Tendencies in product development
in Danish food companies

Report of a qualitative analysis

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Project no 2

Preface

This is a report of a qualitative analysis of the product development function in seven medium-sized Danish food processing companies. Product development practice has most often been described in the light of traditionally innovative industries. But also in less innovative industries - like the food industry - the development and marketing of new products can be a route to improved competitiveness. Further, medium-sized companies, which are strongly represented in the Danish industry structure, is a unit of analysis often neglected in product development research where the emphasis has been on either small, often newly founded, or very large companies.

The aim of the study is to describe product development practice as it is undertaken by a number of medium-sized companies in the Danish food industry. Tendencies in the development functions of the companies involved are discussed, especially in the light of previous research results on successful product development. This study is related to a broader study of the key factors of success of new products and the possibility of applying previous research results in Danish food processing companies.

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Executive Summary

1. Earlier research has indicated that three factors are essential to successful product development: a) an explicit product development strategy, b) market orientation, ie close market contact during the whole development process, and c) the organisation of product development, mainly a certain degree of formalisation and an emphasis on up-front activities.

2. The product development function of seven medium-sized Danish food companies was analysed in a qualitative study, based on interviews with a management representative, a person responsible for marketing, and a person responsible for product development. The aim was to find out to which degree these companies live up to the normative advice following from earlier studies.

3. Most companies did not have an explicit product development strategy. Much of product development was initiated by direct customers and had a short-term orientation. Product development is focused on the physical product; other parameters are dealt with only at the very end of the process.

4. Knowledge about end users of the product is generally low and it is not usually attempted to channel information about end users into the product development process. There is heavy reliance on information from the direct customer. When product development is self-initiated, products may not be tested at all before launching.

5. The degree of formalisation of the product development process is very low. Usually, no evaluation of screening devices are used. The informal way does, however, seem to help cross-functional communication.

6. Generally, then, the companies investigated seem to score low on all three of the success factors identified in product development studies.

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1. The research project "Innovativeness as a key success factor"

The development and marketing of successful new products has long been identified as an important competitive strategy in many industries. Related to this general success factor, there exists quite an extensive body of empirical evidence identifying factors that increase or reduce the chances of new product success. While a large part of the success factors of new products are claimed to be under the direct influence of firms, only little has been published concerning the possibility of implementing these factors. The ultimate aim of the present project is to acquire a greater understanding of the possibility of improving product development by bringing the product development functions closer to normative advice.

The project consists of three phases, which are briefly explained in the following.

Phase one consists of an analysis of previous research results in order to establish whether there exists general agreement on the most important new product success factors. This has been carried out through an extensive review of the literature. Two methods were used for identifying and comparing the most frequent success factors. First, a narrative literature review of studies of success factors was carried out (Harmsen, 1992). Second, previous literature reviews on successful product development were compared, both as regards the methods used, the studies included, and the degree to which the conclusions agreed. While these studies vary somewhat, the general success factors they identify show a clear pattern.

Phase one concludes with a synthesis of the research results (Harmsen, 1992). Since this synthesis forms the frame of reference for the next two phases, an overview will be given in section 2 of this report.

The second phase of the project is a description of current practice, the aim of which is to compare the current practice of food processing companies with the research results. The aim of this phase is to identify possible gaps between the way companies actually carry out product development and the way they ought to carry it out according to the research results. This report is a description of phase two.

The third and last phase of the project aims at the actual improvement of product development functions in five companies through the implementation of research-based methods and techniques. The aim of this last phase is to try to operationalise the success factors into actions and tools which the companies can implement. The problem of the gap between the level of research results and the actual level of knowledge in the firms concerned has recently been demonstrated by Barclay (1992), who asked 149 product development managers in British and American firms about their knowledge and use of some of the largest surveys of new product development (eg Booz, Allen & Hamilton, The Stanford Innovation Project, SAPPHO, Project NewProd). Only 6.7% of the managers asked had studied any of the surveys in detail, and only 3.5% had attempted to apply the results in their own firm. This clearly shows the need for a greater focus on the diffusion aspects of knowledge and the implementation of research results. In this project, implementation will be carried out in the form of "learning by doing". The companies involved will choose an actual product develop-

ment project, which is then used as a model. Implementation will be carried out both in joint sessions where all the companies are represented and in the companies themselves, by means of new tools, structures, or actions.

Considering the interest "successful product development" has attracted, it is somewhat surprising that such little attention has been given to the possibility of applying the research results. The scientific gain from this phase consists mainly in the increased knowledge and understanding of implementation issues in relation to the application of empirical research results.

2. Success factors of new product development - a synthesis

The conclusion of phase one of this project is that there is widespread agreement on the most significant factors success of new products (Rothwell, 1977; Cooper & Kleinschmidt, 1986, 1990; Lilien & Yoon, 1989; Schewe, 1991; Edgett, Shipley & Forbes, 1992; Harmsen, 1992). In order to describe current practice, the general success factors have been grouped into three categories, which form the future frame of reference. The three general categories are:

-the degree of market orientation in the product development process,
-the strategic role of product development, and
-the organization of product development activities.

Figure 1: Categories of new product success factors
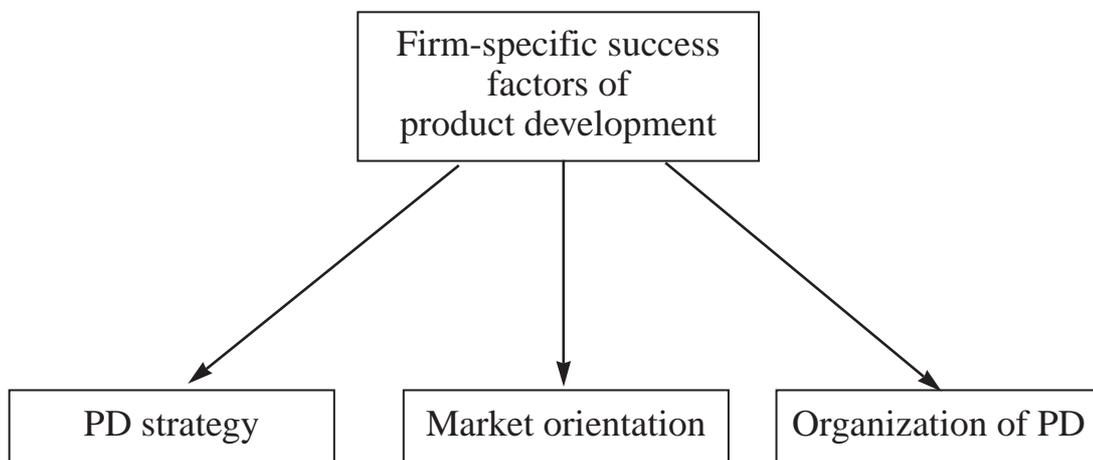
These factors are consistent across a large number of studies, cover a large number of the identified success factors - in particular, those with the highest priority - and are factors which are assumed to be under firms' influence (a prerequisite of the implementation phase). In my search of the literature, the only study I have come across which deals with the same subject area also synthesizes the success factors in a similar way (Barclay, 1992). The three factors will be explained in more detail in the following.

Product development strategy

A number of the identified success factors can be related to the program level, including top management involvement and longer-term planning. An example of this is the definition of a clear strategy, resulting in a focused approach to product development, and the recognition of the strategic importance of product development, which results in a more supportive climate for R&D projects. Studies have shown that projects are more successful where:

- an explicit product development strategy defines what type of products to develop;
- the product development strategy is part of the overall strategy of the firm;
- an understanding of the need for new product development is motivated by top management;
- top management actively supports the development teams.

(Johne & Snelson, 1990; Rothwell, 1977; Johne, 1985; Dwyer & Mellor, 1991).

Market orientation

The degree of market orientation is a factor which practically all studies identify as critical. Briefly, the emphasis on market orientation builds on the assumption that the success of a new product is determined by customers' perception of it. Understanding customers' needs and wants is therefore crucial to improving the chances of success.

Earlier studies were based on the assumption that market orientation meant that the idea generated from the market. This was shown to be fallacious when Mowery and Rosenberg (1979) argued that ideas do not exist in a vacuum (which implies that it is always possible to conclude after the event that successful products were based on demand). Furthermore, Cooper empirically documented that, even if 9 out of 10 successful products were based on ideas from the market, so were 7 out of 10 failures (1979).

Recent success factors which can be grouped under "market orientation" are:

- the degree of product superiority (from the customer's point of view),
- the degree of contact with the market/customers during development,
- the degree of up-front marketing, representation of the marketing function in the development process, knowledge about markets/competitors, marketing competence,
- the use of advanced market research techniques

(Cooper, 1979, 1985, 1990; Johne & Snelson, 1990; Rothwell, 1992; Barclay, 1992).

What is important to recognize is that the link to success is not based on a pre-defined concept of market orientation, but rather on the correlations between actions, activities, or product characteristics and success. It is in the interpretation of correlations that the concept of market orientation becomes critical. The definition of market orientation is therefore based on empirically identified factors. The degree of market orientation is deduced from factors

related to both the perceived product benefit and the market-related actions and activities in the firm.

Organisation of product development

There are two different kinds of factors in this category. First, specific organisational arrangements, eg cross-functional teamwork, or the existence of a project leader, have been shown to correlate with success. Secondly, a number of empirically identified determinants of successful new products, either related to the new product itself or to market factors, for example, can be dealt with through the implementation of such organisational tools as project screening systems (Harmsen, 1992). In other words, the success factors identified in this category cover both independent factors and activities, methods or organisational arrangements that support success factors found in the other categories.

Earlier studies largely agree about normative advice on the organization of new product development activities, especially on the identification of the most appropriate organizational structures and management support systems for different kinds of development activities. Results concerning "softer" factors such as management style, values, and group communication, are more vague, however. Within the organisation area, the following factors in particular are correlated with success (as results from several studies are mentioned, some may exclude or substitute others):

- cooperation between product development and marketing;
- the use of temporary multi-functional groups (as opposed to sequential processes, involving different functional departments at different times);
- clear goal-setting;
- a participative management style. The project manager defines clear goals and takes time to solve conflicts;
- loose structuring in the initial phases (idea generation, screening, concept development and testing). By means of incremental product development, a more formalised structure can be built up, also in the early phases;
- product development as a learning process;
- more formalisation in the implementation phases (eg formalised development processes, standardized control procedures);
- an emphasis on up-front activities (initial screening, initial market assessment, initial technical assessment);
- formalised product development processes (including a description of activities and control procedures);
- an emphasis on accomplishing all the phases and activities in the process.

(Roberts, 1977; Johne & Snelson, 1990; Cooper 1979, 1986, 1990; Kennard, 1991; Barczak & Wilemon, 1991).

3. Can the food industry be compared with other industries?

The synthesis of success factors is based on a number of empirical studies of the success factors of new products. The food industry is only represented to a very limited extent in these studies, however. Traditionally, research into product development has been carried out in particular - often innovative - industries like electronics, or at least restricted to industrial products (Rothwell, 1977; Schewe, 1991; Craig & Hart, 1992). Based on existing knowledge, it is not possible to conclude with certainty whether the food industry differs in such a way that makes it inappropriate to apply the success factors found in other studies. On the other hand, there is no evidence that the food processing industry differs significantly from other industries. Søgaard (1989) hypothesized that Danish food processing companies are confronted with barriers to product innovation in the form of stable demand patterns and markets, high risk of imitability, and co-operative ownership. The hypotheses on the influence of co-operative ownership were not verified, however (Søgaard, 1991), and companies that had undertaken product development (most often in the form of product modifications) had generally had positive experiences. A Swedish study describing and evaluating different product development strategies in food processing companies was carried out in 1982 (Nyström & Edvardsson), and concluded that cooperative companies had been technologically and commercially somewhat more successful than private companies. Even more interestingly, the results of this study were found to be similar to the conclusions drawn from studies of other much more research and technology intensive industries (Nyström & Edvardsson, 1982).

A number of the general success factor studies have included food companies as well as other industries. Some studies (eg Cooper, 1984) have compared the different industries without drawing particular attention to the food industry.

The frame of reference for this project is the knowledge base of previous empirical studies of the success factors of new products. An alternative would be to carry out a new success factor study for the food industry. Since the indicators discussed above point in the direction of the generality of success factors, however, the first approach seems the most appropriate.

