Introduction

New product introduction in today’s technology-driven markets carries significant risk. New product failure rates can be as low as one out of every three products (Antil, 1988) or as high as the 90 percent of new grocery products which are withdrawn within a year of their introduction. New technology, improved communications, increased profit demands and shorter product life cycles have added to the inherent risk (Rosenau, 1988). Yet, without the introduction of new products, deterioration of the firm’s market position is inevitable (if you stop growing, you start dying!). Without new products, firms will inevitably stagnate. Initial or early entry of new products, on the other hand, can result in new market development, long-term market dominance, and foreclosure of competitors’ responses (Crawford, 1988). Failure to respond to competitive new product introductions with appropriate speed can result in late market entry, a permanent loss of market share and dissipated profits (Kotler, 1988).

Timely and responsive new product development has become even more critical in the highly competitive global environment. The need to respond quickly to these dynamic global market forces requires the firm to integrate rapidly the perspectives and needs of both product developers and potential consumers (Barton and Krause, 1985). However, working against timeliness is the traditional new product development process, which is sequential, with each stage following in logical order (Sommers, 1982). An analogy of the traditional method is the relay race, which requires a smooth transition from runner to runner (i.e. one group of functional specialists passing the baton to the next group). Any lack of communication between various departments in the early stages of product development can be fatal to the success of the project as a whole.

The solution to the obstacles presented by the traditional linear model is concurrent marketing, which is becoming common in the new product development efforts for many corporations (Kochan, 1991). Today’s metaphor for new product development is the team sprint: teammates in a sprint can run at the same time, in the same race. Communication is unhindered and unbroken as teammates do not have to wait until the baton-pass to see and talk to each other. For global markets, in order to ensure success, this product development sprint needs to be combined with the knowledge of the international target markets. The purpose of this article is to explain the globalization of new products with the help of a global new product development model. The model suggests that the joint functioning of engineering, marketing, market research, R&D and management is essential, right from the idea generation stage of product development.

Globalization

Levitt (1983) pioneered the concept of globalization, asserting that in an era of global competition, the marketing strategy of successful companies is evolving from offering customized marketing mixes to each individual country market toward that of offering a single standard market mix on a...
A holistic method

With the aggressive competition from European and Japanese multinational firms that emphasize concomitant manufacturing, US firms have realized that product innovations alone cannot sustain their long-term competitive position without a product policy linking product and manufacturing process innovations (Wheelwright, 1985). Progressive companies worldwide are increasingly using a holistic method, the sprint method – as in rugby, the ball gets passed within the team as it moves as a unit up the field (Takeuchi and Nonaka, 1986). Today’s global competition represents a fiercely competitive environment in which importance is placed on increasing returns to scale and lowering production costs (Kotabe, 1990) and at the same time requiring speed and flexibility.

The traditional new product development process

The traditional new product development process consists of eight stages: idea generation, screening, concept development and testing, marketing strategy, business analysis, product development, market testing and commercialization. Ideas are generated and screened and the surviving ideas are developed into product concepts. A product concept is an elaborated version of the idea expressed in meaningful customer terms. During this stage, the product ideas that form the new product implementation list must be defined more precisely. The ideas must emerge into well-formulated sets of attributes designed to appeal to specific sets of customers. These attributes (at least tangible ones) must be transformed into detailed design blueprints. For this to occur, four major tasks must take place. First, product designs and/or models must be made available to manufacturing and to the team for preliminary market testing. Second, market acceptance studies on current product ideas must be finalized. Third, customer segments must be identified and target markets selected. Fourth, production studies must be initiated (Bingham and Quigley, 1989).

Market strategy

In the market strategy stage, the idea has completed its transformation into a physical product. Technical and design problems are resolved and consumer reaction is gauged in order to develop entry strategies. During this stage, emphasis shifts from technical to market concerns as the product approaches commercialization. The three major tasks to be accomplished during this stage are:

1. Refine the manufacturing process so as to be in a position to introduce the product.
2. Quality suppliers must be identified and material arrangements verified.
3. Refine diagrams and design prints in preparation for market testing, market simulations, or market entry (Bingham and Quigley, 1989).

Once management develops the product concept and the marketing strategy, it can evaluate the business attractiveness of the proposal (Kotler, 1988). Business analysis can be viewed as the dividing line between exploration and commitment. An idea is deemed appropriate to company mission and strategy after reviewing the sales, cost and profit projections.

If the product concept passes the business test, it moves to R&D and/or engineering to be developed into a physical product (Kotler, 1988). The new
product is now translated into a concrete tangible entity (Bingham and Quigley, 1989). This may entail the creation of computer based models (e.g. CAD systems) or the fabrication of physical models. After the management is satisfied with the product’s functional performance, the product is ready to be dressed up with a brand name, packaging and a preliminary marketing program, to test it in the market in more authentic consumer settings. Prototypes that survive the product development stage but do not yet meet the criteria to proceed to commercialization enter the test market stage (Bingham and Quigley, 1989).

