The Role of Information Technology in New Product Development

Kumkum Sinha*
Nilopher Shaikh**

Abstract

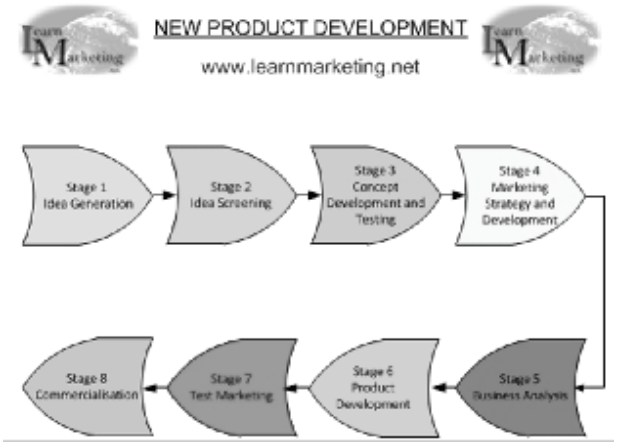
In order to achieve a successful new product, and certainly the successful implementation of a new product into a company, it is necessary to have a structured and documented approach to New Product Development (NPD), therefore providing a clear roadmap for the development of new products. This review highlights the NPD process, from concept to consumer, in order for a company to succeed and use new products as a source for competitive advantage. Despite various sophisticated methods and high investments, new products still face notoriously high failure rates. A very critical stage in new product development is product concept testing for the go/no-go/kill decision in further product development. Since there is a high number of a different product concept to test, there obviously is a need for a reliable, valid and efficient method, which can benefit from the scalability and interactivity of Internet-based technologies. Internet-based information markets are a new method to support new product development, based on the market efficiency hypothesis. In today's technology-fueled business environment, the always-important speed to market factor has become perhaps the most critical factor in new product development. Today, however, speed to market is perhaps the most crucial part of product development. Improved communication (especially the Internet), increased globalization, and rapid changes in technology have put tremendous pressure on companies to get their product to market first. To improve speed to market, a company should first make sure that it is making the best possible use of available technology. If it is, then there are other steps that can be taken to speed product development through efficient, market-oriented product planning that takes the customer into account. We further, compare the results of the information markets with traditional research methods. This paper describes the nature and application of internet to an important marketing process. It offers the potential of improving the success of new products in the market place reducing significant waste.

Introduction

In business and engineering, N**ew Product Development** (NPD) is the complete process of bringing a new product into the market. A product is a set of benefits offered for exchange and can be tangible (that is, something physical you can touch) or intangible (like a service, experience, or belief). There are two parallel paths involved in the NPD process: one involves the idea generation, product design and detail engineering; the other involves market research and marketing analysis. Companies typically see new product development as the first stage in generating and commercializing new product within the overall strategic process of product life cycle management used to maintain or grow their market share.

New Product Development (NPD)

Improving and updating product lines is crucial for the success for any organization. Failure for an organization to change could result in a decline in sales and with competitors racing ahead. The process of NPD is crucial within an organization. Products go through the stages of their lifecycle and will eventually have to be replaced. New product development has eight stages.. These stages will be discussed briefly below:



Stage 1: Idea Generation

New product ideas have to come from somewhere. But where do organizations get their ideas for NPD?

*Assistant Professor, Pioneer Institute of Professional Studies, Indore
**Student, Pioneer Institute of Professional Studies, Indore

Sources include:

- Market Research
- Employees
- Consultants
- Customers
- Competitors
- Distributors and supplier

Stage 2: Idea Screening

This process involves shifting through the ideas generated above and selecting ones which are feasible and workable to develop. Pursing non feasible ideas can clearly be costly for the company.

Stage 3: Concept Development and Testing

The organization may have come across what they believe to be a feasible idea, however, the idea needs to be taken to the target audience. What do they think about the idea? Will it be practical and feasible? Will it offer the benefit that the organization hopes it will? or have they overlooked certain issues? Note the idea taken to the target audience is not a working prototype at this stage, it is just a concept.

Stage 4: Marketing Strategy and Development

How will the product/service idea be launched within the market? A proposed marketing strategy will be written laying out the marketing mix strategy of the product, the segmentation, targeting and positioning strategy sales and profits that are expected.

