern holistic approach should be followed to implement process steps. Besides this, weakness correction of the process steps is also seen in practice. Similarly, the manufacturing units are found to consider all the technical steps to improve the new product development process. Managers also consider the manufacturing process and product quality in managing the new products. Consideration level of goals of new product development process as well as other factors relating to improve new product development process should be increased. There should be analytical feedback system to correct the weakness of the development process. Existing correction practice of weakness is not satisfactory.
8. Marketing managers use most of the given approaches for shortening the product development cycle. Use of degree of complexity of development and staff with generalist approaches to shorten the product development cycle is weak. Stage-gate system for new product development is in partial practice.
9. It should be practiced fully. Most of the units prepare product budget. Most of them prepare financial statements relating to new products. Many units have new product strategy during introductory and recovery stage of the product life cycle. But used strategy is weak. It must be effective to gain the market share. Every firm should have program to extend product life cycle and the marketing manager must be aware on the appropriate stage of product life cycle to start new product development in existing manufacturing units. Product budgeting should be fully practiced.

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