4. Design of current study

This section describes the methodology of the current study and the limitations of the results. The design of the questionnaire is discussed in more detail in appendix A, while the questionnaire itself is shown in appendix B.

Unit of analysis

The food industry consists of many different kinds of companies, ranging from producers of primary products, through service companies, to fast-moving consumer-goods companies. Since industrial firms constitute the primary source of the knowledge base (ie previous studies of success factors) used in this project, food processing companies have been chosen as the unit of analysis. Furthermore, medium-sized companies were chosen as they were assumed to be most in need of improvement.

Defining a "new product"

Following Grunert and Baadsgaard (1988), a product case is defined as new when the customer finds it new. This does not necessarily involve a technical change or improvement, but can in principle stem from any change in the product. Incremental product innovations are also included in the definition, therefore. The focus of the project, both as regards theory and the situation in the food industry, is primarily on what others have labelled old product development, improvements, or incremental innovations (Johne & Snelson, 1990; Frøslev Christensen et al., 1990).

Methodology and limitations of the results

To describe current practice, it was decided to carry out a qualitative study, covering the product development function in seven food processing companies. The aim of the study was to obtain a detailed and thorough description of current practice which could then be compared with the normative advice from previous research. The advantage of a qualitative approach is that, through a thorough discussion of the issues, it offers a better understanding of the problem. We gave access to detailed information a higher priority than access to representative information. This was also essential for the next phase of the research project, ie the implementation phase, because this could then build on an understanding of the practice of the firm in question.

Twelve companies were contacted and introduced to the project. We were mainly interested in medium-sized, non-competitive (since the implementation phase will include some cooperation between firms) food processing companies who were active in product development. We ended up with seven cases, and carried out 21 interviews in all, three interviews per firm: one with a management representative, one with a person responsible for product development, and one with a person responsible for marketing. In a few cases we interviewed fewer, however, because the same person carried out more than one function. In other firms, we interviewed four persons, because two persons represented the same function. All respondents were interviewed singly (except where a function was represeted by more than one person, in which case they were interviewed together). In the following cases, no answer should be interpreted as a reaction to the previous comment of another respondent. The interviews followed a semi-structured questionnaire which was mailed to the respondents before the interview. The questionnaire (see appendix A) consists of 41 questions, covering the role of product development in the company, the degree of market orientation, and a description of the organisation of the product development process - as explained earlier. All the questions have been phrased to reflect the general findings of the empirical studies. Respondents were not asked to answer the questions in advance, just to take a look at them. The interviews lasted between 1 and 3 hours, and were conducted by two persons. Interview reports were written by each and then cross-checked; all interviews were also taped. The accounts of current practice were based both on the interviews and secondary information. All the companies involved have seen the accounts and had the opportunity to correct mistakes.

The seven cases are presented in the following. As qualitative material I have chosen to include a number of quotations from the interviews to describe the different aspects of product

development in the companies involved. To protect the anonymity of the companies, the descriptions contain a minimum of information on company background and product development. The accounts are discussed in the last section of the report. The main emphasis here will be on discrepancies between the normative advice of earlier research and current practice in the firms concerned. While the tendencies discussed here apply to the great majority of companies, it is important to keep in mind that the discussion is based on qualitative material from a limited number of companies, and that they can therefore not be assumed to be representative. The small number of respondents aside, it can be assumed that the companies which have agreed to participate in the pre-project phase and which have also displayed an initial interest in further cooperation also have a special interest in product development. On the other hand, it should also be noted that we did not have to contact more than twelve companies to get seven acceptances - which can perhaps be interpreted as a fairly good indication of interest in the area of product development.

In the following quotations "MA" refers to management, "SA" to sales, and "PD" to product development.

Case 1

Case 1 is a medium-sized food processing company, with annual sales of approx. DKK 100m, and 50 employees. The company sells processed food products in both the national and international (bulk) industrial markets, where they are used as ingredients in further processing. These products are high quality - high price products.

The role of product development

Product development, especially improvements in existing products and processes, is considered of strategic importance, and this is where the firm's main efforts have been. In an effort to move away from relatively standardised bulk products, the company has tried to become more flexible and sell a greater proportion of customer adapted products.

SA[1]: "As all our products are based on the same primary product, we cannot talk about life-cycles like we do for other products. Therefore we cannot say that we have to introduce a brand new product every second year - some of our products are practically the same as fifty years ago - but we continuously adjust and modify the products. So it is necessary for us that a development takes place." As regards new products: "We are also working on a product where we can see that one of our competitors is making a lot of money." Service, or ideas for new applications, can also play an important part. PD: "Much of what we label product development, at least on other markets, is that we try to come up with some new applications for use, ie, they buy a standard product, but we tell them how to use it, or we recommend another ingredient in the final product....but it is difficult for us to say if this really means something for the customers."

In Case 1, product development is primarily based on direct suggestions or orders from customers, and the company is more interested in being a good partner than introducing innovative products. SA: "I don't think we would be considered the most innovative firm in the industry. On the other hand I think our image seen from our customers is that we are open and flexible and know a lot about the product, so I think they will come to us if they have special wants. It happens more that way around than us going to them with a lot of new products. It primarily goes that way, that they specify their needs more than we try to do it."

SA: "Currently we are aiming at a closer relationship with our customers, also on the technical side, so we perhaps can work together on defining their needs and thereby also become a little more innovative than we used to. One of our intentions is to bring our product developer with us to the customer."

Case 1 has not defined any long-term product development strategy, and the role of new product development has not been explictly defined either. PD:"Well, it is not written on a piece

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[1]In this company the export manager and product development manager were interviewed. Both are members of the management group, so their answers also represent management views.

of paper. Currently I'm working with this quality assurance system ...and as a part of that, what the company objective is, but in my opinion this is a piece of crap. You can take our objective or the objective of any other company and it would be almost the same; it is not interesting, but we have to write something. On a lower level I think we have some kind of implicit agreement because we work so closely together, but it is not written down."

PD: "The focus in the last few years has been on an optimization of the processes and products and this has really meant an economic advantage. In the last few years we have not introduced so many new products, but today we can produce the same products - only at much lower costs and at the same quality. I think from now on we will focus more on developing new products."

The company does not directly estimate the costs of product development. Asked about the amount of resources used for product development, PD replied: "I really don't know. We have never actually separated this. It's very integrated, which means that we have, for example, never had a budget for product development, but the amount is very very small compared to the sales turnover."

Market orientation of product development

Ideas for new products stem almost solely from the direct requirements of the firm's customers. Apart from direct customer contact, the company also participates in a few trade fairs. Information on market trends is collected through general trend analyses. SA: "I think we know our customers very well. We have had long-lasting relations with many of the customers. But apart from the direct contact we don't spend resources on, for example, external market research. But our sales approach is a little special. Most of the time customers contact us. In fact we sit and wait for them to call us. There are other situations - eg when we try to enter new markets - then we have to be more active. We do a little bit of industrial advertising in international trade journals and we are also represented at the largest food fairs, but this is more to show the flag than to attract new customers." And later: "Apart from the improvement of existing products we also develop new products aimed at new markets. These products are most often developed on the basis of some customer contact and some specific wishes from the customer. If I can sell the idea internally then there are no problems, then we are very flexible."

PD: "We have two types of customers. We have customers who call us and order one specific product..that's it, we never get any further, we have no idea whatsoever, and then we have the other group of customers who say..our situation is so and so, I have some ideas, can you suggest anything. He describes his product and also what he had in mind, and we develop this very close contact until we finally find the right solution. In fact in situations like that we're part of the recipe design for the customer."

Organisation of product development

As a function, product development is placed under/with quality assurance, and has access to the direct resources of approx. half the time of the product development/quality assurance manager.

In partnership with almost all other companies in Scandinavia producing the same kind of products, the company has set up a jointly-owned company for long-term product development. At this level there is a formalized and structured approach to the work, with clear goals, formal project teams, project planning, etc.

Asked about how internal product development is planned, SA explains: "Well, rather than asking how it is planned you should ask whether it is planned at all, and the answer is no. We do have some long-term planning in relation to the strategic alliance with the other companies, but internally we don't have any plans." PD elaborates: "Some of it [product development] we plan, some we just do. As we are so relatively few we just discuss it and make a note about it at our weekly meetings - and then it's planned."

While daily production clearly has first priority, both laboratory, production, and sales staff are involved in development work. About the fact that product development is primarily carried out using excess resources, PD comments: "Of course, I think it can be very irritating to have to wait two weeks until there is enough production capacity to set up an experiment. But on the other hand I understand the importance of the daily production - but even though I understand, I can still be impatient."

Case 1 earlier tried to formalise the product development activities, but the system became too rigid. Today, the company coordinates on a informal basis, without the use of a product development manual or system for collecting and documenting experience. Documentation is primarily a personal matter. PD: "In relation to a single project, a short action plan is developed with some time limits, budgets, etc. We always start with some kind of objective - eg what is our target, and what should the product perform. There might then come a lot of modification, but we always have some target to aim at. We don't use any specific form for this. Earlier, when NN was here, we implemented a system like that, but we didn't feel it worked out as it should. Not that we could not follow the idea - perhaps we were not good enough at following up on the system. I'm convinced that the system was theoretically correct, but it didn't fit with our structure." On the previous, more formalized approach to the development process, SA adds: "This system came from another firm and everything was very well worked out, but we realised that we had to spend more time filling out the different forms than we really spent on the work. So it fell apart." As regards documentation, "I do make some meeting reports and file them, but I don't use them a lot. It is more a matter of my own experience. I don't know if they make some kind of documentation in product development." According to PD, there is some general documentation: "We do make a report about each development project. We have a book where we can see back to 1987 what we have done and which ideas we have screened. We have realised that there really is value in this system, especially when someone new enters the firm."

Product development decisions are made by general management (which consists of the CEO, production manager, sales manager, and product development/quality assurance manager). According to SA, the close communication between them minimizes the need for more formalisation: "All four of us also take active part in the development process - but this is because we are a small company and all have more than one role", and "our work is more cooperation between four persons than between different functions. Actually things are pretty informal and quick, our offices are next to each other and the doors are always open." PD agrees, but points to a typical problem between product development and marketing: "I feel we have a really good cooperation. We are really on the same level. But there is one thing which sales/marketing has difficulty in understanding, and that is that time limits are as long as they are...."

SA elaborates on the process: "Without having appointed formal project leaders, we each push different projects. It's natural ...the one, who got the idea will inevitably be the one to push it through." On the other hand, a comment from PD shows that the low degree of formalization and the small number of key persons also makes coordination difficult: "At most of these meetings [where product development decisions are made] the sales manager is not there. Our discipline concerning meetings has been very bad, because we are so often elsewhere."

To a question about organisation, SA replied: "Every three months we have a product development meeting. We have to admit that currently this meeting takes place shortly before we have to go and see our sister-company - and the meeting is a kind of "what was it we should have done meeting", to put it bluntly. But the small projects don't go through meetings like that. After all we are all four placed near each other which means that we can start a new project on the same day without having to do a lot of paperwork."

Concluding remarks

The importance of product development as a means of differentiating products has increased. A close relationship with customers and responsiveness to their needs is the key to these customer-adapted products, and the company is becoming increasingly customer oriented. Ideas for new products come almost exclusively from customers, and projects are initiated after direct customer requests. The low degree of planning means that development is influenced by somewhat random customer contacts, but longer-term development is handled jointly through the strategic alliance with other firms. Product development is informal, integrated in the daily work, and with the involvement of all functions at management level. This makes for flexibility. There are no written product development strategies or plans, and little documentation, but an emphasis on personal experience and informal, flexible coordination.

Case 2

This company is a medium-sized food processing company with an annual turnover of approx. DKK 160m. Until recently it was family-owned, but has since been sold to a holding company owned by international investors. The company produces and sells processed products to consumer markets through large domestic retailers. Most of the turnover is domestic, but the firm places growing importance on export. The firm enjoys a strong position in the market, and is market leader in both market share and price.

The role of product development

One of the main goals of the company is to continue the development of product variants within existing product lines as well as develop new product lines. The goal of increasing the level of exports also puts pressure on product development, which has to adapt products to both different legal requirements and different consumer preferences.

PD[2]: "I think we could exist on the domestic market without developing new products. But to ensure our competitiveness, and of course also in relation to exports, product development is quite important." On the role of product development, SA comments: "I think the strength of the company today is a broad product assortment and a continuous adaptation of products. I also see a tendency for new products to account for a larger percentage of sales." PD: "We have tried in the last few years to develop new products for other segments, eg new product lines on the domestic market, and we're also developing products for new geographical markets." PD continues: "It is very demanding to have to continually be at the disposal of the export department. They have such short deadlines."

