

Match the New Product Development Project with Its Context

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Abstract

This paper provides the frameworks and tools for matching the innovation and new product development project with its context in a European plastics converting company which develops, manufactures and markets total pipe systems. Where the company moves into new segment, it applies its conventional internally-oriented approach to its innovation and new product development and as a consequence, it faces problems in terms of delay of time to market and increasing costs. The development of composite manifold is taken as an illustrative case of the problem that the company is facing. As indicated by the case, the company is trapped in a "one-size-fits-all" approach in its innovation and new product development process. The paper is developed through the use of primary research in the form of in-depth interview and case-study discussions with innovation managers, program managers and marketing managers in the company's headquarters (Netherlands) and other European countries, and secondary research in the form of company data analysis and extensive literature review. Frameworks of newness and risk map as well as the corresponding scoring systems is elaborated and developed to increase the efficiency and effectiveness in the company's NPD.

Keywords: new product development, product innovation, newness map, risk map, efficiency and effectiveness

Abstrak

Tulisan ini didasarkan pada sebuah studi kasus di sebuah perusahaan rekayasa plastik dan sistem pemipaan terkemuka di Eropa. Peneliti bermaksud untuk menyediakan kerangka dan cara yang dapat digunakan untuk menempatkan sebuah proyek inovasi produk atau pengembangan produk baru sesuai

dengan konteksnya. Ketika perusahaan tersebut memasuki segmen yang baru, ia menggunakan pendekatan konvensional yang berorientasi internal sehingga ia mengalami masalah dalam inovasi dan pengembangan produk barunya, yaitu proyek yang berlarut-larut dan membuat peluncuran produk baru tertunda serta biaya membengkak. Pengembangan composite manifold dijadikan kasus untuk memberikan gambaran nyata mengenai masalah ini. Sebagaimana yang terungkap dalam kasus ini, perusahaan tersebut terperangkap dalam pendekatan "one-size-fits-all" atau satu-ukuran-untuk-semua. Tulisan ini dibuat melalui riset primer dalam bentuk wawancara mendalam dan diskusi kasus dengan manajer inovasi, manajer pemasaran dan manajer program di kantor pusat perusahaan tersebut di Belanda dan negara-negara Eropa lainnya, dan melalui riset sekunder dalam bentuk analisis data perusahaan dan kajian literatur. Kerangka peta kebaruan (newness map) dan peta resiko (risk map) beserta sistem skoringnya dibahas secara mendalam dan dikembangkan untuk meningkatkan efektivitas dan efisiensi inovasi dan pengembangan produk baru di perusahaan tersebut.

Kata kunci: pengembangan produk baru, inovasi produk, peta kebaruan, peta resiko, efisiensi dan efektivitas

1. Introduction

1.1. The Company and Its Strategies

The company under study is a plastics converting company which develops, manufactures and markets total pipe systems in Netherlands. The company's solutions include consultation, design, implementation and after-sales service. The customers are building and civil wholesalers, plumbing merchants, civil contractors, housing developers, large installers, utility companies and municipalities. The company is active in two distinct market segments: (1) Building & Installation (above-ground pipe system) and (2) Civil & Infrastructure (below-ground pipe systems). It coordinates its product development, cross border sales and marketing and key account management through these two strategic business units.

1.2. The company and its innovation

The company invests considerably in the development of its new products and processes. The company's competence includes: (1) Product development, including product design, prototyping, construction engineering, computer-aided design; (2) Process development, including extrusion, injection molding, welding, etc.; (3) Material knowledge on plastics as well as rubbers. Accredited laboratory services (ISO 17025), including mechanical testing, chemical testing, approval testing, and troubleshooting; (4) Patent and Trademark Services.

Innovation process in the company is conducted by deploying the Stage-Gate process as illustrated in Figure 1. There is a pre-feasibility phase (Front-End or FE process) in which the ideas from inside and outside the company are pooled and analyzed with certain criteria. The purpose of this phase is that the best ideas are selected. Front End process involves technical and commercial resources, e.g. strategic fit, market and financial attractiveness, technical feasibility and intellectual property, for assessing the ideas. Also, a program application is utilized as a tool to screen out the not-so-good ideas.

researcher goes to company's office once or twice a week depends on the interview or discussion scheduled with company's personals; and (2) secondary research, which is done in the form of company data analysis and extensive literature review as presented in theoretical framework of this study.

