

10

Empirical Results – PUIN Focus Group Meetings

This chapter presents the results of the semi-structured focus group meetings held in the PUIN network group focusing on network based high speed product development. The focus group meeting had been refined to comprise 10 focus group meetings held during 2001 and 2002. At these meetings different themes of NB HS NPD have been discussed. The chapter documents the results of these discussions together with the book Network Based Product Development which also documents the empirical results and the industry's own writing on NB HS NPD. The results of the semi-structured focus group meetings showed the businesses' involvement in NB HS NPD and the way in which they worked with NB HS NPD. The chapter gives some in-depth empirical results which the researcher could not have gathered through case research, survey, or other empirical observations.

10.1 Introduction

On the basis of ten exploratory semi-structured focus group studies carried out in SME businesses the empirical focus group results can be presented. All businesses took part in the semi-structured focus group meetings together with 3 researchers from CIP. An example of a meeting agenda and a semi-structured questionnaire can be found in Table 10.1.

In Chapter 2 the methodology of these focus group interviews was described in details. The focus group interviews were supported by questions filled out by the businesses beforehand, news group discussions, and telephone interviews to give additional support and discussions on specific questions.

The businesses' general profiles can be found in appendix together with their website addresses.

Table 10.1 General themes and agendas for focus group meetings

| General Theme and Agenda for the 10 Focus Group Meetings |
|--|
| General conditions and Trends in PD |
| The task of PD – Radical or incremental |
| Enablers to NB HS product development |
| The core of a HS PD project |
| HS PD models and networks |
| Success criteria of HS PD |
| Time and HS PD |
| Speed and HS PD |
| Cost and HS PD |
| Performance and HS PD |

The individual focus group interview meetings have had 10 different agendas or themes which were:

Each agenda will be described and analysed within the framework model of the network based high speed product development prepared in Chapter 8.

The aim of the chapter is:

- to verify, test and give answers to the research hypotheses and questions set up earlier in Chapter 1.
- to show and verify different NB HS NPD aspects carried out under different characteristics in the field of product development
- to show different SME businesses' solutions to and reflections on NB HS NPD
- to reflect on the different consequences which high speed and right speed would have on different parameters as shown in Table 10.2

Table 10.2 Consequences of high speed/right speed

| Consequences | High Speed | Right speed |
|--------------|------------|-------------|
| Time | | |
| Cost/Value | | |
| Performance | | |
| Market fit | | |
| Risk | | |
| Security | | |

In Table 10.3 the contributions of each focus group meeting to the research questions are shown.

A brief introduction to the focus group meetings and the way in which they were conducted is given below.

Table 10.3 Hypotheses to be verified

| Empirical Results – Focus Group Interview | | | | | | | | | | |
|---|--|---|--|--|--|--|--|--|--|--|
| Meeting 10 | Performance and HS PD | | | | | | | | | |
| Meeting 9 | Cost and HS PD | | | | | | | | | |
| Meeting 8 | Speed and HS PD | | | | | | | | | |
| Meeting 7 | Time and HS PD | | | | | | | | | |
| Meeting 6 | Success Criteria of HS PD | | | | | | | | | |
| Meeting 5 | HS PD Models and Networks | | | | | | | | | |
| Meeting 4 | The Core of a HS PD Project | | | | | | | | | |
| Meeting 3 | Enablers to NB HS PD | | | | | | | | | |
| Meeting 2 | The Task of PD – Radical or Incremental | X | | | | | | | | |
| Meeting 1 | General Conditions and Trends in PD | X | | | | | | | | |
| | Overall Research Questions to be Verified | | | | | | | | | |
| | What is network based high speed NPD? | | | | | | | | | |
| | What enablers to NB HS PD can be identified? | | | | | | | | | |
| | What framework models and processes in the idea and concept stage/gate of HS PD based on networks can be measured? | | | | | | | | | |

(Continued)