SA: "Our growth should come from exports, and here we have a clear strategy. We have to be able to adapt to the demands of the market, decide what position we want in this market, and develop products for this position."

Discussing the amount of resources used on product development, it was found to be approx. 1% of sales. SA:"I am surprised at this figure. I think we will devote more resources to this area in the future, especially as we want to increase our export share. A lot of product development resources will be devoted to overcoming special legal requirements as well as adapting the products to other consumer preferences. In some of the markets we want to enter we will also face tough competition."

Approximately 2/3 of the defined projects are actually launched, and the success rate is about 50%. PD: "I think that approx. 50% - no, more like 75% - of defined projects are launched. The rest - well there are no clear criteria - they kind of drop out or are put on the shelf. About half of what we launch is successful."

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[2]Only the sales manager and product development manager were interviewed in this company. Since both are part of the management group, their answers should also reflect management views.

Degree of market orientation

There is no systematic generation of ideas - the initiative for new products comes from four different geographical production units, the board of directors, and sales. MA: "The choice of new products is influenced by our knowledge of both primary products and existing production processes. I don't know if market considerations come before or after this." SA: "A lot of the activities in product development are product variants or specific changes for export. But we also have new products, where the idea - so to speak - was caught as it flew past by someone inside the company who believed in it. Then we kind of blindly developed the concept."

Case 2 sees the retailer as the customer and focuses on developing products which retailers can make a margin on, which has resulted in a very good relationship with retailers. A closer relationship with retailers in export markets is expected, especially as regards private label arrangements. SA: "Usually we listen very much to the retailer's opinion concerning our new products. We have a good relationship with the retailers because they can make money on our products. This is our real advantage." PD: "I also think that in the future there will be a much closer dialogue with the large retail chains concerning development and delivery. We do see this structure in some places, and it is on its way to Denmark, and this will mean that brands like ours will get competition from private labels. I think this will place the responsibility for new product development with purchasing."

While it is clear that end-users play a secondary role in the development of new products, they are sometimes represented in the process in test panels, which are used to evaluate new tastes and rate our products vis-à-vis those of our competitors. The test panel is sometimes internal, sometimes external, eg consisting of local schoolchildren. PD: "The results from the test panels have to show a clear difference in taste between competitors' products and ours. But only the taste and texture of the product is tested. We don't include other parameters." SA was asked about the possibility of, for example, testing different packaging: "No we wouldn't do that." Case 2 arranges recipe competitions to get feedback from the market as well as new inspiration. PD: "We do some tests on taste, and sometimes some kind of competition where we get some response about the product as well. We did one recently on one of our products - we processed the data ourselves, but I think that I'm one of the few who actually saw these results."

Developments in the market are followed by means of general market analyses (GfK and Nielsen). Sales contributes little to this kind of information, or inspiration for new products. PD: "Well, of course I have some knowledge as a consumer myself, and having worked nearly all my professional life with food...., but from sales - there is no creative feedback at all. There is some information about market conditions, of course, and whether our own products sell, but this information we can get anywhere. There is no feedback of a creative or inspiring nature. They sell, stack the shelves, and make some good campaigns, but...", and later, "No I don't really think that persons knowledgeable about consumer needs and wants have a lot of influence on the product development process." PD: "Our sales manager interviews the direct customers, but product development is not directly involved. We did talk about that. It would be good that I get an understanding for, or at least don't lose my understanding of, market

needs, and I think it would be the right thing to do." SA: "We have very limited knowledge about consumer behaviour, but to be a bit provocative, our sales department is more interested in buyer, or retailer behaviour than consumer behaviour."

The sales department is involved in the late stages of the development process, where they have to approve of the product before it is put on the market. SA: "The role of the sales manager is like a control function. He has to approve of the product once it's developed and to evaluate whether we can sell it or not."

Organisation of product development

The product development department consists of two persons who spend half their time on product development. In addition, the company has a product development committee represented by management, sales, production, and product development/quality assurance. This committee meets every three months to discuss all new projects, and follows this up with a report. Some product development projects are carried out so fast that they never go through a product development committee meeting.

PD: "The management level, including the board of directors, make decisions about specific products. On the other hand they don't necessarily have much insight in the process. For example, they don't understand if I tell them that something will take six months. They nearly faint. Other activities they don't interfere with at all. I think in a company our size we ought to have a clearer structure. But again this is a question of resources." PD again: "Product development has the responsibility. But as I told you there are no assistants. We have to take the time - and I like that - to do the actual experiments in the kitchen."

Most projects have a short development time (1 to 2 months). The process can be described as sequential, with the final product being handed over to sales, who, in cooperation with an advertising agency, define the final product concept before launching it on the market.

SA: "Our product development consists basically of good ideas which are tried out and implemented - as long as we can agree that it is a good idea. We have big problems, both in defining concepts before the actual development and specific goals." SA elaborates further on the process: "When we get an idea, we try to develop the product. Then we hand it over to sales. Perhaps they don't think the product is very good, but they go out and give it a try. Then they come back and tell us that they couldn't sell it. Then we have to improve the product and afterwards we will try to sell it again - perhaps with success this time." SA: "We market product brands, but we don't have any product department or product manager. It's run by the sales manager, and the rest is handled by the advertising agency. After the product is developed the advertising agency designs the concept and marketing plans. There is no ping-pong in the development process."

SA: "Our evaluation of products is very subjective. I don't think product development is as well-coordinated as it ought to be, we are probably too democratic. For example, we have no

objective criteria for evaluation. We have formed a product development group at management level, but there are so many short-term product development activities that ruin our plans. Perhaps we have this kind of process because we don't really agree on what we actually want. This democratic approach means that everybody can have their own opinion, but it makes things difficult for product development."

Discussing the actual number of current development projects leads the interview around to the organization of product development: PD: "I have to check the number in the last report from the PD meeting. I know this clearly shows the weakness of the system. There are so many projects that I can't keep track of them. We can admit right away that it is not possible to undertake all the development projects that are thought up. I would like a more structured approach - in fact I have worked one out, but it is still in the drawer - it is not possible for this organisation to work that way. We have so few resources. But if we could follow this approach then things would run more smoothly, we would have the necessary number of meetings, have some deadlines, etc. But it's very difficult for a one-man function - I have no department to draw on. And once you get involved in a number of different projects then it becomes impossible to keep the structure you wanted yourself."

On the documentation side of product development, SA explains: "We don't do it today, it's only something we say we ought to do", and PD adds: "I'm so busy all the time that there is little time for documentation like that." SA: "I think this company is characterized by taking bigger risks than our competitors when we talk about product development, especially the launching of new products. You could also say that we are less systematic, because there is no doubt that some of our competitors do much more market research and also spend more time, which means that their new products are more documented."

In general, cooperation between sales/exports and product development is considered to be good, but the pressure of work in product development can be quite heavy at times. PD: "Generally, I wouldn't say that the cooperation is super. Some things are seen very much from the sales side, while I'm very product oriented. In product development we are technologists. In some projects we work together from the early phases. And I wouldn't say that there are conflicts. I think it works out pretty well." SA: "I would say that we have good cooperation. It's perhaps not structured or very efficient, but we generally have an agreement and respect for one another." A further remark from SA illustrates the informal nature of cross-functional cooperation: "Of course, we have different phases in the development process. But as I told you, we are rather product oriented, and it's only the product, the technical side of it ..... whereas the concept and the connection between production and marketing ..... there are definitely some holes. Not any real gaps, because things are passed on to somebody. But there is very little coordination."

Concluding remarks

Case 2, which is a market leader in its product category, makes heavy demands on the limited resources of product development. The development of product variants, new product lines, as

well as the adaptation of products for export markets are all expected to be carried out by this function. Projects tend to be initiated more on the basis of personal experience and intuition than formal planning, and are not subject to formal screening criteria. The firm has neither a product development strategy nor a product development system. The retailer, rather than the end-user, is identified as the key customer, and the firm is not interested in detailed information about end-users' attitudes, wants, or user situations. Market and customer orientation is more an afterthought than a policy, and it is not built into the product development process, which focuses almost exclusively on the core product. The documentation of experience is very limited. The picture is of a company with a strong product orientation and good relationships with direct customers, but a low degree of market orientation as regards end-users and a product development function that is weak and overloaded due to a paucity of planning and documentation.

Case 3

Case 3 is a medium-sized food company which produces and sells processed food. The company has customers in both the retail, catering and industrial markets, and its products are both own-brand and private-label products. 75% of sales come from exports. Annual turnover is approximately DKK 360m, and the company has 400 employees.

The role of product development

The company has been heavily involved in product development since the 1960s, and its role has gradually changed from that of a supplier of private-label semi-processed products to a) marketing own brands, b) increasing sales of processed food products, and c) strengthening its relationship to fewer but more important customers.

SA: "I wouldn't say this has been an explicit plan - it's been more of an incremental development. Some years back private label was the rule in our product category, but this tendency is not so strong any more. You can also see it from their point of view. Without private label arrangements they have more freedom, and, for example, don't have to sign a contract to buy 100,000 units from us which they might be able to get cheaper from somebody else. Right now we're developing some new products where we get into broader competition with other food products. We try to develop products that will be displayed in other parts of the store, eg supplementing frozen food with fresh products, so our products will be represented in more places."

Commenting on the existence of a product development strategy PD adds: "I don't think we have anything written down or anything like that", and MA agrees: "This is very distant to us. But deep down I think we know where we want to go." PD: "No we don't have any plans or something written like that. For a couple of years we have just been going on - and I think we are doing all right. I think there is a development towards more processed products, but to sit down and formulate it clearly - I don't think we can do that."

On the importance of product development: MA: "We exist on our basic products, but in the long term, product development is essential. But not just new products; it has to be the right new products...I think already that product development has an important role in the company, and it will continue like that in the future. It's essential that we make some products that others don't. Copying can be a good idea, but it's certainly not enough." PD: "The development of new products is important for us, especially in the future, but they account for a small proportion of sales. The real volume comes from our basic products." SA: "One of the reasons that product development is increasingly important for us is that the retail market is so concentrated today, and as suppliers we have to be an interesting partner for our customers. We simply have to sell our products to all the retail chains. Therefore we must be able to interest them, and one way of doing this is, for example, by introducing new products. And of course then there are also some trends in the market that we have to follow. But still, our basic products are sold at a very stable level, while the more processed products have a much shorter life cycle."

It is difficult to get reliable information about the number of projects launched, the rate of success, and the amount of resources used. The company is not much help here, since there is no specific development budget. MA: "I would say ten percent of ideas become a project, but if it's more or less...." And PD: "Approx. 80% of projects that reach trial production are launched", and as far as the rate of success is concerned: "Well the success rate, it's very difficult to say. I think if you compare us with other companies, our success rate looks okay. I think that our largest competitor has been somewhat more innovative than we have. But this means that sometimes we can benefit from their heavy marketing expenditure. The more they spend the bigger is the benefit for us, because it has been possible for us to sell similar products at a slightly lower price. But back to the success rate. It's not easy. On the other hand, if we can see that a new product doesn't make any money we stop it." SA is more specific: "It's not even certain that it is our decision. It is very possible that the retailer will tell us that if we cannot increase their rate of turnover - by, for example, increasing our marketing effort - they will not buy the product from us any more. Space management can be rather revealing."

Asked about development resources relative to turnover, PD's reply was a short "I don't know." MA was more forthcoming: "We don't have any figures on that. We don't have any specific budgets either. We look at one project at a time, and here we also evaluate if we need some kind of financial support."

Product and process development are closely interlinked. Of the two, more financial resources are spent on process development, whereas product development takes up more time.

Degree of market orientation

MA: Whether we are market oriented is a good question. I would say that often we make what our direct customer tells us he wants, but whether the end-user is waiting for this product - there we have to trust our direct customers. The retailers - well if it doesn't work out, they just say we should lower the price. So we can have a bit of conflict there."

PD elaborates on the role of retailers:" I think we have a good understanding of the wants and needs of the customer. I'm not talking about the end-user. But I think we have a good understanding of what the retail chains want - we have very direct contact with these customers. And they know what the end-user wants. They have done their market research. We spend almost nothing on this activity." The retail chains and catering market deliver product specifications, and sometimes even sales estimates, of possible new products. PD: "Sometimes we get a specific recipe, saying exactly what the product should be like, or they even give us a specific product and say 'this is what we want you to copy'."