3. Theoretical Framework

Matching the Innovation to the Context

As addressed by Krubasik (1988), in practice, business managers tend to fall on a kind of generic "one-size-fits-all" approach to new product development. Krubasik (1988) emphasized that one size does not fit all because the best way to organize for successful innovation depends on the opportunity cost and the development risk of the project. Dolan (2009) explained the context factors as the framework to assess the innovation project in which the innovation process and market research must be tailored to the context by three key factors: (1) The impetus to the development activity; (2) The extent of market and company "newness" of the new product; and (3) The opportunity cost and development risk associated with the project.

Dolan (2009) explains that the first context descriptor is *impetus* to the development activity, i.e., the product's "reason why". The second key factor is the product's extent of "newness". In the figure 2, new-product category is placed within the newness map. Walker et al. (2006) explains the new-product category as follows:

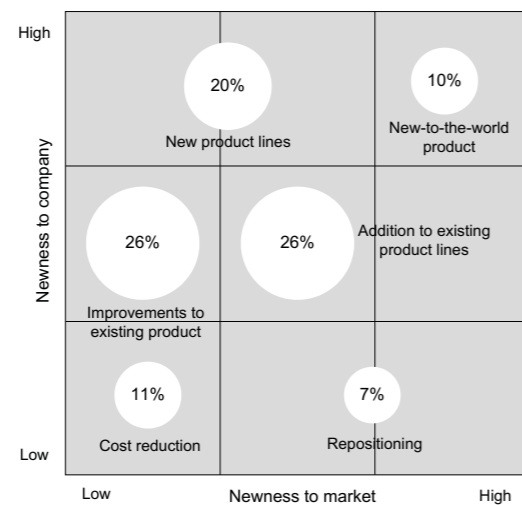


Figure 2. Categories of New Product Defined According to Their Degree of Newness
Source: Walker et al. (2006)

- New-to-the-world product – True innovations that are new to the firm and create an entirely new market (10%).
- New product lines – A product category that is new for the company introducing it, but not new to the customers in the target market because of the existence of one or more competitive brands (20%).
- Additions to existing product lines – New items that supplement a firm's established product line. This item maybe moderately new to both the firm and the customers in its established product-markets. They also may serve to expand the market segments appealed to by the line (26%).

- Improvement in existing products – Items providing improved performance or greater perceived value brought out to replace existing products. These items may present moderately new marketing and production challenges to the firm, but unless they represent a technologically new generation of products, customer are likely to perceive them as similar to the products they replace (26%).
- Repositioning – Existing products that are targeted at new applications and new market segments (7%).
- Cost reductions – Product modifications providing similar performance at lower cost (11%)

Dolan (1991) suggested the action that a company should take due to the "newness" which is described in the figure 3 below. .

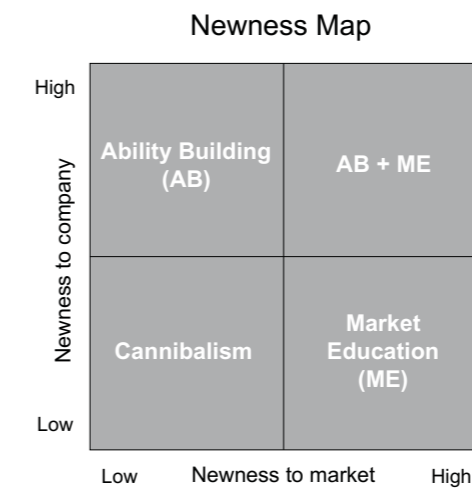


Figure 3. The Newness Map
Source: Dolan (1991)

As suggested in the categories of new product according to the newness above as well as implied by Dolan (2009), the constituents of the newness to the company are determined by questions as follows:

- Are current development resources fit with the new product? If yes, the newness is low, otherwise the newness is high.
- Are current manufacturing resources fit with the new product? If yes, the newness is low, otherwise the newness is high.
- Are current marketing resources fit with the new product? If yes, the newness is low, otherwise the newness is high.

The question of product/company fit means how well the firm can deal with the development, manufacturing and marketing requirement (Dolan 2009). For example, if the current marketing resources can easily and accurately capture the customer needs and translate them into new product definition, then the current marketing resources are fit with the new product and the newness is low. As Dolan (2009) states that only 17% of new-product has high newness to the market and a majority of products are relatively comparable the firm's existing products and "in-kind" competitor's, then the constituent of newness to the market is the existence of comparable product of the firm or competitors.