Table 10.3 Continued

| Empirical Results – Focus Group Interview | |
|---|---|
| Meeting 10 | Performance and HS PD |
| Meeting 9 | Cost and HS PD |
| Meeting 8 | Speed and HS PD |
| Meeting 7 | Time and HS PD |
| Meeting 6 | Success Criteria of HS PD |
| Meeting 5 | HS PD Models and Networks |
| Meeting 4 | The Core of a HS PD Project |
| Meeting 3 | Enablers to NB HS PD |
| Meeting 2 | The Task of PD – Radical or Incremental |
| Meeting 1 | General Conditions and Trends in PD |
| | Hypothesis to be Verified and Tested |
| | The radical and the incremental PD projects follow different generic HS PD models and processes and can thereby be described by different generic frameworks. |
| | The success criteria for HS PD are dependent on the specific PD project – radical or incremental. |
| | HS PD success criteria can be formulated as short term and long term success criteria. |
| | Time, costs, and performance are central success criteria in a short-term perspective. |
| | Continuous improvement (CIM), continuous innovation (CI), and learning are central success criteria in a long term perspective so reach right time, right cost and right performance in NB HS PD. |
| | Overall Research Questions to be Verified |
| | What success criteria can be used for measuring HS PD based on networks? |

10.2 Focus Group Meetings

The meeting was held either at the CIP Centre in Aalborg or at one of the businesses. When meetings were held at the CIP Centre, one researcher introduced the theme for the focus group meeting by introducing the theoretical work and theoretical view from different researchers in the world on the specific theme. Subsequently, the discussion began in the focus group and the researchers introduced the first question of the focus group meeting. The researchers observed the discussion between the businesses and introduced a new question from the semi-structured questionnaire when appropriate.

When meetings were held at the businesses, the host business showed the visiting businesses around the premises after which they introduced their business. Subsequently, the host business gave a short introduction to the theme on the agenda and explained how they work with this theme in their business. This introduction introduced the focus group interview and discussion which was reflected on and concluded by one of the researchers.

10.3 General Conditions and Trends in PD

The focus group businesses' product portfolio was strongly focused on physical and service products. However, on the new product introduction a stronger focus on knowledge and consultancy products could be seen. The businesses claimed that the products moved from purely focused on physical products to immaterial products.

The businesses saw a trend and reaction from the market on more needs and wants for knowledge and consultancy products as seen in Table 10.4. Many of the businesses were just beginning to penetrate this product potential. The decrease in service product development should mainly be seen as a result of the businesses' former strong development in this area. Additionally, the existing service products could probably already or with incremental development solve the customers' demands for service products.

Table 10.4 Focus on product types

| | Physical Products | Service Products | Knowledge and Consultancy |
|----------------------------|-------------------|------------------|---------------------------|
| Existing product portfolio | 83,5 | 15,0 | 1,5 |
| New products | 83,0 | 8,5 | 8,5 |

When looking at the businesses' products in another dimension, it appeared that today 86% of the products are physical products, 13% were digital

products, and only 1% are virtual products as seen in Table 10.5. This meant that hardly any of the businesses had yet begun to offer virtual products to the market.

Table 10.5 Focus on products and processes

| | Physical Products | Digital Products | Virtual Products |
|----------------------------|--------------------|-------------------|-------------------|
| Existing product portfolio | 86 | 13 | 1 |
| | Physical processes | Digital processes | Virtual processes |
| | 83 | 16 | 1 |

Up to 2003, the business had 83% on physical processes and 16% on digital processes.

The focus group interviews showed very clearly that the businesses did not think of the product as a process. The product to process thinking and enabler was not yet introduced in the businesses. The businesses still saw the products as physical “encapsulated” products with a start and an end – products with the classic life-cycle.

The focus group businesses were asked to make general comments on their view of the conditions in “the field of product development”. These comments are collected in Table 10.6 which also present a detailed presentation of the comment.

Table 10.6 Comments on conditions in “the field of PD”

| The Main Components | |
|-----------------------|--|
| Context | Characteristics |
| Market | Most SMEs claimed that they were operating in stable to evolving market with customers who have mostly incremental development in preferences. |
| Stable markets | |
| Evolving markets | |
| Dynamic markets | The businesses claimed that their markets were under pressure of new evolving and some times unknown technologies. The technology gave the businesses new technological possibilities but the technological possibilities were often ahead of market demand. |
| Technology | |
| Stable technology | |
| Evolving technologies | The businesses general involvement in networks was mainly based on physical and stable, narrow networks often internal and dominated network. |
| Dynamic technologies | |
| Dynamic technologies | |
| Network | However, a slightly new evolvement of networks based on a mix of new evolving system of networks – both physical networks and ICT networks were recognized. None of the businesses were joining virtual networks. |
| Stable networks | |
| Evolving networks | |
| Dynamic network | |