Test marketing of new products may be carried out in cooperation with selected retailers. The development function can also have direct contact with retailers, but more often product development and retailers communicate through sales.

Trends from other markets are an important source of new ideas, as are the large food fairs. PD: "What we really do is that we attend and also participate in the large food fairs. There we see what is going on in other more trendsetting markets. We don't exactly copy these products, but we can modify them to a Danish or European standard. But we also get some good ideas internally."

There is no systematic collection of information about end-users, and specific information about end-users is not integrated into the development processes. Agents in export markets contribute only little information about consumer or customer wants. Most of the knowledge about these markets is collected by the export manager. An advertising agency is used for designing packaging.

MA: "I have a clear-cut answer to your question on the amount of money spent on market research. We spend nothing. But I have been thinking about it. Sometimes we have these discussions concerning how we should market a specific product. But you could also turn the problem upside down and say that we ought to find out what the customer really wanted initially. But it's often like ..well, if you have the product then it's tempting just to go ahead and get the packaging finished and launch it, sometimes just because that seems the most easy thing to do."

SA: "We have never conducted market research. Earlier we talked about knowledge about the end-user. I think this is an area where we have very very little.. and we would benefit from getting more feedback. But it's a hurdle. We cannot handle it. It's simply too much for us. We have had products where we didn't believe in the decision of the customer, but we didn't have the market information to show that they might be wrong - and we didn't have the marketing resources to push the product either. In the catering market it is easier to get some information. For example, we can invite some of the customers and have a discussion on their wants. This is something we're planning to do."

Organisation of product development

In 1984 only one person was responsible for product development. Today, the product development department consists of two persons.

PD's initial remark about this was: "Well, we don't organize things very much at all." And from MA: "We tried to do things a bit more formalized, but it kind of ebbed away. We tried to develop some kind of plan, where we could document what projects we were working on and how far we were at a certain time, but... Now we have something I would call a short checklist, and based on this list we can discuss the project at our weekly meetings. We once tried to split the project into different stages, but we didn't follow up on that."

It is primarily the sales department which, via customers, initiates new projects or generates new ideas. There is no systematic idea generation. The subject of initiating new projects came up in a discussion on the target market for new products. MA: "I would say that our new

products are aimed at existing customers. But often it's the other way around. It's the customer who tells us what they want. New ideas come from the sales department and also from customers. Of course we also come up with some new ideas ourselves - after we have visited a trade fair, for example. The ideas come from many different places, and then we take a critical look at them. But a lot of the ideas come directly from customers' specific product specifications. Or they even ask us to copy an existing product, or ask us if we can make this cheaper." The early phases of the development process are often handled by the customer. It is therefore difficult for case 3 to evaluate the early part of the development process. PD: "It can also be put this way. When the customer comes to us, we don't know how much time he has spent developing the idea and specification."

SA: "Process development can also initiate product development. For example, we could have a supplier of machinery contacting us about a new production process which could enable us to develop new kinds of products not currently produced in our market. That also happens."

The development process is, to a large extent, characterized by the relationship with the customer. PD: "Usually we get a possible sales price for a specific product and also estimates of the volume. Then we can very early calculate whether we can make this product and make money on it too. This means that we can sometimes stop at a very early stage. Later on when we have the product, we present it to the customer and perhaps modify it according to their suggestions. It also happens that we make an agreement about a specific volume of a new product which they guarantee to buy. On a few projects we have had some deadlines, but usually it's just to finish the projects as soon as possible. It's not like we say 'this step should be finished in two weeks and the next step in three'." SA: "In the development process, communication could also be between product development and the customer. Sales doesn't have to be involved at all."

Talking about responsibility for development projects, SA explains: "Well of course the formal responsibility is with top management and then product development, but it's also a matter of initiating the project. If, for example, it is a product for one of my customers I will follow up on the project." MA: "Formally, the production manager is responsible for the project as soon as there is a prototype, but usually it is the person who had the idea who follows up on it and makes sure that the project is brought up at every meeting."

The management of new product development is handled informally at weekly management meetings. These are not specific product development meetings, but general management meetings where all kinds of problems are discussed. This implies that all functional groups are represented in product development decisions. The management group initiates projects which it thinks are sound. There are no budgets, and no specific plans are made for the projects. The only measure of success is in the form of sales figures.

SA: "At our weekly management meetings we check up on the different projects. Where are they now, what should be done next, and so on. And I think we are capable of reacting very quickly because we are so small." SA adds: "I would say product development is formalized to a certain extent. We have some kind of list, which we fill out about the specific project.

And every department can also check up on the part of the work they have to do. But the real coordination is done at the weekly management meetings."

SA has the following to say about cooperation between sales/marketing and product development: "We are in contact several times a day. There are no problems." This is corroborated by both product development and top management.

Another side of the informal coordination inside the company appears with a question on the number of present projects. PD: "I would say eight." SA: "I ought to know. Some are moving a bit faster than others, but I would say four or five." MA: "I guess we have about ten or fifteen."

There is also a great deal of informal documentation. The product development manager makes a record of his experiences, and the weekly management meetings are put down in a report. SA: "We don't do a lot of documentation. But on the other hand our CEO knows what is going on, and he can stop things....." MA: "I must say, we don't have one hundred percent follow up on new products in relation to some specific aim. But perhaps we discuss what went wrong and whether we can change anything."

The bottlenecks in product development are not due to a lack of resources. PD: "The bottleneck in product development can be the investment in new production processes. I don't think we have any other problems with resources. Another bottleneck related to the duration of the development process is the design and print of the packaging." SA: "The projects that we initiate - well, I would say that we also have the necessary resources to finish them."

Concluding remarks

Despite the lack of explicit or documented product development planning, the company has changed its focus and increased the emphasis on new variants and new products. The product development strategy is not documented anywhere, but rather considered joint informal knowledge. Again we see that, in product development, the link between the company and the direct customer is central, while the degree of market orientation - defined as product development based on an understanding of the needs and wants of the end-user - is low. The organisation of product development is based on the informal coordination of the key persons involved. This has the advantage of flexibility, but suffers from a lack of clear overview and documentation.

Case 4

Case 4 is the food processing division of a large Danish food company. Annual turnover for the division is close to DKK 1200m. The company as a whole has been going through changes in organisational structure, with fusions of a number of smaller units. Recently, the emphasis has been primarily on production and process optimization. The products are mainly sold on the domestic market, and here most of the turnover comes from retail and catering, where approx. 75% is private label. In export markets most of the turnover comes from industrial customers.

The role of product development

Apart from one rather innovative product line, which has been developed and marketed as a brand, the general level of innovativeness is low, the majority of new products being adaptations of basic products to specific customer requirements. The duration of development projects varies a lot. Some adaptation projects are finished in two weeks, while some run for more than a year. The average length of a project is about six weeks, however.

While there is continuous concern over cost optimization, the company also attaches a lot of importance to product development. SA: "With the position we want to obtain, product development will be central. With the exception of one project, most of what we do can be labelled product adaptation. The primary challenge has so far been on production and cost optimization, where we haven't been very efficient until now. We have to be much more offensive, both in relation to longer-term development, but especially in relation to being able to evaluate product potentials and respond to suggestions from customers much more quickly. We have some awful examples, where everything except the timing was perfect. Related to that it would be nice with much closer cooperation between product development and the customers - I would like product development to be directly involved with the customers. Our role in relation to customers should be that of a problem solver - and we can fulfil that only with close cooperation. You could also say that we should be the perfect sub-contractor." MA agrees - up to a point: "Product development plays a part, I don't think we could do without it. I couldn't say, on the other hand, that it is our primary concern", and continues, "Perhaps product development will be emphasized a little more in the future. But my opinion is also that, in the food industry, we will always find a very small percentage of turnover to spend on product development. After all, you can't make the products so differently, or perhaps a success criterion would be to produce the products as old-fashioned products - in any way that points the same way towards limited product development. Perhaps we should be twice as good, but not ten times better."

The company has an explicit product development strategy: SA: "Well, it's very nicely described, but this clearly requires a strong product development function, and I would say there is a contrast between aim and reality." PD: "With the strategy we have now, I think we have the resources we need. Of course we sometimes have to do the trial production at 4 in the morning, but we have flexibility, and I don't see any problems concerning that. When we need

help from, for example, production, there is always someone who is willing to come in a couple of hours early. It's important for us in product development to participate in the trial productions and not just hand over a piece of paper to production, so they won't just say 'here they come again'."

Since a majority of projects are initiated and developed in cooperation with the direct customer, almost all initiated projects are launched. SA: "I would say that approx. 90% are launched. If the customer initiates a project with us, it is because he has a market for the product. Perhaps this market is currently served by a different product, but if we handle things sensibly, the market will be ours. So there is almost a guarantee in advance." PD elaborates: "I would say that all projects are launched. Usually we say that we will not develop any product until we know that it can be launched. We don't spend time on somebody coming up with some fancy idea and then have to find out if there was a market afterwards. Our focus is very business oriented. Can we make money on it? We don't have so much time for longer-term product development, but I think this has something to do with our prime concern, which is not product development per se, but market expansion. But of course in the long term it can be really dangerous not to say 'now we have to do some long term development'."

Regarding the measuring of the success of new products, PD explains: "I wouldn't say we measure it precisely, but of course we try to estimate whether we get anything out of it. The success criteria would be 'do we sell some of this new product', but it's not like we say 'this was really super'. We know when something is good."

On the types of new products SA comments: "Growth comes from the introduction of relatively known products to new customers and markets, and I would say that considerations concerning developing totally new products come second to that," and "from my point of view we contribute with very few innovative products. What we generally do is to follow any competitive product that might have proved itself, or we take an existing product and market it in export markets." MA: "We have developed one rather innovative product line. We feel that this product line helps to position us in the eyes of our direct customers, even if economically it doesn't mean so much."

While the strategy for product development is rather clear, it is difficult to get an estimate of the resources used. MA: "We have a problem concerning accounting for product development. The budget for the development function doesn't equal what we spend on product development."

Market orientation in product development

The development of new products is often initiated by, or in close cooperation with, customers. PD: "Our product development is very market-oriented and very much directed by cooperation with direct customers. I could give you a specific example. We have a retailer who asks us whether we can make a certain product. Then we develop it as they want. The retail chains are so influential today, we cannot go in and put any pressure on them. On the other

hand it's fair play. The objective is that we can both make money on the product. We almost have open calculations. This also gives us an advantage after the launch. We have this specific product that was developed in close cooperation with a retail chain. We have had no complaints about this product. We very much focus on not saying 'here we are, buy this product or don't'. We want to have this dialogue with the direct customer."

The company does not gather detailed information on the end-user, and the knowledge that does exist comes primarily from direct customers. SA: "I would say that we have a good understanding of our direct customers, we communicate a lot with them. For good reasons we don't know much about the end-user. On a general level we know the tendencies or trends in different markets. I don't think that knowledge of the end-user is very important. After all we are also offensive in the marketplace in relation to existing products, which we take to new customers and tell them: 'We have this product, and see these trends in your market. Don't you think this would be interesting for you?'. When we spot a hole in the market it can be based on our feelings/intuition, but we also have different kinds of reports written by, for example, business school students. But we can only do that with longer-term projects." PD: "Knowledge on the end-user? We don't have more than we get from our direct customers. On the other hand we work with all the major retail chains in our markets, and it's also in their interest to make good products. So there is a great deal of trust in this relationship. Well, we also get a little information whenever we have had demonstrations in the shops. Then they report back to us. We have also sold some of our trial productions internally, sometimes with some questions included, but we don't consider this information of very high value, as our employees can be considered a bit biased. We sometimes run test sales, and there we get a lot of response from the customers. We also get a lot of general market research - much more than we have time to read." MA: "We don't go around doing a lot of market research. We don't even have a marketing department. We have had one person in a period, but that didn't work out very well. Perhaps we will consider having a marketing person again. On the other hand, the retail market for our product is not larger than we know what's going on, also at our competitors, and therefore you don't need so many scientific reports. We can all look it up in reports and read that there are trends on this or that area - it's not so revolutionary."