A product idea has been transformed into a physical reality. The organization has marshaled its resources and committed to send the product out into the marketplace. Manufacturing has started; engineering is supporting manufacturing, and production control is ensuring that production schedules are keeping up with demand. Marketing is aggressively pursuing necessary advertising and promotional campaigns to stimulate future sales and is interacting with intermediaries to obtain cooperation (Bingham and Quigley, 1989).

Globalization of products
Responding to customers’ demands for more and better products, businesses worldwide are revitalizing the process of new product development, to ensure that the right product gets to the market quicker, at the right time, and at the right price. To be successful, global new product development cannot be a rigid step-by-step process, it has to be dynamic and simultaneous, as in the rugby or sprint example. To achieve this, companies are adopting an approach known as simultaneous engineering, parallel engineering, or concurrent engineering. Simultaneous engineering is the means of reducing product development time because it compresses the conventionally sequential product development process so that many of the development stages take place simultaneously. Central to the methodology is a multidisciplinary team in which all those different specialists who work on the same product development project operate simultaneously, at all times having access to the same information (Kochan, 1991). This is an essential requirement in the development of standardized global products.

The marketplace is increasingly becoming global and there are indeed many successful global products. Among consumer durables, the Mercedes car is a universal product. Among the non-durable goods, Coca-Cola is ubiquitous. Among industrial goods, Boeing jets are sold worldwide as a global product (Jain, 1987). As a result of this globalization, many companies have discovered that it takes more than the accepted basics of high quality, low cost, and differentiation to excel in today’s highly competitive multinational markets.

Global new product development process
With the traditional product development process, functions were specialized and segmented: the marketing people examined customer needs and perceptions in developing product concepts; the R&D engineers selected the appropriate design; the production engineers put it into shape; and other functional specialists carried the baton at different stages of the race (Takeuchi and Nonaka, 1986). The global new product development process requires a constant interaction between various departments so that problems can be identified in the early stages of the process; the traditional process will not work. Instead, the new product development team has members
from engineering, marketing, and management who work hand-in-hand in developing global new products (see Figure 1).

Idea generation and screening – revised
Good communication skills and empathy for customer needs are the skills a successful engineer can bring into the new product development. The engineer should thus get more involved in the idea generation process, especially with a global product, in order to avoid disparities between concept and design. Engineering must assess the technical feasibility and the production resources required to implement the ideas (Bingham and Quigley, 1989). Manufacturing requirements cannot be incorporated without identifying the different worldwide target markets. Marketing and marketing research can make useful contributions regarding the nature and size of the target markets, the relevant product-related cultural factors, the usage situations and lifestyles. For example, Japan makes right-hand drive cars for the European market and left-hand drive cars for the US market, even though technically the product is standardized. The success of McDonald’s in Moscow only proves that global products can be standardized but adaptation to different cultures is essential for success.

The input from the customers’ viewpoint can be augmented by an engineer with the skill to wear the shoes of the customer and anticipate customer needs. So, both identifying and assessing the nature of the target markets and inducting the manufacturing requirements into the product development process should be done almost simultaneously at this stage. Management performs the control function here, and ascertains that the product ideas and designs do not deviate from the company’s inherent objectives.

At this stage ideas are eliminated and narrowed down based on three interacting factors:
(1) feasibility in terms of product design (engineering),
(2) suitability of the product for the desired target markets (marketing), and
(3) adherence to company objectives (management).

Concept development and testing – revised
In the traditional development process, target markets are identified only after the generation and screening stages have demonstrated the product’s suitability. But in a highly competitive international market, target markets are already identified in the previous steps. Steps become overlapped, which
shortens the product development process. This stage involves marketing research, engineering, research and development, and management working together to develop preliminary models (Bingham and Quigley, 1989); or drafts of those initial ideas that have feasibility at face value.

At this point it is necessary to assess financial feasibility of the product: details of production capacity, raw materials required, markets expected to be served, and the channels of distribution. Most important, detailed blueprints of the product design should be submitted to the finance department in order for them to estimate the cost of production and estimate profits.

This procedure further narrows the number of possible new products (to possibly just one). Finance enters the global new product development process early. The advice and counsel of a financial expert can prevent the misdirected waste of valuable time and resources.

**Market strategy development and business analysis**

A company’s approach to global marketing depends, first, on its overall business strategy. In many multinationals, some functional areas have greater program standardization than others. Headquarters often controls manufacturing, finance and R&D, while the local managers make the marketing decisions. Marketing is usually one of the last functions to be centrally directed (Quelch and Hoff, 1986). Many multinationals are coordinating their marketing programs through headquarters in spite of testing the product in all representative markets. While working to achieve global coordination, some companies are also trying to tighten coordination in particular regions (Kodak, Proctor & Gamble) (Quelch and Hoff, 1986).