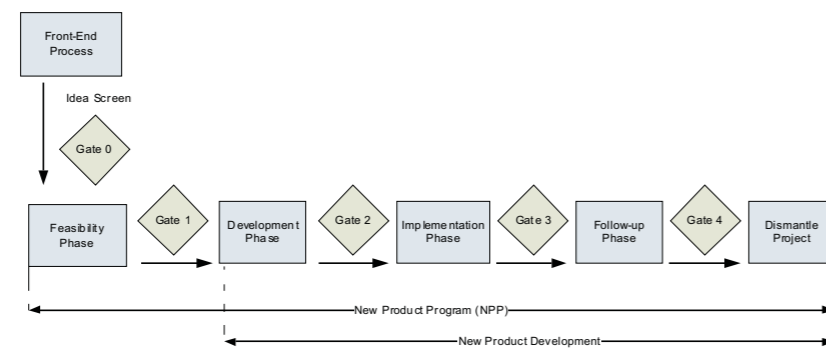


Figure 1. Stage-Gate of NPD process in the company
Source: the company's internal document (2008)

Ideas are analyzed, and screened out. Few selected ideas will go further to the feasibility phase. At the same time, it will provide better ideas to be assessed in the feasibility phase.

The case under study is composite manifold. The main function of the manifold used in under-floor-heating (UFH) and ceiling-cooling systems is to distribute the water coming from the boiler (or chiller) to the heating (or cooling) pipes in the system. The company has developed a manifold made of reinforced plastics as the integral part of the surface heating and cooling system. Some of the benefits of the product for customers are: (1) the material characteristic makes it light and easy to install; (2) the composite (fiber reinforced polyamide) does not corrode and thermal insulation is optimal; (3) equipped with memory function to ensure life time energy efficiency; (4) offers unique flexibility in use because it can be extended when needed and the direction can be changed easily.

Whereas, the benefit for the company are as follows: (1) One internal supplier instead of five or more suppliers for steel manifolds; (2) Product uniformity through out Europe; (3) Own production instead of purchasing lower cost price and higher margins; (4) Dual function: heating and cooling without extra insulation; (5) Lower stock of end products due to modularity of the manifold; (6) A basis for further uniformity in UFH products/components; (7) Differentiation vis-à-vis competitors; (8) The company brand appearance.

1.3. Why this project is interesting to be analyzed

Composite Manifold becomes a good example of how the company struggles with its up-front phase in the New Product Development process, i.e. to get the right marketing input for determining the list of requirement or definition of the new product. Changes in the List of Requirements repeatedly occurred in the development stage. Even worse, some changes also occurred even after the composite manifold was launched. Consequently, development cost and development time rose significantly and became the major cause of the delay of time to market.

Finding of this study also suggests that there is theoretical gap in the existing categorization of new products based on their degree of newness¹. The new product under this study can not fit to the existing

¹The new product categorization can be found at Walker, O.C., J.W. Mullins, H.W. Boyd, J.C. Larréché. *Marketing Strategy: A Decision-Focused Approach*. TataMcGraw-Hill, New Delhi, 5th edition, 2006

categorization and suggests that new category should be added to the existing new products categorization based on their degrees of newness. The new product under study falls between "improvement to existing product" and "new product lines" category which means that the new product has moderate-to-high degree of newness to the company and low degree of newness to the market.

2. Problem Definition

2.1. The Management Problem

The company believes in innovation to be one of the pillars of sustainable business success. One of the company's explicit key business objectives is to generate at least 15% of revenues with new products. The company's Strategic Business Units (SBUs) and its corporate R&D function play a leading role in achieving this target. Although the company consistently meets its innovation target on the corporate level over the last 3 years, they believe that they are underperforming in bringing the right marketing input to the projects. Lack of quality in marketing input is also one of the major causes of delays in time-to-market. The company would like to know how they can improve its product innovation performance on the aspect of understanding of market situation and customer needs in an early project phase to support proper new product definition and setting of commercial targets.

2.2. The Research Problem

The research objective is to come up with analyses why current practices of the company's NPD are underperformed and provide recommendations on how the company should undertake its up-front homework to increase effectiveness and efficiency in the innovation process. Effectiveness is the extent the company could meet its innovation target in terms of financial aspect and time-to-market. Whereas, efficiency of the process depends on how the company can keep the cost within the allocated budget.