The market input for new products comes to a large degree from a dialogue with customers. SA: "With the customers we have, we tend to focus on the physical product. Things like packaging, advertising campaigns etc., are not so important. We don't have the resources to develop the end-user's brand awareness or loyalty. Where we have to develop loyalty is with the direct customers," and "test sales may be carried out, but generally we develop prototypes and present them to the customer until we agree, and then the customer gives us a trial order."

Organization of product development

The company seems to follow a well-organized and well-structured procedure for product development, which is, among other things, reflected in a clearly defined role for product development: product committees meet 3-4 times a year to develop product development strategy; estimations of product potentials are made before the project is actually established; ad

hoc meetings are held between product development, production, and sales concerning the co-ordination of projects; the company uses a development manual; projects are continuously evaluated; and there is computer-based documentation of projects.

SA: "The decision to start a new project is formally placed in the product committee. But this doesn't work at all. So what we actually do is that I pick up the phone or we send a memo directly to product development and tell them that we want this or that. We then give product development the existing information on the customer's wants, so they have some background material. In the beginning we filled out all the different forms that were part of the system we had agreed on, but it ebbed out. So now we just do it the old-fashioned way. The initiation of a project is rather informal, and it is often based on the feelings of the sales person. There is not any written product concept or anything like that. It's perhaps inside the head of the sales person." MA: "I think the product committee functions, but it doesn't have to be that way that everything must pass this committee. There is also the day-to-day communication, and if there is no time to wait until the next product development meeting, well, then the decision is made. But these are primarily decisions concerning sales adaptations."

All trial production is full-scale. PD: "Our main problem in product development is our capacity, when we are really pressed for time. And sometimes the fact that we run our experiments full-scale can be a problem due to the lack of spare capacity."

According to sales, documentation is also largely informal. SA: "While we have some documentation concerning the recipes, we only have little documentation on the development process. If we later want to use some experience from an earlier project, we contact the person who undertook the project. The experience is tied to a single person", and adds, "I think we see the same mistakes over and over again. Perhaps we do document what we do, but this knowledge is not used as it should be."

To a large degree, communication is close and informal. MA: "Too much bureaucracy .. it doesn't fit in here. But to be honest I feel that we could benefit from systematizing the process a little bit. It should be possible to find a balance between bureaucracy and.... But the decision-makers in this division are very few, so our communication doesn't have to be bureaucratic. This of course implies the risk that things get tied to single persons, but this is the price we have to pay." PD: "We have an agreement: If the product development department feels too much pressure, then production, sales, and product development arrange an informal meeting where we prioritize projects, so we can work ourselves out of it again." PD comments on informal communication regarding projects: "Sales have some wishes. They ask us if we can do this or that, and if we feel it sounds sensible then we try to develop a budget and start developing it. But if they come with something we think we've seen before, or know others have had problems with, then we discuss the project with them. It's not like sales tells us to do something and we just say okay."

Concluding remarks

This company is by far the largest of the seven. Product development is not considered crucial, even though there are different opinions on its role. The company seemed to have the most well-structured and formalized product development strategy and system, but in reality things were handled just as informally as in the smaller companies. Documentation also seemed to be very limited in this company. Projects are mostly initiated on requests from direct customers, or at least developed in cooperation with them. The majority of projects are adaptations, and therefore low-risk and low-innovativeness projects. Even though the company has introduced at least one innovative product line based on consumer trends, market orientation is generally low. This is not so much due to negligence as the little importance attached to this factor.

Case 5

This case deals with a small division of a medium-sized food company. The division produces and sells processed foods primarily to the Danish retail sector, but also to the catering market. Case 5 has tried exports, but has not found a market for its relatively high-priced/high-quality products. The objective is not growth per se, but a niche position in relation to larger competitors. The division has an annual turnover of approximately DKK 45m, and employs 35 people.

The products are sold both as private label and under the name of the company.

The role of product development

The main objective of the division is to optimize the product mix. Product development thus plays an important role, the intention being to develop new products that can substitute products with lower margins. "Product development is clearly important. Both in relation to our objectives, and also because our products sooner or later are imitated and we have to develop something new. In relation to our size we feel that it is an advantage to produce rather specialized products. New products also stand for an increasing part of sales. We have a very close relationship with our customer, but if you ask our customers to rate us, I don't think they would mention us as being very innovative. But we stand for good-quality products. Recently we have tried to get stronger in catering. The reason for this lies in the tough competition in the retail market. As we have limited production capacity we don't want to compete in the discount market, but rather make products with a higher margin"[3].

There is not much formal planning as regards product development, which is guided by the overall strategy of the company. "We have a ten-year plan which is revised every year. This primarily focuses on the objective of future sales. We also have four annual meetings where we develop the policies for the nearer future. But we don't make detailed plans for specific projects or have a documented product development strategy."

"It's difficult for us to estimate how much we spend annually on product development. It's accounted for as part of sales and production costs, and then there is our time, but the costs would not be more that 0.3% of annual turnover. But it's very difficult to say, because we don't really account for it." Of the many ideas that are generated, approx. 5% get through the first informal screening, and approx. 50% are implemented. Of these about a third are considered commercial successes.

Asked about the kind of development projects the division carries out, PD comments: "Some of the products we develop are adaptations of well-known products. In the food business it

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[3]We interviewed two persons in Case 5, one of whom is central, since he is at the same time is responsible for the division, sales manager, and heavily involved in product development. The other respondent is an assistant in product development. As most comments come from the former, references are only made when the quotation comes from the product development assistant.

will always be like that. But we have also made products that can be seen as new on the market."

Market orientation

To a large extent, ideas for new products come from trends identified at trade fairs and other markets. Case 5 is not represented at these trade fairs. "We're not (represented) at these food fairs any more. Our most important customers number perhaps ten or fifteen persons. They should have the new products before we present them at a food fair anyway, and at the fairs we only got in contact with some very small clients, which we weren't very interested in in the first place. What is more important is to meet your own key customers and see their reaction to new trends or products. That can give us a hint. We don't exactly copy products, but often we get the ideas from somewhere. I have had the pleasure of visiting America in connection with some trade fairs, and there you can get a lot of inspiration. Not to do something identical, but inspiration.... I wouldn't say they are ten years in front of us, but they are definitely ahead of us."

Case 5 is very careful not to involve direct customers, ie retailers, in the development process, as they feel that it's better to present products that are ready for launch. "I think we have a good understanding of our direct customers. Once we become aware of some specific need or other, or see something interesting at the trade fairs, we are always fast to tell them that we would like to work with that. But we don't ask them too much. I emphasize coming to them and presenting a product that is almost finished. But we can see that this is changing a bit. The relationship between the producers and retailers is getting stronger, but we want to keep independent. We are a little afraid of this very close connection. For example, we have this policy that one customer should as a maximum buy 20% of our production. But it's difficult. There are clearly risks concerning both strategies."

Case 5 acquires its market information from direct customers, and the level of knowledge of end-users is low. "Most of our new products are sold to existing customers. Perhaps the end-user is someone new, but I don't know about that. What we know about the end-user is minimal. It's just what we read or what the direct customers tell us. But it's difficult with the information that we get from the retailers. Once they told us that a specific trend would ruin the sales of our products. We rushed home and developed four new products, and after three months the new products were dead. We have some housewives' leagues who visit us every year. They are of course end-users. But I consider general reports on market research of higher value. Our visitors are very much visitors, and they will try to tell us whatever they think we want to hear. We have tried it, but it's clear that what they tell us is not representative at all. I also remember a piece of market research done a few years ago. The researchers stopped people in the supermarket and interviewed them about a specific product. They were all very negative, but the reality was that even if it was a low-quality product, it was the market leader. But no one would admit buying it. So I think it's difficult with market information. More general market research reports come from trade organizations. But apart from that, the money we spend on market research - we spend none."

Organisation of the product development process

Product development is a small function that is integrated into the daily work. "We don't follow up very closely on projects. It's not like anybody will come after us if we said at the start of the year that we would develop three new products and then only make two. But there is a follow-up on the costs. I make weekly accounts, so the costs for a specific project are visible." There is one person in the division with a key position in relation to product development. As the person responsible for the division, he is also responsible for sales, and, informally, the project leader. "I have a number of different roles. The phone keeps ringing - also if I'm down with the flu", and adds, "It can be difficult to allocate time for product development. At the moment I have 35 phone calls and 20 customers who wants a visit. Short-term gets a high priority. That pressure might result in some 'half messages' to somebody working on a project. Sometimes what I get back could have been better, and I think it is my fault because I didn't have enough time to explain what I really wanted." While product development is fairly continuous, there is no formal product development department, and development work is carried out in the production facilities. PD explains: "It can be a bit frustrating, especially if they are very busy. Then you kind of have to make excuses for walking around in there."

"It's often production that takes the initiative concerning improving existing products, whereas new product ideas come from sales." On the initiation of projects: "Sometimes I come home from an exhibition or a trade fair with a new idea that I'm totally hooked on. You develop it, start a production, develop labels and everything, and then... I have made some mistakes sometimes with specialised products for small segments. As soon as the initial push from advertising is over and we don't have time to persuade the retailers to buy it all the time, it ebbs out. Products like that can have a very short life cycle. You could say that if we have a good idea, then we want to launch it to see how it works out. But mistakes like that can be very expensive."

The product development process is not very formalized. It usually involves a very limited number of people who feel they are implicitly familiar with the process, and there is close cooperation between the person responsible for product development and production. Where-as there is no formalized procedure for the development process, projects are continually documented: "We make a file on every project, and information on the recipe and adaptations is documented here. We also document if we tried something that didn't work out. Perhaps we also send it to the laboratory for some tests. When we have developed the product, we make exact calculations of costs. We don't have anything like a development manual. But it's pretty much the same from project to project. Twice a week we evaluate all our products, and if we have a new product we include this for an evaluation. Then perhaps we agree on some changes or improvements and we will continue the work. I would say that we can often make the product itself within a week, but the whole process could take perhaps six months from idea to launch." On concept development: "Now I see what you mean. But it's kind of funny, because here we produce the product first and afterwards discuss where we can market it. But you know, it doesn't take you a year or cost a million to develop it, so you just go ahead and do it." An advertising agency is used for marketing and packaging. This is the last part of a product development project and the phase that is usually the most time-consuming.

Concluding remarks.

In this company, product development is characterized by a very limited number of key persons and a clear strategy (not growth, but product optimization). The pressure on product development is due more to the fact that the key person has to handle a number of functions than actual lack of organization. One thing that stands out, and which could be risky in the longer term, is the low degree of documentation. The company's product development experience is tied to a single person. While the company tries to be market oriented in generating new product ideas, there is no direct customer orientation as in most of the other companies. Products are deliberately not discussed with customers, as case 5 wants the attention which introducing new products gives. Given the declared wish of the company for a low-risk strategy, this seems a rather risky approach.

Case 6

Case 6 is a medium-sized food processing company selling both internally produced products and commodities. The company has a broad product assortment, previously aimed at a small segment, but today aimed at the broader consumer market. Over the past few years the company has experienced changes in ownership, reductions in the number of employees, and a change in strategic focus.

The role of product development

Product development covers both the development of new product lines, minor changes in existing products, and the evaluation of commodities, which are included in the product assortment either under their original name or that of case 6.

Product development is considered very important in this company, since many of the existing products are rather old and trends in the served market change. PD: "Perhaps we could survive without new products. But on the other hand a lot of our products are rather old and aren't sort of up-to-date." SA: "It's definitely important. It's the only way to progress. This is an old well-established company, but if we don't change our products we will die, because that is what happens to our former consumer segments. Right now I think what we do is mainly to copy products. This is not what we want in the longer run. We would like to develop some products that could really give us a push." In spite of the importance attached to product development SA adds: "No, I have no idea how much we actually spend on product development."

A discussion of success rates revealed that 10% of all incoming ideas are initiated as projects. Of these, approx. 75% are launched, with a success rate of only 10%.

PD: "It's difficult for me to say anything about the success rate. It would have something to do with the sales figures, but I don't see these. I know what our really good products are - the ones we produce in large volumes. But where the success is in relation to profit, no I don't know that. On the other hand it would be nice to get some feedback. Then we could perhaps avoid some mistakes in the longer run."