Products that enjoy high scale economies or efficiencies and are not highly culture-bound are easier to market than others (Quelch and Hoff, 1986). Manufacturers’ and R&D scale economies can result in a price spread between the global and the local product that is too great for even the most culture-bound customer to resist.

“Product innovation orientation” in the USA has led to undue emphasis on research-intensive product innovations. This concern for the development of competitive advantage may lead to the neglect of improvements in products and in the manufacturing process. Process innovations become more and more rewarding, in terms of returns, as the degree of product innovation increases. Additionally, firms that follow a policy of product standardization place greater emphasis on product and process innovations. The markets for high-tech products like computers are not only very competitive but also affected by technological change (Quelch and Hoff, 1986). Rapid technological changes bring about marked product or process design changes and today’s global competition represents such a competitive environment. A product’s technological superiority alone may be of short-lived economic significance unless it is backed by complementary process capacities. These enable the firm to capture returns from product innovations for a longer period of time. Thus, the interactive nature of product design and manufacturing process has become increasingly crucial to maintain market performance (Utterback, 1987). In the market strategy stage process innovations are vital, i.e. adequate attention should be paid to the manufacturing process leaving some room for minor adaptations to different international markets.
Product development and market pretest
Product development is achieved by adopting all the previous steps, because R&D and engineering actively participate right from the early stages of the product development process. If there are certain components that can be outsourced at lower costs, these possibilities might be considered at this stage.

Laboratory pretest models designed to forecast sales and market share for new products have been implemented in many organizations (Urban and Katz, 1983). Laboratory pretests are essential, especially in global marketing, to reduce chances of failure. If major problems are detected, it is not necessary to go through the expensive and tedious process of a market test. The product can be dropped at this stage without incurring heavy losses.

Market testing
If the product passes the product development and pretest successfully and still seems a profitable prospect, then it is put through the test market process. Testing the product in all representative markets is an expensive but essential step in global product development. The products that successfully pass the laboratory pretest should be subjected to international test markets. If the product is not feasible in certain nations, then the target market can be narrowed down by eliminating such markets. This type of market test in each representative market would help prevent extensive losses in the long run.

Product introduction
The final step in global product development is the decision as to whether or not to introduce the product in each of the markets considered. At this point, with the intense involvement of engineering in process development, it should be clear to the global marketer whether to introduce the product; and which markets should receive a concentrated effort.

Successful product innovations introduced into diverse markets require constant monitoring if a firm hopes to maximize the product’s contribution to the overall performance of the firm. Where the new introduction enjoys a great deal of acceptance and popularity, it becomes necessary to follow the introduction with improvements in production and distribution processes. Failure to achieve heights of efficiency offers an opportunity for competitors to gain in the battle for market share (Kotabe, 1990).

Conclusion
There is no question that we are witnessing global competition. This is especially true for industrial products such as steel and chemicals (Sheth, 1986). However, global competition has often been mistaken for global markets. In other words, success of foreign companies doing business in the domestic markets is probably due to factors other than an emerging universality of consumer needs and wants. Consumers inevitably demand more choices, and the result is market segmentation or fragmentation. This divergence of consumption values is not limited to the advanced countries but is also prevalent in socially controlled, traditional societies such as India and China (Sheth, 1986).

Global marketing has its pitfalls, but it can also yield impressive advantages. Standardizing products can reduce operating costs. Even more important, effective coordination can exploit a company’s best product and marketing ideas (Quelch and Hoff, 1986). In this article, we argue in favor of the standardization of global products and processes. Proponents of the
“standardization” approach to international marketing claim that it offers benefits in terms of increasing managerial control, reducing costs, simplifying strategic planning efforts, and taking advantage of home-country headquarters expertise. While proponents of the “localized” or “adaptive” approach to marketing strategies argue their position by differentiating voluntary (the marketing mix variables controlled by the international marketer) from compulsory (legislative and regulatory intervention by host country governments) modifications. According to Kotabe (1990), standardization is more effective than adaptation, because it gives the marketer an edge over other competitors in terms of time and money. Because a standardized marketing program is superior in quality to what localized approaches can accomplish, even with the benefit of local market knowledge, executives may welcome it (Quelch and Hoff, 1986).

The issue discussed in this article was the integration of the global marketing concept with the new product development process. The authors have attempted to provide a framework for the new product development process in view of the increasing globalization of markets. Basically, the product development process was derived from the traditional new product development process which consists of a specific stage-by-stage approach. For global markets concurrent engineering helps integrate a few of these stages, and shorten the new product development process. Also, there are varied views on the issue of standardization of products for global markets. It brings about some uniformity while catering to diverse markets.