This study will focus on the following research question:

How can the up-front stage in new product development increase the effectiveness and efficiency in the innovation process in the Company?

To answer the central question of this study, the following research questions have been defined:

1. Why solid up-front homework is needed in the NPD process?
2. What prevents the company from conducting the solid up-front homework?
3. What are the frameworks that can be used to convince the management about the necessary up-front homework?

2.3. Research Methodology

The methodology undertaken in this study project to answer the research question consists of: (1) primary research, which was conducted to get an understanding of the real problem in the company. Primary research consists of two things: (a) in-depth interviews and discussions with the relevant people in the company in the upper and middle management and (b) analyzing primary company data and documents. Research was conducted from September 7, 2009 until November 30, 2009 in which the

As indicated in the map, a new product in lower-left position with low newness to the company and low newness to market means competition between the new product and firm's own existing products or cannibalism. Dolan (2009) further explained that the high position in newness to market will ensure sales would be incremental but the cost is an issue of product/market fit. Therefore market education becomes the necessary measure to consider by the company. The high firm newness on the other hand raises the issue of the product/company fit, in other words the company has to build its ability. It is clear that if the project has high extent of newness both to the company and the market, then company needs to do the ability building as well as market education.

After the position in the newness map is considered, added insight comes from the Risk Map by considering the opportunity cost/development risk position. Krubasik (1988) defines opportunity cost as the risk of missing a fast moving market window. Developmental risk is the risk of introducing a wrong product to the market. The Risk Map is described in Figure 4 below.

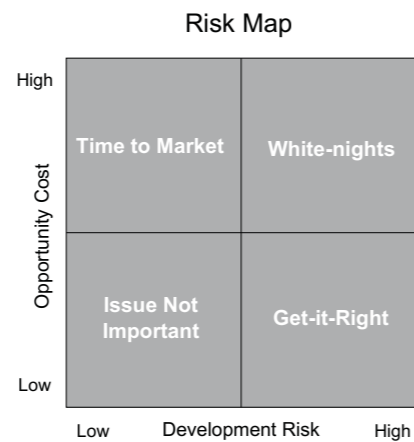


Figure 4. The Risk Map
Source: Dolan (1991)

Krubasik (1988) gives an example of the IBM personal computer (PC) development to give an idea about the high opportunity cost coupled with low development risk project. He describes that the demand grew by 60% a year and IBM might suffer an irrevocable loss of share from Apple and Tandy if IBM is too slow in developing its PC because companies like Apple and Tandy were controlling the market developments and beginning to cut into IBM's traditional market. Opportunity costs were high. On the other hand, the investment of \$10 million is quite low in proportion to IBM's equity value of some \$18 billion, making the development risk low.

Krubasik (1988) also noted that no mystery about market requirements (the appeal of competitor's products told the tale) and relevant technology were available and easy to master. From the illustration above, Krubasik (1988) gives an idea about the constituent of opportunity cost: (1) *Customer demand*, if the demand is high it means the opportunity cost is high; and (2) *Competitor's plan or action*, if the competitors go into the market with their new products, also the opportunity cost is high. Whereas, the constituents of development risk are: (1) *Clarity of market requirements*, the clearer the market requirements (in terms of the appeal of the products to the market) the lower the development risk will be;

(2) *Availability of technology* means that if the technical challenges are still big for the new product, then the development risk becomes high; and (3) *Amount of investment*, the bigger the investment into new product development relative to company's equity value, the higher development risk will be.

As described in the Figure 4, Dolan (2009,) further explains that in situation of low development risk and high opportunity cost, getting to the market quickly is an ultimate concern and a "crash program" is not an evitable choice (speed). On the other hand, low opportunity cost combined with high developmental risk places emphasis on making sure the product is right once it gets to the market (accuracy). The overall schematic framework about matching the project with the context is described in the figure 5. It describes how context impacts the proper new product development process (Dolan 2009).

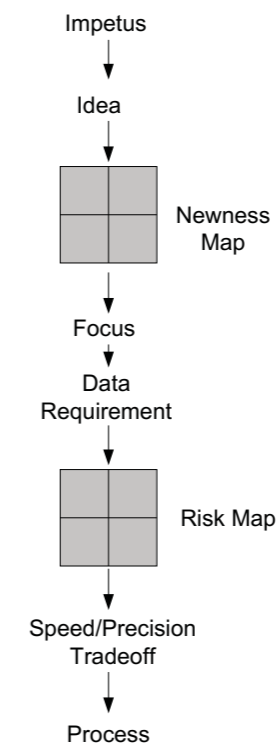


Figure 5. Overall Schematic How Context Impacts the Proper New Product Development Process
Source: Dolan (1991)

Dolan (2009) summarizes that impetus for NPD generates a particular purpose for the introduction, position of the idea in the newness map raise the key marketing questions and data requirements. The position in the risk map helps determine the trade-off of speed vs. accuracy in the product development process.