Table 10.6 Continued

| | |
|-----------------------------|---|
| Business competence context | <p>Only very few of the businesses joined networks based on a mix of dynamic networks with a high degree of dynamic where network partners constantly come and go. None of the businesses had joined a network with no formal network leader.</p> <p>The businesses felt that there was a high pressure on support competences and that they had to develop on complementary competences either by internal development or by external recruiting in their networks. A high pressure on the businesses' core competences were realised and some of the businesses felt that their competitive advantage on core competences was reduced or diminished by competitors.</p> |
|-----------------------------|---|

This gave the following framework picture as shown in Figure 10.1:

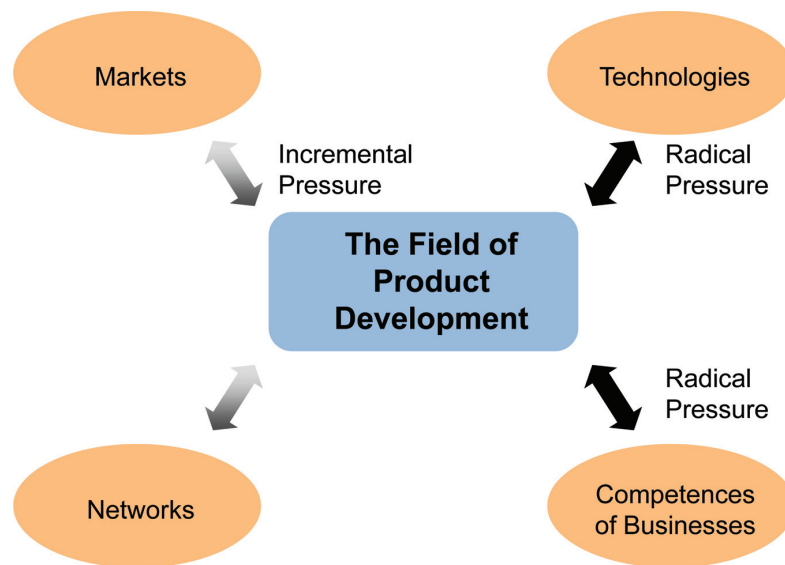


Figure 10.1 Field of product development.

10.3.1 Product Development Tasks

On the basis of the focus group interviews the businesses' task of product development could be verified as seen in Table 10.7.

Table 10.7 Product development task of focus group businesses

| | Physical Products | Service Products | Knowledge and Consultancy |
|----------------------------|-------------------|------------------|---------------------------|
| Existing product portfolio | 83 | 15 | 2 |
| New products | 81,5 | 9,5 | 9 |
| Product development | 81 | 8 | 11 |

Of the business’s product development tasks 81% could be related to hardware or physical products whereas 19% could be related to service and knowledge products. Obviously, the businesses’ product portfolio mainly focused on physical products and service products today as seen in Figure 10.2.

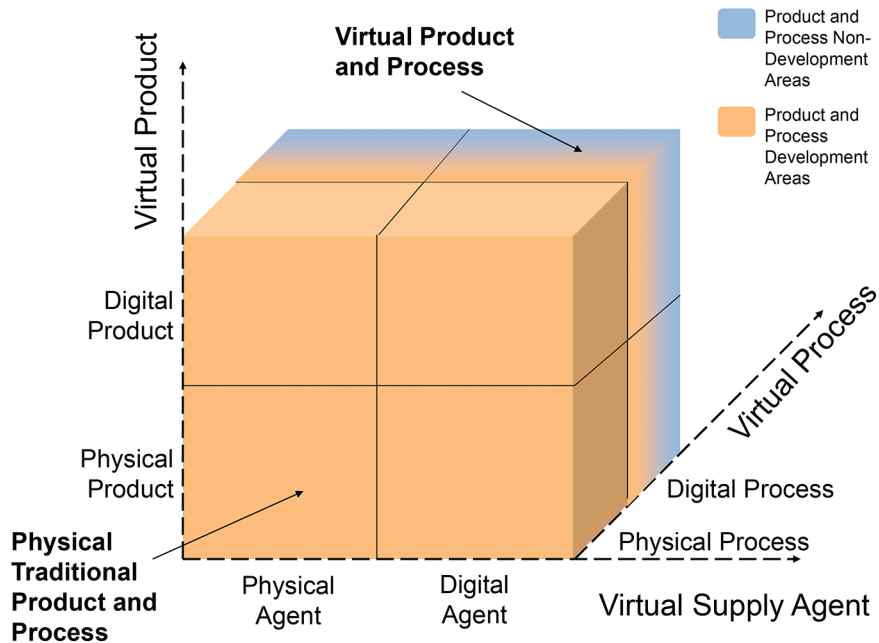


Figure 10.2 PUIN group product/process development focus.