MA: "Our success rate is around 10%. We define success on the basis of sales. When a product is launched and is not very successful, we ask ourselves why. Then we have a discussion about the possible reasons in the management group. And we try to decide what to do with it. It's not like we go out and collect a lot of different information on the reasons."
SA adds: "I think part of the problem lies in the planning - or lack of planning. I don't understand why they don't involve more people. Perhaps they listen too much to marketing or the advertising agency. They can really assure each other that something is going to be a success, because they can see a good idea in it. But if they went to sales with that idea we would perhaps tell them that it was dead. To ask us would only extend the development process by a few days."
Market orientation in product development

The generation of ideas is not a bottleneck in the company, and they come from many different sources, though not from end-users, and only seldom from direct customers. A number of new product ideas come from the CEO, who also represents marketing.

SA: "I would say that many of the ideas come from internal brainstorming sessions. Also repositioning of products. We can get some good ideas internally. But on the other hand, ideas can come from a lot of different sources. Every time we hear of a new idea, we write a short note about it and put it on the CEO's desk, because it's more or less he who decides if it's something we can use. But none of the ideas come from retailers or consumers."

MA: "The ideas come from many places. Mainly from procurement and marketing, but also from sales or other companies who want us to distribute their products. The consumer only reacts when we stop making products. And we don't get any ideas from the retail chains. They just accept a new product or tell us that they don't want it."

PD: "The ideas come from marketing. All ideas have to pass his desk, and he chooses what we should work with."

As far as knowledge of the market is concerned, the company thinks that, in general, it knows its customers well. SA: "We know our direct customers. And we are improving our relationship with them. The company has a good image in relation to end-users. On the other hand I don't think we spend enough on market research. Of course we also get a lot of information from our sales visits, but it's not like we write reports and send them around the company. Of course, if there are specific complaints or praise, we pass it on." PD: "We know that our target is the general consumer, who wants good quality products. But the knowledge we have of the current market situation is very much based on our own experience as consumers. I know we have done some market research in the company. But it's not anything I get."

Marketing input for product development is procured orally or in short notes. PD: "Communication with marketing is to a great extent informal, or (in the form of) short written messages." MA: "I think that product concept and the target market are things that we try to define early in the development process. If it's not done from the very beginning, marketing will let product development know about it. It's product development that writes it down. Communication is primarily oral."

Sales is more or less not involved in the development process. SA: "We don't interview or discuss new products with our direct customers during the development process. I can give you an example of that. Right now we have this new product we are going to launch. They presented this to me just a few weeks ago and it's almost ready for launch. And I'm the one who has to sell it. Had they involved sales earlier we could have presented it in a rough form, and asked their opinion. This could give us an indication of whether they would buy the product." MA explains: "No, I wouldn't say that the knowledge we have about the end-user comes from the sales channel. Neither is sales much involved in product development. Not before we run test sales on the new product. I find that it would be a non-objective evaluation

from single persons, and we don't feel that is strong enough. It's the consumer who should decide how the product is."

PD agrees on the role of sales in the development process: "We have actually no cooperation with sales concerning product development. For example, it's next to never that someone from sales comes to our department. I think it's a shame though, because they could give us a lot of valuable input concerning what goes on in the market at the moment."

Neither end-users nor direct customers are involved in the development process. MA: "No, we don't interview any consumers during development. And we don't discuss the new products with the direct customer either. We have an internal test panel. They sometimes get a new product, and we ask them to test it and give their opinion on taste, texture, and how it looks. We don't ask them about name, packaging, and things like that. No, it's only the physical product."

Market analyses in the form of AIM quarterly reports on food products do exist, but are not used by product development. MA: "We spend very little on actual market research. We get some sales figures and market share estimates, and on the basis of that we try to define next year's activities. At least that's what we do in some product categories. We can get some market information from the sales channel because they report back to us after each sales trip. Sometimes we include some questions for them, eg concerning specific products. And then we follow the sales figures on a day-to-day basis."

Organization of product development

Product development is largely undertaken by the product development department. Other departments, eg sales, don't get involved until the launch, and the marketing input is limited. A project manager is appointed for each project from inside the product development department, and to make the workload more bearable, the projects are given internal priority. PD: "We internally appoint somebody who is responsible for the project. He or she then has to require help from, for example, procurement, production, etc. This can be a long haul."

The department of product development also carries out the documentation of the different projects, but this is only for internal use. On the matter of documentation SA adds: "Of course we have our experience. And this is mostly what we confront each other with when we discuss something. You could say that we ought to learn from our mistakes, but it's not like we write it down in a book."

To ease the work, product development has developed an internal development manual, or "checklist." PD: "We have developed this short instruction concerning the steps in product development, and also for analyzing commodities. We felt a clear need to have something to guide us. But it's just for our own work. It's not used outside this department. We also put a time limit on the projects. We estimate how long this will take and then we set the time limit. Sometimes the time limit comes from the customer, but more often we set it ourselves.

Typically, a project will take us six months. Trying to get the ingredients we want and then scheduling trial production (which has to be coordinated with production) sometimes causes bottlenecks in this process."

In the early phases of the development process, product development also tries to define a general concept and specifications for the product, but feel they lack input from sales and marketing. PD: "It is difficult though to develop a concept. What kind of taste should a specific product have, for example?" There is no formalized project evaluation during development, but an informal, continuous evaluation is carried out.

A low degree of coordination is explained by the fact that neither the person responsible for sales nor the management representative know exactly how the product development process is organized or how many current projects there are. PD: "We have fourteen projects right now. I'm not very surprised if the others don't know that. I often get the feeling that not very many know what we are actually doing."

MA: "I think there are three projects running at the moment", while SA adds: "I don't know how many projects we have right now. And I can't answer your questions on the organization of product development. To be frank I have never quite found out how they do it." And he continues: "I cannot answer your question on the number of people working with product development, because I don't exactly know how they handle things. I've only been here a year."

Product and process development is split up between the product development department and production. PD: "In our department it is product development. As soon as we are talking about the process, it's production or the technical department. If, for example, we are asked to analyze a product idea, we perhaps make a report saying that it's possible to get the raw materials and produce it, but that we don't have the means of packaging it. Then we hear no more, because the decision is made elsewhere."

There is only little coordination between different functions, and only informal meetings are arranged. PD: "We did start a product development group where different functions were represented, and this was really good, but it ebbed out" and continues: "Management meetings? We don't really have meetings between managers of different functions. This is a clear lack. We would like to know on a more regular basis what happens in the other departments, and meetings like that could also solve some problems in the beginning. Often we suddenly hear that 'this product should be finished very soon', and then nobody thought about how it should be packaged." SA agrees: "I have asked for management group meetings where we could discuss what happens in the different departments. I really have no idea what exactly they are doing down there in product development."

MA: "We have worked on a more systematic approach to product development and we have tried different methods. Perhaps we have tried too much instead of just implementing one method, but we have changed our organization and are still changing it... But it's still not really suited to the task."
To a specific question on cooperation between product development and sales/marketing, PD

adds: "I cannot answer a question concerning the cooperation with sales/marketing, because it's very limited. We would like that, but...", and, "It would also be good for us to get some external input. For example, talk to some of our large direct customers or go to some of the trade fairs."

On the degree of planning, MA elaborates: "We do have some general product plans. Our intention is that these are known to the relevant people. But I guess our planning and following-up on development projects is a little too loose. This is where we need some formalization. Everything is there on paper, but in reality it doesn't work out that way." PD: "As I see it we don't plan product development on a longer range. We develop an action plan for each project, but this is something we do internally in product development. But I think we ought to."

Concluding remarks

This company is the only one which clearly had much lower success rates than the others. The company deviates widely from normative advice in all three dimensions. While all respondents attached importance to product development, there was no kind of explicit product development strategy at all. As regards market orientation, the company's target market is so loosely defined that there is no guidance for product development whatsoever. There is a lack of basic understanding of the end-user, and products are not tested on the market before launch. Nor does the company cooperate with direct customers during development. The organization of product development suffers from a number of problems often cited in the literature. Problems with coordination, lack of involvement of different functions during development, and lack of guiding principles for product development. The product development department has tried to organize the work in a more formalized way, but lack of political power meant that this was purely an intra-departmental formalization.

Case 7

Case 7 is a medium-sized food company producing and marketing a number of products within the same product group to both retailers and industrial customers. Annual turnover is approx. DKK 125m, and the firm has 125 employees. The firm is a well-established family firm, 50% of which is owned by a holding company. 30% of sales come from exports. 50% of profits come from a handful of consumer products that, despite some cosmetic changes, eg packaging, have remained basically the same for the past thirty years.

The role of product development

Everyone interviewed claimed that product development is important to the company, especially in the longer run. SA: "I think product development is crucial, especially in the longer term. The life cycle of some of our products is also pretty short, and it is my personal belief that we in the future will be faced with even shorter life cycles." MA: "Product development is important, but primarily in the form of product adjustments like changes in packaging. I think it is important to build on the knowledge we already have."

PD: "I think it's very important. Every company has to move. I think we should emphasize product development more than we actually do."

Product development has been incorporated into the laboratory function, and is mostly carried out as a part of day-to-day work. The laboratory manager had the following comment on the role of product development: "Product development is almost not visible in this company. Some of my time and the monthly development meetings are the direct resources we spend on product development, but apart from that it's done as a part of the daily work. I think it ought to be more clear. Even if we have resources to undertake the kind of projects we do now, I think we ought to be more offensive with our development and then more resources would be necessary."

The emphasis is implictly on shorter-term projects, often initiated by a customer who wants a new product. PD: "Most new products are direct ideas from specific customers, who ask us to do this or that." The majority of the projects can therefore be seen as very low-risk projects with a limited degree of innovativeness. MA: "The majority of what we call product development is in fact variations based on well-known products - but often to new customers or markets", and continues, "no, our customers would not consider us innovative, rather a little dull, but this is because our product assortment is so wide that a few adaptations are not very transparent."

As most projects are initiated by customers, it is difficult to estimate a success rate. MA: "It is difficult with a success rate. It could perhaps be how long the products are on the market, or, of course, turnover or profits, but we don't do this kind of measuring. We look whether there is a turnover. But I can't give you a figure."

A few projects which have been initiated internally, and for which considerable resources have been used, have not been market successes, and are on their way out of the product assortment again. MA: "If you ask me to mention some failures, unfortunately the failures are the projects we have initiated internally and have put a lot of resources in."

There are no product development plans or budgets. Projects that are considered reasonable are initiated. SA: "We don't have any written plans. But I think we have an informal understanding concerning the role of product development." MA: "Usually we don't make specific plans for product development. Right now we have made one for a specific new production unit. Here we have identified a product we want to copy which we hope could give us some sales."

Degree of market orientation

The company is first and foremost production and sales oriented. There is a strong emphasis on internal cost minimization, and a sales orientation towards direct customers, and to only a lesser extent, a thorough understanding of market needs and wants. MA: "I think we know our direct customers, but the end-user we don't know much about. We have done some ad hoc analyses, and our advertising agency also does some market analysis, but there isn't a lot of interaction with the market - apart from the industrial customers." SA: "The kind of market research we undertake doesn't give us inspiration for specific new products. In total we don't spend much on market research. Almost nothing." Even if target groups are defined, this definition is built on beliefs rather than documented evidence. PD: "I think our definition of targets is very broad. This is perhaps because we don't actually know so much about the end-user, but with a more specific target we could also aim much more precisely." SA: "Of course, the products we develop are the ones we feel we can sell. But I guess it's often based on feelings and intuition."

Only very few resources are spent on collecting information about end-users or on testing new products. PD: "Market information comes informally from anyone who is in contact with the customers. But it's not like we document this information. Actually I have never seen any market analysis in this company."

Contact with the market during product development differs according to the customer. Often there is a dialogue with industrial customers. Products for retail customers are not tested on the market before launch. Sometimes a test sale is run in a number of retail outlets, but this is not always the case. MA: "We once developed this product which we believed very much in. We did a lot of test panels - mostly with employees and their friends and family - and suddenly we had a product which everyone liked. We then did a test sale in one town, and it went very well. We launched it, and it was a total flop. So it's difficult with this testing..."

The company participates in a large annual international trade fair, but considers this a purely sales affair, and has not considered collecting information on competition, new trends, etc. Ideas come primarily from direct customers, and apart from that, idea generation is informal.

Organisation of product development

Organizationally, product development is part of the laboratory, and the laboratory manager estimates that he spends about a third of his time on product development.