To make use of the Risk Map, Krubasik (1988) suggests selecting the appropriate strategic choice by finding the place on the map that corresponds to the degree of development risk and opportunity costs for a given new product as described in Figure 4. "Crash Program" and "Get-100%-Right" are the extreme cases where appropriate managerial responses are fairly straightforward. But there are in-betweens, like the case when the opportunity cost and the development risk are both significant.

Krubasik (1988) suggests that company can adopt the *step-by-step* approach in which company breaks the immensely complex development tasks into a series of smaller, more manageable steps. When the opportunity cost is less than development risk, there is merit to testing the new product in a market niche outside the producer's market. Krubasik (1988) calls this approach as *outside niche* approach. On the other hand, when development risk matters but less than opportunity cost, *hybrid* product could be introduced. When both opportunity cost and development risk are extremely high, it may no longer make sense to attempt development work entirely in-house, therefore Krubasik (1988) suggests taking *joint ventures* strategy. If joint venture cannot get to the market fast enough, then probably *acquisition* maybe necessary to provide a product immediately.

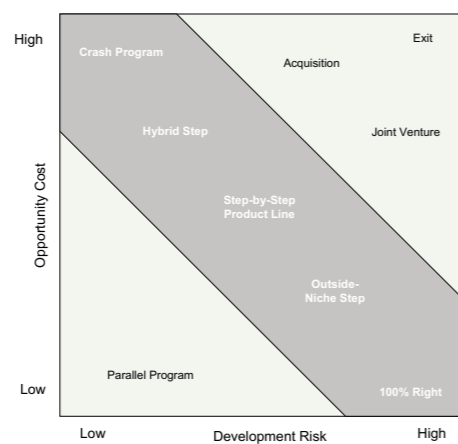


Figure 6. Product Development Map
Source: Krubasik (1988)

Exit strategy can be the only reasonable course when the cost and risk are so overwhelmingly high. Krubasik (1988) gives example of Philips that did this exit strategy when it sold its public switching business to AT&T. A nicer possibility is that both opportunity and development risk may prove so low hence the innovating company has the luxury to commanding the rules of the game (Krubasik 1988). Hewlett Packard, for example, is in the nice position of being able to start quantum leap parallel programs. HP reduced its technical risk by running a number of small development efforts and weeding out those that are less attractive (in terms of sales potential) or that are technically infeasible.

However, Krubasik (1988) also mentioned that the proper choice of development strategy is situation and company specific, not industry specific. He gives example of development work of nuclear magnetic resonance (NMR) for GE and Siemens. GE was taking 100% right approach because it saw itself in low opportunity cost and high risk situation. GE's product dominated the market at the time. By contrast, Siemens saw its opportunity cost much higher and taking step-by-step approach due to the fact that Siemens had only 20% market share in US scanner market.

4. Findings and Discussion

The company relies on its internal resources in conducting the innovation process including the up-front process. The company is very confident with its expertise in pipe system and solution and has been the market leader in Europe for years, in particular in Civil and Infrastructure.

However, with company's expansion, it is also moving into relatively new markets and new segments in which its experience and expertise is limited. Even so the innovation process for new product in this segment is conducted as usual. The new segment is treated the same as the other segment where the company has become the market leader since years and has huge experience. Composite manifold project is taken as an example. Like other innovation projects, composite manifold project is conducted as usual, and no external upfront market research was conducted.

Researcher would like to analyze this case by looking at the context where the innovation project is. The context could help to understand the position of the project in the newness map and risk map and what kind of necessary actions should be taken accordingly. First context is the impetus or 'reason why' the product is developed. The researcher's observation on the business case and from the interviews with directly involved stakeholders like the product managers, the project manager, the Business Unit Manager of the segment, and the director of the corporate R&D, the main impetus of composite manifold is to substitute metal manifold. The company should be able to get more profit from the lower cost for producing its own composite manifold than buying-in metal manifold from suppliers.