However, the introduction of new products and the product development efforts were now changing and focusing more on knowledge and consultancy products.

The businesses also claimed that product development projects could in general be divided into 80% strategic known and old areas and 20% unknown and new areas as seen in Table 10.8.

Table 10.8 PD projects in relation to strategy

| | Strategic Areas | | Market | Technology | Network | Business |
|---------------|--------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|
| | Known an Old Areas | Unknown and New Areas | | | | |
| Lyngsø | 40 | 60 | Evolving and dynamic | Dynamic | Evolving and dynamic | Evolving and dynamic |
| Linco | 80 | 20 | Evolving | Evolving | Stable and evolving | Evolving |
| AKV | 95 | 5 | Stable | Stable | Stable | Stable |
| B&O | 80 | 20 | Evolving | Evolving and dynamic | Stable and evolving | Evolving |
| Danfoss | 95 | 5 | Stable and evolving | Evolving and dynamic | Stable and evolving | Evolving |
| NEG Micon | 90 | 10 | Stable and evolving | Evolving and dynamic | Stable and evolving | Evolving |
| Ansager | 90 | 10 | Stable | Stable | Stable | Stable |
| Scanito | 80 | 20 | Stable and evolving | Stable and evolving | Stable and evolving | Stable and evolving |
| GSI | 85 | 15 | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic |
| Grundfoss | 70 | 30 | Stable and evolving | Evolving and dynamic | Stable and evolving | Stable and evolving |
| Total Average | 80 | 20 | | | | |

Nevertheless, there were considerable variations in the businesses' product development activities. It was verified that the focus in PD was very much related to the characteristics of the specific elements on "the field of product development". It was verified that those businesses who face evolving and dynamic characteristics on their elements on the field of product development had more focus on unknown and new strategic areas. They were influenced and pressed by elements from outside to focus their product development on unknown and new strategic areas; in other words, a push towards more radical product development activities. It also seemed as if these businesses felt a higher pressure on speed and time in product development.

When applying the product/market model to the product development projects of the businesses, it appeared that product development projects at the businesses could generally be characterized as incremental product development.

Additionally, the businesses' product development projects were mainly development of old products more than three years old.

The data showed evidence of previous statements about a diminishing product lifecycle. 48% of the businesses' products needed product development after 1 year. In an overall perspective, 49% of the businesses' products needed big redevelopment and 48% of the products needed redevelopment after 1 year's lifetime. This indicates a pressure on product development at the businesses in 2003 as seen in Table 10.9.

Table 10.9 Product development in relation to product

| | |
|--|-----|
| Average need of product development after 1 year | 48% |
| Average need of big redevelopment in products | 49% |
| Average products need for redevelopment after 1 years lifetime | 48% |

The focus group interviews showed that there were considerable differences in the pressure on product development from one business to another and that the characteristics in the field of PD exceeds influence on this pressure for speed in product development. Dynamic and evolving elements in the field of product development increase the pressure on the product development of the businesses.

The focus group interviews also show that 82% of the product development in the businesses – Table 10.10 – was on known and old customer groups. This verified the incrementalness on account of which the customers were going to buy the product development of the businesses in the future.

Table 10.10 PD in relation to customer groups and needs

| | Known and Old Customer Groups | | Unknown and New Customer Groups | | Market | Technology | Network | Business Competences |
|---------------|-------------------------------|--------------------|---------------------------------|--------------------|----------------------|----------------------|----------------------|----------------------|
| | Known Customer Needs | Old Customer Needs | Unknown Customer Needs | New Customer Needs | | | | |
| Lyngsø | 40 | 40 | 60 | 60 | | | | |
| Linco | 90 | 80 | 10 | 20 | Evolving and dynamic | Dynamic | Evolving and dynamic | Evolving and dynamic |
| AKV | 90 | 95 | 10 | 5 | Evolving | Evolving | Stable and evolving | Evolving |
| B&O | 80 | 50 | 20 | 50 | Stable | Stable | Stable | Stable |
| DANFOSS | 95 | 95 | 5 | 5 | Evolving | Evolving and dynamic | Stable and evolving | Evolving |
| NEG MICON | 95 | 90 | 5 | 10 | Stable and evolving | Evolving and dynamic | Stable and evolving | Evolving |
| Ansager | 90 | 80 | 10 | 20 | Stable and evolving | Evolving and dynamic | Stable and evolving | Evolving |
| Scanio | 70 | 70 | 30 | 30 | Stable | Stable | Stable | Stable |
| GSI | 90 | 80 | 10 | 20 | Stable and evolving | Stable and evolving | Stable and evolving | Stable and evolving |
| Grundfoss | 80 | 65 | 20 | 35 | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic |
| Total Average | 82 | 75 | 18 | 26 | Stable and evolving | Evolving and dynamic | Stable and evolving | Stable and evolving |