Stage 5: Business Analysis

The company has a great idea, the marketing strategy seems feasible, but will the product be financially worthwhile in the long run? The business analysis stage looks more deeply into the Cash flow the product could generate, what the cost will be, how much market shares the product may achieve and the expected life of the pro3edcewsduct.

Stage 6: Product Development

At this stage the prototype is produced. The prototype will clearly run through all the desired tests, and presented to a selection of people made up of the target market segment to see if changes need to be made.

Stage 7: Test Marketing

Test marketing means testing the product within a specific area. The product will be launched within a particular region so the marketing mix strategy can be monitored and if needed modified before national launch.

Stage 8: Commercialisation

If the test marketing stage has been successful the product will go for national launch. There are certain factors that need to be taken into account before a product is launched nationally. These include:

- Timing of the launch,
- How the product will be launched,
- Where the product will be launched,
- Will there be a national roll out or
- Will it be region by region?

Importance (New Product Development)

- The importance of New Product Development is a result of the necessity for developing new products if a business is to survive.
- New product development is tied to the ability of a business to remain competitive and also to the longevity of such a business.
- Business is all about innovation and change, making it absolutely necessary for businesses to adapt to those changes in order to remain relevant.
- New product development may be geared toward the conceptualization of a new idea regarding a completely new line of products currently not in the market, or it could be aimed toward upgrading products that may be in the market already.

Opportunities of the Internet for New Product Development

Brockhoff (1999) proposes to distinguish five stages of the new product development process, namely (i) idea generation and screening, (ii) development of product concepts, (iii) research & development, design and engineering of product prototypes, (iv) product testing and (v) product launch. Others share this point of view (Urban and Hauser 1993, Dahan and Hauser 2002). Therefore, we use these five stages to structure the different ideas that have been proposed to support new product development (see **Figure 1**).

Benefits of Internet Marketing in Relation to Product Development

There are many benefits of internet marketing and they can be used by businesses for a number of different things. Internet marketing can also be used in relation