References and further reading
Executive summary and implications for managers and executives

Global new product development: making it work

“Global new product development cannot be a step-by-step process” say Yelkur and Herbig in propounding a system predicated on running the various elements of new product development in parallel. Not just concurrent engineering, where prototype and manufacturing process development occur together, but “concurrent marketing” where the “soft” side of product development – target market analysis, strategy creation and evaluation – also overlap. And at the heart of this process lies that increasingly familiar animal – the multidisciplinary team.

Is this approach to new product development an academic pipe dream or can businesses really concertina the meticulous traditional approach to product development into a more dynamic approach? Or will we find that businesses begin to opt for the easily achievable in their search for product advantage? Yelkur and Herbig don’t answer these questions but do demonstrate the compelling logic of the simultaneous approach to product development. After all, there is no reason why target market definition and assessment should follow the initial prototyping process. Such an approach is often favored by engineers in high-tech businesses – we’ll invent the new products and chuck them to marketers who will sell them.

However, many businesses would challenge Yelkur and Herbig on their description of the “traditional” new product development process. Especially in industrial markets, new products are frequently driven by the requirements of customers’ processes rather than the daydreaming of design engineers. Customers report problems needing attention or gaps that need filling and, ideally, this feeds back to the design team. From here, it is a simple step to see how problems and issues in consumer markets can flow back but only if the business understands its markets.

Today, computer technology and other advances make the step-by-step approach faster – virtual prototyping, customer databases, expert systems and modeling techniques all mean that a previously long-winded and expensive process becomes easier and cheaper. Time to market is falling and the product life cycle reduces making managing a manufacturing business an endless search for new products and improved processes. It is no longer the case that a business can create a product, sell it for a few years while it develops the next one and then launch that as a replacement. Product extensions, additional features and better quality are all expected by consumers during the life of a product, and the business failing to provide these advances will struggle. Sadly, the strain of delivering these continuous improvements often means the entirely new is neglected.

Yelkur and Herbig go on to argue that the emerging global market means that even this more efficient traditional process will not deliver. Not only are there more competitors, but the speed of competitor reaction means that businesses must launch products on an all or nothing basis – gone are the days when a new product could be launched in one market and then rolled-out into other markets around the world. Ford, with its concept of a world car, knows that it cannot afford to spend the sums necessary to develop new products without that product providing sales worldwide. As Yelkur and Herbig observe, the companies that succeed do so on the basis of standardized products with tweaks rather than a multitude of variations supposedly to suit individual markets. Japanese motor manufacturers may make right-hand drive cars for their home market and the UK, but they also have to make left-hand drive for their other markets. Other changes are
needed as well, both to accommodate legal variations and the particular preferences of different markets. However, at the heart it is the same vehicle using the same parts. The same principle applies across other products.

The model proposed by Yelkur and Herbig acknowledges the demands of modern business by using the idea of a cross-functional team as the lever for a new product development process based on doing the various tasks of new product development simultaneously (at least so far as is possible). Clearly, such an approach must significantly reduce the time involved in new product development. What follow here are some practical suggestions for businesses looking to implement this concurrent product development approach:

• Set up systems to gather customer intelligence – complaints, usage patterns, structured feedback and orthodox market research can all inform the idea generation process.

• Prepare a brief for idea generation based on customer benefits rather than features. Remember that simply creating new features can add to consumer confusion rather than provide real benefits.

• Develop internal information systems allowing for the sharing of data. Without a decent management information system the concurrent approach will founder. All the information regarding a project should be available to all involved. Barriers built on technical or intellectual prejudices are dangerous since they lead to inappropriate products developed in a void.

• Give the new product team ownership of the project right through to production and make sure they are given recognition when the new product succeeds. Take a leaf out of Toyota’s book and encourage individuals or groups to work on their ideas on company time. Don’t limit idea generation to so-called product development specialists or senior management.

• Encourage employees to comment on your products – in many consumer businesses these workers are also customers and perhaps have a better grasp of customer issues than isolated senior management.

• Don’t overlook the service elements of the product or the distribution channel. Poor service or inadequate distribution are common causes of product failure. Involve customer service and logistics professionals in the team rather than expecting them to trot along later with a perfect solution to distribution and customer care problems. Such processes are as important as the manufacturing process itself.

• Avoid the (understandable) view that financial management is there to sign the cheques. Financial quality and efficiency could make or break a product, especially in the development and launch phases. Make sure finance buys your projections and prognostications – if they don’t they will pull the plug.

• Try not to be rigid in applying the process. It is not an improvement to replace a rigid step-by-step approach with a rigid concurrent marketing approach. Each project needs its own dynamic and its own priorities, and these are best set within the project team rather than imposed from outside.

If you do these things I’ll not promise universal success but you will stand a better chance of making Yelkur and Herbig’s ideas work, and by doing that you’ll hopefully prosper in a competitive world.

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