Looking at the product development projects and at the customers' needs, we realized that 75% of the product development projects were related to known and old customers' needs. This also indicated that there was not much radicalness in this variable of product development. However, it must be said that there was variation in the numbers. Again it can be related to the evolving or dynamics of the elements in "the field of product development". The data also gave some indication of which businesses were experiencing major changes of customers needs. Businesses like Lyngsø, B&O, and Grundfos experience considerable changes in customers needs and were also in an evolving and dynamic field of product development.

The above, however, indicated that the businesses deal with rather incremental product development projects and that the businesses know the characteristics of "the field of product development" very well. During the meetings the following comments supported this argument:

"Generally speaking, we only perform incremental product development – in 95% of the cases. Advanced models are only used in connection with large, radical product development assignments."
(Danfosss)

On the technical level the businesses claimed that 27% of their product development projects involved new technology – radical technology areas and 25% of their projects were carried out in known areas or in development areas in which small, incremental technology adjustments were necessary as seen in Table 10.11.

The businesses said that technology was the main actor increasing pressure on speed in product development. It was also verified that some of the businesses are more pushed by technological evolvement than others, and that some businesses which were not pushed by the market and customer element now are strongly pushed by the technology to speed PD further.

The case research also showed that 72% of the product development projects were related to market areas with fierce and rival competition as seen in Table 10.12

As pointed out by Richard Leifers (2002), it was very interesting to see that businesses developing in rather radical product development areas as e.g., Lyngsø, and Grundfos did not feel so hard and fierce a competition in some market areas. The focus group interviews also verified that businesses dealing with radical product development do not have such a high pressure on speed in product development.

Table 10.11 PD projects in relation to technology

| | Known Technology | | | Completely New Technology (Radical Technology) | Market | Technology | Network | Business Competences |
|---------------|------------------|---|---|--|----------------------|----------------------|----------------------|----------------------|
| | Known Technology | with Small Adjustments (Incremental Technology) | with Small Adjustments (Incremental Technology) | | | | | |
| Lyngsø | 40 | 30 | 30 | 30 | Evolving and dynamic | Dynamic | Evolving and Dynamic | Evolving and dynamic |
| Linco | 15 | 15 | 70 | 70 | Evolving | Evolving | Stable and evolving | Evolving |
| AKV | 80 | 15 | 5 | 5 | Stable | Stable | Stable | Stable |
| B&O | 50 | 20 | 30 | 30 | Evolving | Evolving and dynamic | Stable and Evolving | Evolving |
| DANFOSS | 70 | 20 | 10 | 10 | Stable and evolving | Evolving and dynamic | Stable and Evolving | Evolving |
| NEG MICON | 30 | 50 | 20 | 20 | Stable and evolving | Evolving and dynamic | Stable and Evolving | Evolving |
| Ansager | 80 | 15 | 5 | 5 | Stable | Stable | Stable | Stable |
| Scantio | 70 | 20 | 10 | 10 | Stable and evolving | Stable and evolving | Stable and evolving | Stable and evolving |
| GSI | 10 | 25 | 65 | 65 | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic |
| Grundfoss | 35 | 40 | 25 | 25 | Stable and evolving | Evolving and dynamic | Stable and Evolving | Stable and Evolving |
| Total Average | 48 | 25 | 27 | 27 | | | | |