Opportunities of The Internet to Support Stages of New Product Development

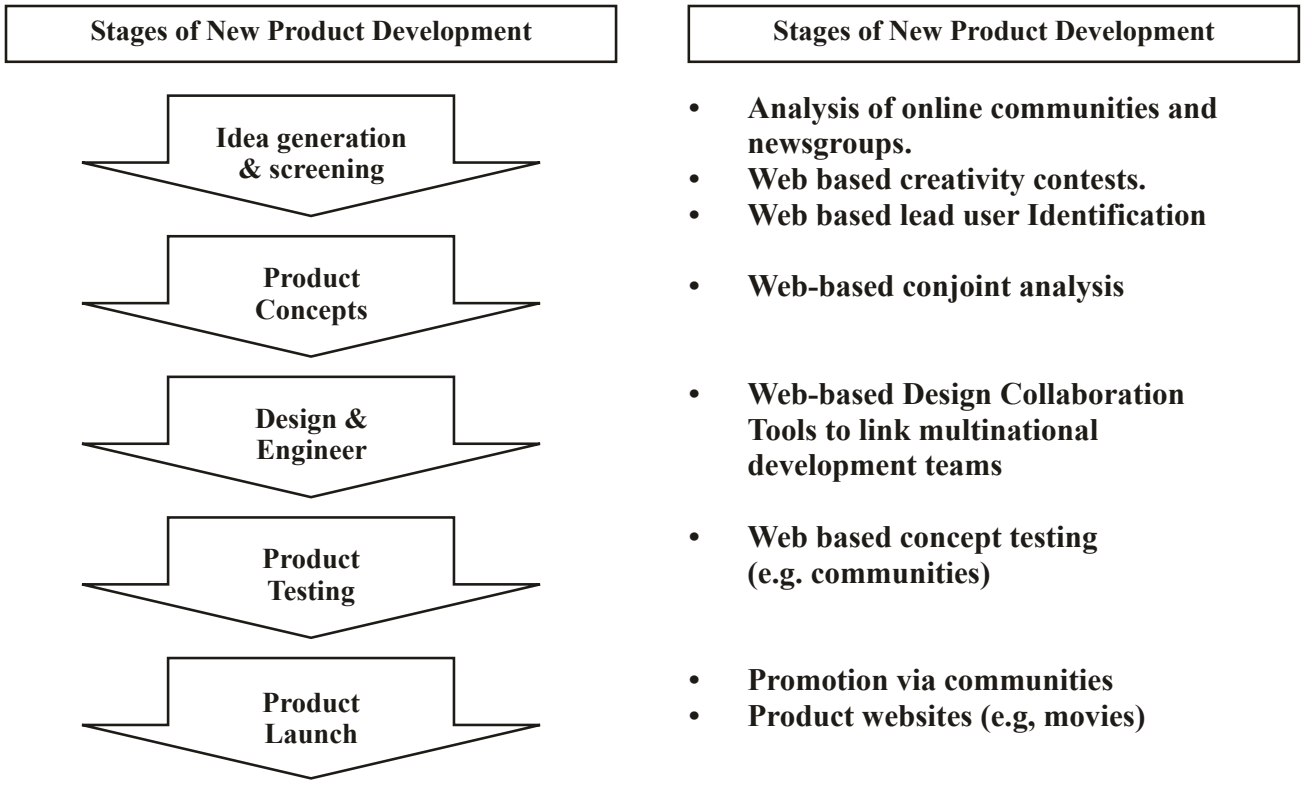


Figure 1 provides an overview of the opportunities of the Internet to support new product development. The idea generation and screening stage can be supported in several ways by the Internet. Online communities and newsgroups can be systematically analyzed for new product ideas. In addition, creativity and idea generation contests can be easily organized via the Internet (Ernst et al. 2004). Thereby or in connection with an online survey, a company can try to identify lead users, which it can then use as a source for new product ideas (Urban and Von Hippel 1988, Brockhoff 2000). In the product concept stage, consumer preferences for different new product concepts can be evaluated via web-based preference elicitation tools such as conjoint analysis. Thereby, the presentation of new product concepts as well as the preference elicitation method can be conducted completely online, saving time and money, as well as making use of the graphic and audio capabilities of the world wide web to depict virtual products and product features ((Dahan and Hauser 2002, Dahan and Srinivasan 2000, Ernst and Sattler 2000). In addition, the computational capabilities of the Internet allow

to dynamically adapt web-pages in real time (Toubia et al. 2003). Web-based design collaboration tools, such as computer aided design (CAD) and computer aided manufacturing (CAM), linked to a company's knowledge management system, can support interaction between multi-regional and multi-national R&D teams. Further, such tools and online communities in a company intranet as part of its knowledge management system can enhance collaboration between different departments engaged in the design and engineering stage of the new product development process (Grover and Davenport 2001). Product prototypes can be tested among an online community as part of the product testing stage (Panten et al. 2001). Web-based preference elicitation tools can be applied at this stage as well. The launch of a product can be supported by specific product websites (e.g. for movies), which inform consumers about the product and thereby help to reduce buyer uncertainty for fairly new products. Further, new products can be promoted via online communities and newsgroups (Albers et al. 1998). In addition, product placements in online games can provide a new opportunity to promote products.

to product development (improving an existing product or developing new kinds of products), and there are many benefits that follow up with this. For instance, internet marketing gives an organization many different sources that they can use in their process of product development. This will then make things easier for them as they are already supplied with necessary sources, which saves time for the organization.

Different sources will be extremely valuable and will allow the organization to make good use of them so the product they are making developments to or the new product they are developing will be very successful in the market. Internet marketing allows an organization to do their own research about anything that going on in the market, and they can find a lot about customers and what sort of products are mostly famous at this point of time, so while they are doing their product development they can use all the information they have found out and apply it in ways that will be beneficial for them. Viral marketing is when a marketing message is sent by email to existing customers or to a target group, which is then forwarded by them to their friends, This cycle keeps going on and on and more people are being informed each time unknowingly promoting the business. This is a benefit to product development because when organizations are making certain developments to an existing product or when they are developing a fresh new idea to form a brand new product, they can use viral marketing to inform all their customers about their new product that coming into the market. Customers will be informed about the launch of the product and since they were sent an email, they can always forward it to other people in their contacts and inform them to. The organization will be getting free promotion this way and more people will be informed about the new product. This is a major benefit in relation to product development. ASOS use this type of method as they also send emails to their customers informing them about anything new that happening to their business or about new products that are now available for customers to buy. This way ASOS use internet marketing in relation to product development. Another benefit of internet marketing in relation to product development is giving feedback. The way this is beneficial is that customers have the right to give a business their personal feedback to them about their products or their services they are providing.