The researcher would like to assess the position of composite manifold in the newness to company by answering the constituents of newness to the company as follows:

1. Are current development and manufacturing resources fit with the new product? The answer is "not fully". Although the company has human resources available for development and manufacturing, the R&D team has to design a new special product with 'inside technology' in a relatively unfamiliar engineering plastic. The mold had as usual to be produced externally and it has a relatively high level of complexity.
2. Are current marketing resources fit with the new product? Most of the operating companies have experience in marketing the metal manifold, so in terms of bringing the manifold to the market, the current marketing resources do not have any issues. However, for the marketing function in terms of capturing the customer needs for composite manifold, existing marketing resources have very limited competence. It is reflected from inadequacy in quality of marketing inputs that caused the troubles that occurred during the composite manifold development. Therefore, the researcher would like to say that the answer is that the current marketing resources are "not fully" fit to the new product.

Therefore, the researcher would like to put composite manifold between the "improvement to existing product" and "new product line" category in the Diagram of Categories of New Products based on Their Degrees of Newness (Walker *et al.*, 2006). Why? Because "improvement to existing product" implies that the company has been making the product, but in this case the company is buying-in metal manifold instead of making it. On the other hand, "new product line" category suggests that the product is a completely new to the company, and it is not the case either. This category suggests that composite manifold has *moderate-to-high* position in the newness to the company.

The composite manifold developed by the company should be an improved copy of a plastic manifold made by its competitor which is marketed in Germany only. Composite manifold also has the same *basic function* as metal manifold. So, the company's composite manifold is actually not a new-to-the-world product.

However, the company's composite manifold has some product advantages as explained in the introduction part of the study. This fact suggests that composite manifold has *low* position in the newness to the market. Nevertheless, the different situation in the different markets should be taken into consideration and this could lead to the different positions in the newness to the market. Therefore, from theoretical perspective there should be an improvement or addition in the categories of new product defined according to their degree of newness as established by Walker *et al.* (2006).

From interview with the product manager in the company Italy, plastic manifold is *not* new for Italian market because the company's competitors sell plastic manifold before the company did. He and his team have experience in the Surface Heating and Cooling market segment and they have been selling metal manifold when the company introduces composite manifold into its product portfolio. Therefore, based on the *existing* composite manifold in the market, company's Italian subsidiary could give input to team of corporate R&D in the composite manifold development project.

Nevertheless, in terms of capturing customer requirement of composite manifold, company's Italian subsidiary suggested that customer requirement can only be identified *after* receiving feedback from the market following sales of the product over some period of time. This finding suggests that product manager in operating companies has no clue how to capture voice-of-the-customer in the upfront stage. Based on this fact, researcher would like to put the project on the newness map as described in the Figure 7. For company's Italian subsidiary, it is necessary to build its ability in terms of capturing the customer needs in a better and faster way. However, the necessity to do the market education is low.

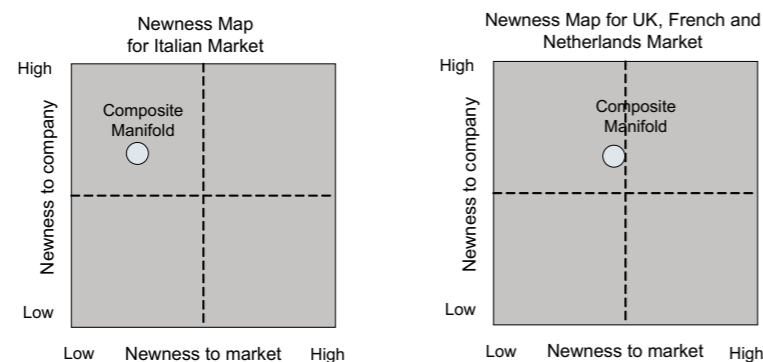


Figure 7. Newness Map for Italy, UK, French and Netherlands Market

On the other hand, other markets have different situation. In the UK, French and Dutch market, composite manifold is a relatively new product because only metal manifold is sold in the market. The company would be the first company to introduce composite manifold to the market. Product Manager in UK subsidiary explains that they prefer to use the term "composite" instead of "plastic" due to negative image of plastic in the customer's mind.

The position of the project in this newness map suggests that the UK, French and Dutch subsidiaries need to do ability building in their organization as well as market education to some extent. Relatively high position in the newness to the market requires them to prepare the necessary resources in terms of people, promotion programs and money to educate the market. At the same time, they need to build their internal ability in understanding the market and capturing the customer needs.