For the past two years, a product committee representing management, sales, product development and production has been meeting monthly to discuss new and ongoing projects. This group shares the responsibility for product development. MA: "We all make product-development decisions. I think almost all projects are discussed at the development meetings, but it's not a policy, it just happens. The different functions all have a say on the projects. After all, we all know each other, and are constantly in touch with each other." PD: "Most product ideas are almost orders from specific customers. Of course, we can also get some crazy ideas internally, but it's not on the agenda. We just discuss it." The projects are often pushed by the person (often from sales) whose idea it was. SA: "I wouldn't say that anyone has the formal responsibility for projects. We all feel responsible for them. But of course, if I get an idea I will be the one to push it a little bit." Reports from the development meetings and the laboratory manager's informal reports on, among other things, recipes, constitute the only documentation on projects.

There is no formal concept development or screening. MA: "We have this oral briefing where we cover issues like benefits, target groups, competition etc., but nothing written", to which PD adds: "any information concerning these matters which is not there initially is rarely collected and discussed afterwards."

There are no formal product development procedures, checklists, time limits, or formal criteria. MA: "No, we don't have any kind of formal system for that. But we don't often commit the same mistake twice. After all it's the same people working on the projects. But of course there is a danger about this knowledge, it's very much tied to the person in question." PD: "I never give them a specific deadline. I just say I will make it as soon as possible. But if a time limit has been set with the customer we of course try to get it done in time." It is only possible to identify the number of current projects by checking the reports from the meetings, as no overview of projects exists. PD: "We have limited resources, but initiate projects that are sound. Of course, we then sometimes have many projects running at the same time, but sooner or later I will finish them."

Different parts of the projects, eg the recipe and packaging, are coordinated informally. PD: "It can be a bit difficult to define when I actually hand over the project to production. I have the responsibility until the process description is ready, but then if there is trouble, is it then my problem?"

Concluding remarks

In this company, product development is primarily short-term, in the form of product adjustments - often initiated by direct customers. The company has had less success with

projects initiated internally. The role of product development is not specifically spelt out, but is integrated into the daily work. There are no longer-term product development considerations or strategies. The company seems to be more sales oriented than market oriented. Almost no resources are spent on collecting market information. Organizationally, a product committee is the only formalized body dealing with product development. Apart from this, product development is handled with informal coordination, and mostly by oral communication. Again, experience is largely identified with single persons.

3. Conclusions

Tendencies

It should be emphasized from the start that we have not tried to measure success as such in the interviews. As described earlier, current practice is commented on and discussed in relation to the normative implications of previous research. This means, for example, that we do not compare successful and less successful companies, or discuss differences in their product development strategy, market orientation, and organization. Rather the comparison is between practice and normative advice. This study does not constitute an objective measure of the relative success of the companies, but rather an identification of the gaps between practice and normative advice. This could be problematic, especially as research results mainly come from different industries, often from companies with other characteristics (eg larger companies). On the other hand, the interviews have, to a very large extent, revealed that any attempt to measure directly the success of a project or programme in the individual company would have been problematic. Most respondents have had great difficulty discussing the effectiveness of product development as measured by, for example, the number of launched products, success and failure rates, resources spent on product development, etc. This could, of course, be due to secrecy, but all participating companies expressed interest in the project (ie the joint research programme), and it is our impression that they have all been extremely open, also over issues which would usually call for discretion.

Regarding the effectiveness of product development, the majority of the companies have given very similar responses. It should be noted that none of the respondents already had a measure of success based on information from earlier products, very few tried to determine success rates on the basis of actual products, while most gave us their first impressions. Only one firm really stood out with a much lower success rate than the others. As the sample is small, the actual numbers will not be commented on. Furthermore, characteristics of product development, which will be discussed later, imply that it is very difficult to compare the estimated success and failure rates with more general findings.

The role of product development

Practically all respondents have claimed that product development is necessary to ensure competitiveness. While process development and cost minimization generally have a high priority, all respondents consider continuous product development important - and all companies had several projects under development at the time of the interviews. Some of the companies used product development to differentiate their products and avoid the fierce price competition of more generic products. While product development is considered important, the amount of resources used, both financial and human, is often very limited. The emphasis is on projects with a low degree of innovativeness - and very often projects are initiated on the direct request of, or in close cooperation with, direct customers. A few of the companies had also embarked on a project of more long-term or strategic importance. Usually a project like that would account for a large percentage of the resources spent on product development.

Only one of the companies had a clear and, to a certain extent, well-formulated, product development strategy with a long-term goal and related to a long-term project.

The most frequent picture was of incremental product development with a short-term aim. With few exceptions, the role of product development was considered to be joint informal knowledge, and even those companies which had formal strategic planning did not have an explicit product development strategy. This is certainly contrary to general normative advice. Some respondents argued that, as the number of persons involved in product development is usually low, it is possible to handle things informally. On the other hand, without a formulated product development strategy, it is not possible to evaluate product development continuously, since there is nothing to compare it with. Furthermore, there is a risk that specific development competences, which will greatly affect the future ability of the product development function, are formed more by incidental initiatives from customers than on the basis of a defined goal.

The development process largely focuses on the physical product - the recipe - while other parts of the product mix, eg packaging, market positioning and market communication, have a lower priority, and are often dealt with in the very last stages of the development process, in many cases almost as an afterthought.

Short-term projects, which are often initiated by, or in very close contact with, direct customers, have a very limited risk of failure, since the company is practically guaranteed a market. In companies where the majority of projects are initiated in this way, it is very difficult to discuss success rates, and even more so to compare them with more general findings. On the other hand, in general little attention was paid to the possible strategic or long-term implications of such customer-initiated projects.

Market orientation

Market orientation, as it is most often defined in product development studies, ie development based on an understanding of the needs and wants of consumers, is generally given a low priority in the food companies surveyed. Companies get most of their market information from direct customers (retail chains, agents, or industrial customers), and only very rarely, and somewhat at random, directly from end-users. A majority of the companies focus very much on the direct customer and presume that, since the food processing companies and their direct customers, eg retailers, have the same overall interest, the latter will supply them with the needed or existing market information. They have no thorough understanding of either the needs and wants of end-users or the use of the product. Some of the respondents pointed out that, if market orientation is defined as an emphasis on collecting and using market information, then it naturally has a low priority in the food industry, since eating patterns and food habits change only marginally. Many emphasized their own experience as the main screening tool for new projects. Most companies are market oriented, however, in the sense that they have close relations with direct customers. On the other hand, most of these very close contacts resulted in customer-adapted products very close to existing products, which

makes it difficult to draw the line between actual product development and direct orders. However, there were also examples of products with a higher degree of innovativeness which had been developed in very close cooperation with direct customers.

Some of the products which resulted from internally generated ideas were never tested on the market before launch. In one case this was due to an implicit strategy which emphasized the ability to present new products to customers on sales visits. In another case it was very difficult to find a reason - but perhaps an extremely broadly-defined target market meant that the company had difficulty in identifying the end-users in the first place. Several respondents also referred to the fact that the development of a new product was often not a very complicated process. Once you had the idea, you were just tempted to go ahead and launch the product and see whether it succeeded or failed.

None of the companies had marketing departments as such. Marketing is handled in the sales function, which generally has a sales-oriented, short-term focus. This kind of product development is therefore more sales oriented than market oriented, with a strong emphasis on the short term. It also involves a great deal of trust or dependency on the relationship with direct customers, since they have such a great influence on the future abilities of food processing companies to develop new products.

The organization of product development

The product development function is very often placed under either the laboratory function or quality assurance. Only a minority of the companies had independent product development functions. Since the companies are small by international standards, management is usually heavily involved in product development. While management support is considered a success factor in the literature, direct interference is often considered an impediment to successful product development. We only identified potentially obstructive interference from management in a few of the companies. One example was of a board of directors interfering in operational levels. Another was of a general manager who was also responsible for marketing. He seldom had time to engage in product development issues, and became a bottleneck in product development.

There seems to be a tendency towards increased formalization the larger the company, but in general, the organization and coordination of product development is very informal. Most companies had some kind of product committee, however, made up of management, product development, production, and sales/marketing representatives, where major or all projects were discussed and evaluated. In most companies this was a fairly recent arrangement. A minority of the companies have developed project plans, and only few evaluate projects on the basis of pre-defined criteria, use a development manual, or have any other kind of project management.

Organizationally, two types of development projects can be identified:

- One initiated either directly or in close cooperation with the direct customer, and based on estimations of expected volume and price. This kind of project involves only a low degree of risk. There is a high degree of cross-functional cooperation between sales and product development.

- One initiated by the company. The informational basis for initiating this kind of project varies, but is often based on the feelings and experience of management. To a large extent, this type of project is implemented without any direct market input as regards project evaluation, and these products are not confronted with the market before test sales or direct launching.

In some of the companies, lack of communication between departments has been a problem, but product development is generally well-integrated and builds on broad, informal, cross-functional cooperation. Documentation and project follow-ups are generally given a low priority. A large part of a company's product knowledge is not documented, but is either tied to single persons or considered joint informal knowledge.

Concluding remarks and implications for the future

In summary, the gap between the practice of the food companies in the study and the normative implications of previous research includes:

- the lack of an explicit product development strategy. Among other things, this is exemplified by the fact that there was no order of priority for different kinds of projects.
- disagreement concerning the role of product development in the company.
- too much emphasis on short-term projects, while longer-term development is often not considered explictly.
- low degree of documentation. This can be particularly problematic in the case of new employees.
- emphasis on the core product while other areas of production receive less attention.
- problems of cooperation/communication between different functions.
- lack of understanding of the needs and wants of end-users.

Compared with the problems often identified in previous studies, however, there were also some positive aspects. First, cooperation between functions is usually close, with a great deal of informal interaction. One of the reasons given for this in the interviews was that there are only a few key persons and that they also work in close proximity to each other. This makes decision-making very fast and flexible. Another implication is that product development decisions are often reached with inputs from different functions.

Secondly, several of the companies develop new products in very close cooperation with their direct customers, and in this sense can be considered market oriented. On the other hand, part of this kind of product development is very close to order production, and is therefore not market oriented in the usual sense of the term. Furthermore, since by far most market infor-

mation comes from direct customers, the companies could become very dependent on this source.

In product development literature, the development process is often described as consisting of different phases. During the interviews, it became clear that respondents often had difficulty in relating the practice of their company to this concept. Ideas are either generated informally or by customers. The emphasis is on actual development of the product. This process varies greatly in time, but many projects, which can be seen as incremental changes or modification, can be undertaken relatively quickly and inexpensively, often within one month. In fact the development phase often seems the most straightforward, and the one phase that is very quickly initiated. Market-related considerations, such as product benefits, market positioning (normatively included in the concept development phase), etc, are either carried out informally, eg through discussion at a product development meeting, or at the very end of the product development phase, eg by an advertising agency.

The case studies described above have revealed details on the practice and special problems of seven Danish food processing companies. As pointed out, the practice of these companies has been compared with a frame of reference consisting of the normative implications of previous studies. The overall conclusion is that, in a number of respects, the companies do not live up to these normative standards.

One of the implications of the study, therefore, is that these companies should try to close the gap between current practice and normative advice. As stated earlier, this is indeed the next step of the research project, in which we will seek improvement of the product development functions through implementation of research-based methods and techniques.

It should also be noted that, in studies such as this, general conclusions are impossible. This applies to generalizations about both food industry practice and product development practice. The tendencies revealed in this study should therefore be examined more closely in a broader, quantitative survey of the product development practices of companies in the food industry compared with those of companies in other industries.

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Appendix A

Design of the questionnaire

In the questionnaire, which formed the basis of the interview, questions are based on the results of previous research, and we have tried to cover success factors in the three categories as thoroughly as possible.

Some of the questions in the interview are related to more than one of the conceptual categories.

It should also be noted that an important part of the case descriptions are attributable to the fact that the same questions have been posed to several respondents in each company.

In addition to the interviews, we have also tried to ascertain the degree of market orientation by asking: (i) whether new products are based on existing process technology (to test the proposition that companies which are limited by existing process technology are generally less market oriented); (ii) whether new products are aimed at existing or new segments (to test the proposition that companies which never sell to new markets or segments are less market oriented); (iii) the extent to which the company has an understanding of direct customers and/or end-users, and how this knowledge is used in the development process; (iv) where the company obtains its market knowledge; (v) whether and how persons with market knowledge influence product development; (vi) whether different methods are used to ensure market orientation in the development process (market research, interviews with direct customers or end-users, concept tests, trial sales, etc.); and (vii) where new product ideas originate from.