By giving feedback customers are telling businesses what they think is good about their products and what can be improved. Businesses can then take action and try to use the ideas their customers are giving them in developing their products. ASOS use this technique too as they allow their customers to give their own feedback to them, telling them what they thought about their service and most importantly their products. ASOS can then use this feedback and make certain developments to their products which will attract more customers, increasing sales. Another benefit of internet marketing that can be used for product development by businesses/organizations is very similar to the previous one about giving feedback. However this one differs a bit because it involves social websites that customers can go on to and make conversations about products they found interesting and what they believe should be changed about them, in order to make them better. This is helpful for businesses who want to make any product development as they can ask existing customers personally about their opinion through social websites that allow communication possible between them. ASOS are also very good at using this sort of method and as they allow their customers to join them on Face book and Twitter where they can openly give their opinion and make conversations. This can then be used by ASOS when they are making product developments, because they can easily ask their customers what changes they think they should make in order to attract more people in buying their products.

Statement of Research

Research Objectives

- To explore an emerging area in internet practice that has implications for new product developers.

Research Problems

- What are the opportunities of internet in New Product Development?
- Benefits of internet marketing in relation to NPD.

Literature Review

1) Takanori OSAKI (2006) have researched about "Japanese Manufacturers and Consumer Participation in Product Development Using the Internet" .There are five important factors in consumer participation of product development using the Internet: "low cost", "speed", "open process", "high-density direct communication", and "consumer participation over a

wide range of product developments". Therefore, I define consumer participation in product development using the Internet as any activity in which companies have consumers participate, over a wide range of product developments, and communication is effected in a direct, open, low-cost, and rapid manner.

2) Soukhoroukova, Arina, Johann Wolfgang Goethe-University has researched about "New Product Development with Internet-Based Information Markets: Theory And Empirical Application". In this paper we evaluate information markets as a new methodology for new product development. Thereby, we show that information markets can provide beneficial applications at each stage of the NPD process. We further demonstrate that based on the desired application and restrictions on incentives and the set of participants, different design requirements arise. Therefore, a flexible software architecture is necessary, which can be applied at every stage of the NPD process. We develop such an architecture and ready-to-use software, which we use in our empirical study. The goal of the empirical study is to assess the reliability and validity of information markets for NPD by applying our software to product concept testing. Our experimental results indicate the capability of information markets to support NPD. We obtained reliable and robust results in an application for MP3 player product concepts. We find internal validity, evaluated in comparison to traders' self-explicated expectations, as acceptable. Further, the predictions of information markets are robust to the application of different price measures. This result is important compared to the forecasts of our benchmark study applying conjoint analysis. The prediction of market shares based on the results of the conjoint study requires the choice of an aggregation method, which strongly influences concept-specific predictions. The market-based aggregation of information markets, thus, reduces the need and uncertainty of experimenter decisions on the aggregation method and can provide reliable results, which possess internal validity. Due to the lack of real market data on these product concepts and the uncertainty related to the benchmark conjoint analysis, a final assessment of external validity is not possible. However, it is interesting to note that information markets provided predictions with the use of 8-12 traders compared to our extensive conjoint analysis using 307 respondents. Additionally, lower costs result from the relative ease of recruiting respondents to play simulated stock market games, as compared with traditional market research methods. Based on further positive evaluations of the validity of information markets, this method can be used for concept testing with a more efficient use of consumers or managers as subjects than survey- based methods such as conjoint-analysis.

Finally, we conclude that information markets are a promising tool for NPD, which offer a variety of possible applications within the NPD process. Although more research is needed on the validity of information markets compared to traditional market research methods for new product planning problems, our software-platform allows easy replications and modifications of such studies. Therefore, we expect that information markets will gain a greater interest in the area of NPD with an increasing number of applications.

Conclusion

In this paper we evaluate information markets as a new methodology for new product development. Thereby, we show that information markets can provide beneficial applications at each stage of the NPD process. We further demonstrate that based on the desired application and restrictions on incentives and the set of participants, different design requirements arise. Therefore, flexible software architecture is necessary, which can be applied at every stage of the NPD process. The goal of the empirical study is to assess the reliability and validity of information technology for NPD. Our research indicated the capability of information technology to support NPD.

Finally, we conclude that information technology are plays a promising role for NPD, which offer a variety of possible applications within the NPD process. Although more research is needed on the validity of internet for new product planning problems, our software-platform allows easy replications and modifications of such studies. Therefore, we expect that IT will gain a greater interest in the area of NPD with an increasing number of applications.

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