The other implication is that the company should consider assessing its marketing ability in terms of entering the market with the new product. From the interview researcher had with product manager in UK subsidiary, the necessity to have a different strategy of selling composite manifold as part of solution and as component is identified. Selling the composite manifold as a component requires close relationship with big merchants and wholesales which is different with selling manifold as part of project. In a project context, composite manifold is only one part of the overall solution that is being offered to the customers.

This consideration should come into picture in the beginning phase of the project, and project manager should be able to address these challenges and get commitment for resources. Product manager should be aware of the consequences and unwanted result that can happen if the commitment is not there. These are important issues to be anticipated to guarantee the success of the innovation project.

The third context is the position of the innovation project in the Risk Map. As suggested by Krubasik (1988), opportunity cost of the composite manifold project would be analyzed by looking at two constituents, i.e., customer demand/market growth and competitor's plan or action.

- The data from independent study of customer demand/market growth of composite manifold is not available, that is why the researcher looks at the sales forecast in the business case. For French and UK market, the sales forecast is based on assumption that market will change completely from metal manifold to plastic one. French subsidiary forecasted that the annual growth would be around 9 to 10 percent a year. Whereas UK subsidiary has much more optimistic figures with 25 percent growth per year from year-1 to year-4 and 10 percent growth at year-5. Italian and Dutch subsidiary made a very modest forecast. Italian subsidiary expected the market to accept composite manifold gradually for three years and after that market will be flat. Dutch subsidiary has small portion of the sales forecast because the market is small compared to the other markets. Dutch subsidiary forecasted that there is around 10 percent growth in the market. From the data in the business case, only UK subsidiary has a very optimistic prediction about the demand without a clear reason to justify the figures. Krubasik does not give any clear percentage criteria for the demand growth to be considered high, moderate or low. For this case, the researcher would suggest a low-to-moderate on demand growth.
- Competitor's plan or action: the company has no plastic competitor in UK, French and Dutch market. However, it has competitor in Italy that sell plastic manifold although has only little share (not more than 5 percent) in manifold market.

Considering both of constituents are low to moderate for the customer demand and relatively low to the competitor plan/action, the researcher would like to say that the opportunity cost for composite manifold is low, except for *Italian subsidiary* which is somewhat higher than the rest.

The development risk in the Risk Map consists of three constituents (as suggested by Krubasik): clarity of market requirement, availability of technology, and amount of investment.

- In terms of clarity of market requirement, the needs for manifold are there as the part of the Under-Floor Heating systems. Composite manifold provides advantages over the existing metal manifold due to the flexibility, better thermal insulation and its modular approach. Product's appeal to customers is not a mystery. Therefore, the risk is low from this point of view.

- From the technology perspective, manifold is not only about a plastic device. It contains valves and other components inside it that requires expertise and know-how to design and develop it. The company masters the plastic converting technology and the components are available in the market. In short, availability of technology is not an issue here.
- Amount of investment for composite manifold is not more than 500,000 Euro, which is relatively small for the size of the company under study.

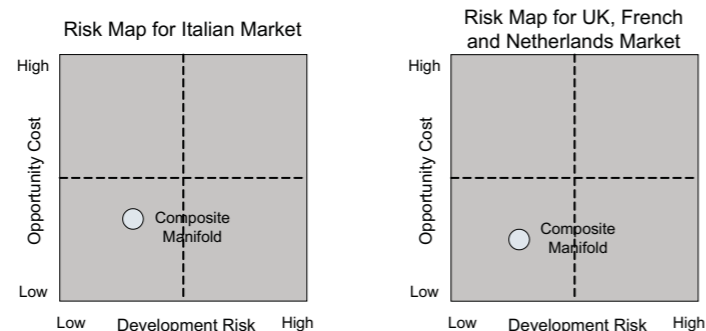


Figure 8. Risk Map for Italian, UK, French and Netherlands Market

Considering all the constituents of the development risk are low, the researcher would like to say that development risk for composite manifold is low. The position of composite manifold project in the Risk Map indicates that the company has a luxury to commanding the rules of the game (Krubasik 1988). As described in Figure 8 (Product Development Map) the company may choose a parallel program strategy to introduce composite manifold to the market by using project approach and by utilizing its wholesale distribution. Later on, the company can choose the better strategy and leave the unsuccessful one.