In the interviews themselves, we have tried to cover the category "product development strategy" in two steps. First, we have tried to get an impression of the relative importance of product development in the company. We have done this by asking a number of general questions concerning the number of current projects, the degree of product development, the types of new products, the importance attached to new products, the existence and size of a development budget, the perceived innovativeness of the company relative to competitors, the rate of success and success relative to competitors.

A number of more specific questions were aimed at uncovering the role of product development in the company. These included questions on the role of product development today and in the future, the planning of product development, the existence of either a formulated product development strategy or a clear role for product development in the general strategy, the degree of evaluation and documentation of efficiency of product development, the degree of management involvement, and the amount of resources allocated to product development.

With regard to the organization of product development, we have specifically covered such areas as the organizational unit which carries out product development (how many are involved, is there a specific department, what other departments participate, and how), responsibility for product development, the existence of an idea-generation system, the degree

of formalization in the development process (eg is there a product development manual), the existence of a defined product development process, specification of activities for different parts of the process, project evaluation, the existence of defined evaluation criteria, the definition of the product concept, product advantages and target groups, whether there is systematic documentation, whether a project leader is assigned, the length of typical projects, and cooperation between product development and sales/marketing.

Apart from the questions in the questionnaire, we have also discussed actual examples in a number of the interviews, thereby elaborating the topics in a more process-oriented manner.

Appendix B

Questionnaire

Markedsorienteret produktudvikling

Til
- en repræsentant for ledelsen
- en repræsentant for produktudviklingsafdelingen
- en repræsentant for marketing

Med henblik på en beskrivelse og vurdering af virksomhedens produktudviklingsfunktion, ønsker vi at gennemføre et interview med hhv. en repræsentant for ledelsen, produktudvikling og marketing. Vedlagt er en spørgeramme for interviewet.

Med henblik på det største udbytte for alle parter, vil vi bede dig orientere dig i spørgerammen og overveje spørgsmålene forud for interviewet (skriv gerne dine umiddelbare kommentarer ned). Selve interviewet bliver en diskussion og uddybning af de enkelte spørgsmål.

Spørgerammen er bygget op omkring fire generelle områder:

1. En generel beskrivelse af omfanget, arten og resultaterne af produktudviklingen.

Med denne gruppe spørgsmål vil vi gerne afklare, hvilken type produktudvikling virksomheden beskæftiger sig med, og hvilken økonomisk betydning udvikling og markedsføring af nye produkter har for virksomheden.

2. Produktudviklingens strategiske rolle i virksomheden.

Med denne gruppe spørgsmål forsøger vi at afdække, hvilken rolle og betydning produktudviklingen har i virksomheden i dag og om produktudviklingsbeslutninger indgår i den langsigtede planlægning. Herunder forsøger vi at vurdere, hvorvidt produktudvikling anses for et kerneområde i virksomheden.

3. Kunde- og markedsorientering i produktudviklingen.

I denne kategori vurderer vi, hvorvidt nye produkter er baserede på kundebehov. Også virksomhedens anvendelse af forskellige metoder til at sikre markedsorientering i produktudviklingen undersøges. Det skal tilføjes, at begrebet "kunde" ikke blot dækker virksomhedens direkte kunde, men i lige så høj grad slutforbrugeren.

4. Organisering af produktudviklingen.

Her vil vi gerne opnå en forståelse af, hvem der er med i produktudviklingen, hvordan udviklingsprocessen organiseres og ledes, hvilke gennemløbstider virksomheden traditionelt arbejder med og hvorledes samarbejdet mellem de involverede afdelinger fungerer.

Hvad er et nyt produkt?
For klarhedens skyld vil vi indledningsvis afklare, hvad vi mener med "et nyt produkt". Der er tale om et nyt produkt, såfremt en kunde (det være sig en industriel kunde, distributør, detailhandel eller slutforbruger) oplever en ændring i forhold til tidligere udbudte produkter, fx fordi:

- produktet er helt nyt
- emballagen er ny og mere funktionel
- selve produktet er forbedret

Spørgeramme

1. Beskrivelse af omfang, arten og resultaterne af produktudviklingen.

1. Er introduktionen af nye produkter afgørende for virksomhedens konkurrenceevne?

2. Er omsætningens andel af nye produkter inden for de sidste tre år stigende, uændret eller faldende?

3. Omtrentligt hvor stor en andel af omsætningen anvendes til produktudvikling?

   Hvordan opgøres disse omkostninger?

4. Hvordan er fordelingen mellem ressourcer brugt til produktudvikling og ressourcer brugt til procesudvikling (udvikling af produktionsteknologien)?

5. Udvikles nye produkter generelt på grundlag af eksisterende teknologi?

6. Henvender nye produkter sig generelt til nye kundegrupper og/eller nye geografiske markeder?

7. Hvilke typer produktudvikling har været mest dominerende, hvis man ser på virksomhedens lanceringer de sidste 5 år.

   - repositioneringer (fx ny emballage eller markedskommunikation)
   - omkostningsreduktion af nuværende produkter
   - forbedring af nuværende produkter

- nye produkter for virksomheden
- helt ny produkttype for markedet

8. Hvor mange produktudviklingsprojekter er virksomheden pt i gang med?

9. Hvor mange af de seneste 10 nyskabelser på vort definerede marked står virksomheden for?

10. Hvor mange står hovedkonkurrenten for?

11. Hvor stor en andel af igangsatte projekter lanceres? (Med igangsatte projekter forstås projekter, som er formuleret og hvortil, der er nedsat en projektgruppe)

12. Hvor stor en andel af de lancerede projekter kan man betegne som kommercielle successer?

13. Er virksomhedens produktudviklingsprogram mere eller mindre succesfuldt end den nærmeste konkurrents?

2. Produktudviklingens strategiske rolle i virksomheden

14. Hvilken rolle spiller produktudviklingen i dag, og hvilken rolle ønskes?

15. Hvordan planlægges produktudvikling?

   - ud fra overordnede strategiske planer (fx med produktplaner for nye produkter 1-4 år frem i tiden)
   - med målsætning og opfølgning (fx med konkret måling af indsats og resultater)

16. Er der en formuleret produktudviklingsstrategi (fx med beskrivelse af ønskede produkt-områder, markeder eller teknologier)?

17. Er produktudviklingens rolle klart defineret i virksomhedens overordnede strategi?

18. Vurderes og dokumenteres effektiviteten af produktudviklingen (følges der fx op på projekter i form af konkrete målinger)?

19. Hvem i organisationen tager produktudviklingsbeslutninger?

20. Er der tilstrækkelige ressourcer til at gennemføre projekterne?

21. Er ledelsen involveret i gennemførelsen af projekter (tager del i daglige aktiviteter)?

3. Kunde- og markedsorientering i produktudviklingen

22. Har virksomheden en god forståelse for dens kunder og markeder?

23. Kommer viden om kunderne primært fra salgskanalen?

24. Har personer med indsigt i kundebehov stor indflydelse på produktudviklingen?

25. Hvor stor en andel af udviklingsomkostningerne bruges på analyse af kundebehov og markedsforhold?

26. I hvor stort omfang anvendes følgende metoder til sikring af markedsorienteringen, når et nyt produkt skal udvikles eller lanceres?

   - markedsanalyser
   - interviews af direkte kunder
   - interviews af slutforbrugere
   - test af nye produkter (koncepttest, produkttests, test af markedsføringsmaterialet).

27. Kommer ideer til nye produkter fra

   - marketingafdelingen
   - sælgere
   - direkte kunder
   - slutforbrugere
   - andre

4. Organisering af produktudviklingen.

28. Hvor mange medarbejdere fra det enkelte funktionsområde er involveret i produkt-udvikling (hhv. ledende og assistenter)?

   - produktudvikling
   - marketing / salg
   - produktion

29. Hvem har hovedansvaret for udvikling af hhv. helt nye produkter og tilpasninger eller repositionering af eksisterende produkter?

   - produktudviklingsafdeling
   - produktionen
   - projektgrupper
   - marketingafdeling

30. Findes der en systematisk forslagsordning til nye produktideer?

31. Bruges der i udviklingsprojekterne en formaliseret procedure (fx udviklingsmanual)?

32. Opdeles udviklingsprocessen i en række faser?

33. Er der for de enkelte faser specificeret delaktiviteter?

34. Vurderes projektet ved fasernes overgang?

35. Er kriterierne for vurdering af projektet klart definerede?

36. Er produktkoncept, produktfordele og målgruppen specificeret (fx skriftligt) inden konkret udvikling?

37. Opsamles der systematisk erfaringer fra den enkelte udviklingsproces? (fx i form af skriftlige rapporter)

38. Er forskellige funktionsområder involveret i projektets forskellige faser?

39. Findes der en projektleder, som er ansvarlig for det enkelte projekt gennem hele forløbet?

40. Hvad er typiske gennemløbstider for de enkelte faser i produktudviklingen?

  - erkendelse af behov
  - konceptudvikling
  - udvikling/konstruktion
  - introduktion/lancering

41. Samarbejdet mellem marketing og produktudvikling:

  - der er stort set ikke noget samarbejde,
  - der er ofte konflikter i samarbejdet, man har svært ved at forstå hinanden,
  - samarbejdet fungerer generelt godt.

MAPP publications

MAPP working papers

No. 1: Grunert, K. G. & Baadsgaard, A. *Market-based process and product innovation in the food sector: A Danish research programme*, January 1992.

No. 2: Thøgersen, J. *Fødevareinnovation og emballage - miljøkonsekvenser og forbrugerreaktioner*, Marts 1992.

No. 3: Bonke, J. *Choice of foods - allocation of time and money, household production and market services*, September 1992.

No. 4: Grunert, K. G. & Ellegaard, C. *The concept of key success factors: Theory and method*, October 1992.

No. 5: Harmsen, H. *Determinanter for produktinnovationssucces,* November 1992.

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The Mapp programme consists of the following 15 projects

1. Strategic Planning and Innovation Capability in the Danish Food Sector
   Morten Kvistgaard & Kirsten Plichta, Copenhagen Business School; Lone Rossen, Biotechnological Institute

2. Innovation Capability as a Key Success Factor
   Klaus G. Grunert & Hanne Harmsen, The Aarhus School of Business

3. Quality Certification as a Key Success Factor in International Marketing of Food Products
   Niels Jørgensen & Erik Lund, Business University of South Jutland

4. Definition of the Sales Potential for a New Food Product to be Launched on Home or Foreign Markets
   Anne Martensen & Kenneth Kæregaard, Copenhagen Business School

5. Primary Producers and Product Innovation in the Food Industry
   Villy Søgaard, University Centre of South Jutland

6. Controlling Processes of Production to Guarantee Process Characteristics Demanded by Consumers of Food Products: Paradigms and Danish Experiences
   Esben Sloth-Andersen, Aalborg University Centre

7. The Role of the Distribution System in Product Innovation
   Hanne Hartvig Larsen & Nick Norman Jensen, Copenhagen Business School

8. Prototyping in the Danish Food Industry
   Preben Sander Kristensen & Elsebeth Holmen, Aalborg University Centre

9. Product Quality and Consumer Preferences: Assessing the Optimum Design of Food Products
   Kai Kristensen, Hans Jørn Juhl, Anne Bech & Erling Engelund, The Aarhus School of Business; Carsten Stig Poulsen, Aalborg University Centre

10. Product Innovation and Packaging in the Food Industry - Environmental Consequences and Consumer Reactions
    John Thøgersen & Tino Bech-Larsen, The Aarhus School of Business

11. The Consumer as Agent in Relation to Research and Development in Food Technology
    Erling Jelsøe, Birgit Land & Jesper Lassen, Roskilde University Centre

12. Households' Choice of Foodstuffs with Different Kinds of Preparation
    Jens Bonke, University of Copenhagen

13. The Cultural Dimensions of Food Consumption and the Implications for Strategy Formation and Implementation in Small and Medium-sized Danish Companies
    Dominique Bouchet, Josette Andersen, Søren Askegaard, Tage Koed Madsen & Per Østergaard, Odense University

14. Market Surveillance Systems for the Food Sector
    Klaus G. Grunert & Karen Brunsø, The Aarhus School of Business

15. Identification of Key Success Factors
    Klaus G. Grunert & Elin Sørensen, The Aarhus School of Business