5. Conclusion

- Finding of this study suggests that there is theoretical gap in the existing categorization of new products based on their degree of newness. The new product under this study can not fit to the existing categorization and suggests that new category should be added to the existing new products categorization based on their degrees of newness². The new product under study falls between "improvement to existing product" and "new product lines" category which means that the new product has moderate-to-high degree of newness to the company and low degree of newness to the market.
- As most of the companies, the company is trapped in the "one-size-fits-all" mentality in their innovation and new product development process, also in the up-front phase. Although having good capability in technology and technical aspect, it lacks of proficiency in capturing customer needs and translating these into new product definition.
- To overcome the "one-size-fits-all" mentality, the researcher introduces the concept of matching the innovation process to its context. Newness map and risk map is used as a tool to analyze the innovation idea. In newness map the composite manifold project has moderate to high newness to the company and low newness to the market. Moderate to high newness to the company is determined by the degree of new product fitness to the existing resources of the company, in terms of development, manufacturing and marketing resources. Composite manifold does not fully fit the current development and manufacturing resources. As suggested by the position of the project in the

²The new product categorization can be found at Walker, O.C., J.W. Mullins, H.W. Boyd, J.C. Larréché. *Marketing Strategy: A Decision-Focused Approach*. TataMcGraw-Hill, New Delhi, 5th edition, 2006

- As suggested by the position of the project in the newness map, the company needs to do ability building e.g. strengthening its marketing capability in terms of understanding the market and capturing customer needs.
- The composite manifold project has low opportunity cost and low development risk as described in the Risk Map. Due to the low position in opportunity cost and development risk, the company has flexibility to "rule the game". The company can choose the parallel strategy as suggested by Krubasik (1998) to introduce composite manifold to the market by using project approach and by utilizing its wholesale distribution. Later on, the company may choose the better strategy and leave the unsuccessful one.
- As of many study cases, the framework developed in this paper might have limited use. Therefore, it is suggested to conduct further research and apply the framework and tools in different companies and in different industries.

References

- Bettencourt, L., and A.W. Ulwick. (2008). The Customer-Centered Innovation Map. *Harvard Business Review* (May): 109-114
- Bonabeau, E., N. Bodick, and R.W. Armstrong. (2008). A More Rational Approach to New-Product Development. *Harvard Business Review* (March): 96-102
- BusinessWeek podcast. (2009). *Innovation of the Week*, July 28.
- Christensen, C.M., and Raynor, M., E. (2003). The Innovator's Solution: Creating and Sustaining Successful Growth Place of publication unknown, Harvard Business School Publishing Corporation.
- Christensen C.M., et al. (2007). Finding the Right Job for Your Product. *MIT Sloan Management Review* Spring: 2-10
- Cooper, R. (1998). Benchmarking New Product Performance: Result of the Best Practices Study. *European Management Journal* 16 (1): 1-17.
- Cooper, R., Scott J. Edgett, and Elko J. Kleinschmidt. (2004). Benchmarking Best NPD Practices-III. *Research. Technology Management* Nov-Dec: 43-55
- Cooper, R.G. (2008). Perspective: The Stage-Gate® Idea-to-Launch Process—Update, What's New, and NexGen System™. *The Journal of Product Innovation Management* 25: 213-232
- Dolan, R.J. (2009). Matching the Process of Product Development to Its Context. *MBA Module at Kellogg Business School Reader*: 5-13
- Forsyth, C., (2009). Managing Mergers and Acquisitions: The company UK/Ireland. *Slide Presentation at Nyenrode Business Universiteit*, Sept: 2-34
- Krubasik, E.J. (1988): Customize Your Product Development. *Harvard Business Review*, Nov – Dec : 46-52
- Langerak, F., E. Jan Hultink, H.S.J. Robben. (2004). The Impact of Market Orientation, Product Advantage, and Launch Proficiency on New Product Performance and Organizational Performance, *the Journal of Product Innovation Management*, 21: 79-94
- Ulwick A.W., and L.A. Bettencourt. (2008). Giving Customers a Fair Hearing. *MIT Sloan Management Review* Spring 49 (3): 62-68
- Ulwick A.W. (2002). Turn Customer Input into Innovation" *Harvard Business Review* Jan: 91-95
- Walker, O.C., J.W. Mullins, H.W. Boyd, and J.C. Larréché. (2006). *Marketing Strategy: A Decision-Focused Approach*. TataMcGraw-Hill, New Delhi, 5th edition.