Table 10.12 Product development projects in relation to competition

| | Markets with Low or No Competition | | Markets with Medium or Intensive Competition | | Markets with Fierce and Rival Competition | | Market | Technology | Network | Business Competences |
|---------------|------------------------------------|----|--|-----|---|-----|--------------|--------------|--------------|----------------------|
| | 30 | 20 | 50 | 50 | 50 | 100 | | | | |
| Lyngsø | 0 | 50 | 50 | 50 | 50 | 100 | Evolutionary | Dynamic | Evolutionary | Evolutionary |
| Linco | 0 | 50 | 50 | 50 | 50 | 100 | Evolutionary | Dynamic | Evolutionary | Evolutionary |
| AKV | 30 | 20 | 20 | 50 | 50 | 100 | Stable | Stable | Stable | Stable |
| B&O | 0 | 0 | 0 | 0 | 100 | 100 | Evolutionary | Evolutionary | Evolutionary | Evolutionary |
| DANFOSS | 0 | 0 | 0 | 0 | 100 | 100 | Stable | Evolutionary | Stable | Evolutionary |
| NEG MICON | 0 | 0 | 0 | 0 | 100 | 100 | Stable | Evolutionary | Stable | Evolutionary |
| Ansager | 0 | 60 | 60 | 40 | 40 | 40 | Stable | Stable | Stable | Stable |
| Scanio | 10 | 20 | 20 | 70 | 70 | 70 | Stable | Stable | Stable | Stable |
| GSI | 10 | 35 | 35 | 55 | 55 | 55 | Evolutionary | Evolutionary | Evolutionary | Evolutionary |
| Grundfoss | 0 | 0 | 0 | 100 | 100 | 100 | Stable | Evolutionary | Stable | Stable |
| Total Average | 8 | 21 | 21 | 72 | 72 | 72 | | | | |

Table 10.13 PD projects in relation to degree of innovation


| | No Degree of Innovation – Routine NPD Project | Medium Degree of Innovation – Modified Product Development with Minor Demands on Adjustment (Incremental) | High Degree of Innovation – Innovation with Many Elements of Innovation (Radical Innovation) | Market | Technology | Network | Business Competences |
|---------------|---|---|--|----------------------|----------------------|----------------------|----------------------|
| Lyngsø | 25 | 25 | 50 | Evolving and dynamic | Dynamic | Evolving and dynamic | Evolving and dynamic |
| Linco | 30 | 35 | 35 | Evolving | Evolving | Stable and evolving | Evolving |
| AKV | 25 | 25 | 50 | Stable | Stable | Stable | Stable |
| B&O | 30 | 40 | 30 | Evolving | Evolving and dynamic | Stable and evolving | Evolving |
| DANFOSS | 50 | 45 | 5 | Stable and evolving | Evolving and dynamic | Stable and evolving | Evolving |
| NEG MICON | 30 | 50 | 20 | Stable and evolving | dynamic | Evolving | Evolving |
| Ansager | 0 | 80 | 20 | Stable and evolving | dynamic | Stable and evolving | Stable |
| Scanto | 10 | 20 | 70 | Stable and evolving | Stable and evolving | Stable and evolving | Stable and evolving |
| GSI | 15 | 45 | 40 | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic | Evolving and dynamic |
| Grundfoss | 5 | 15 | 80 | Stable and evolving | Evolving and dynamic | Stable and evolving | Stable and evolving |
| Total Average | 22 | 38 | 40 | | | | |

The businesses considered 40% of their product development projects as having a high element of innovation – radical innovation. This designated therefore a rather radical element of the product development projects at the businesses. When dealing with innovative elements the businesses tended to focus primarily on internal elements – the businesses internal competences – and how the businesses’ competences matched the challenge on the tasks of product development put forward by the businesses as seen in Table 10.13.

10.4 The Task of PD – Radical or Incremental

From the comments given above the following picture of the businesses’ product development task related to radical and incremental product development could be drawn as shown in Table 10.14.

Table 10.14 PD task in relation to radical and incremental PD

| Dimension | Incremental | Radical |
|--|--|----------------|
| Where was the idea discovered | On the marketplace | |
| Initiator of idea | Customer | |
| Product type | Hardware 5% Software 95% | |
| Consequences for product core | | Modified core |
| Placement in product development stage | | Concept stage |
| Innovation degree | | Low |
| Market | | Old and mature |
| Customer needs | | Evolving |
| Customer group | Old | |
| Customer technology | Old | |
| Technology | | Old and stable |
| Network | | Old |
| Competence’s | Old and known | |
| Product management | The business | |
| Competition | High | |
| Strategic importance | High, important, short term and critical – survival | |
| Success criteria | Performance – high Cost – high Speed – very high CI – none CIM – some Learning – none | |
| Product development task |  | |
| PU model – formal | Stage gate | |
| Functions involved in initial phase | Sales and production | |
| Partners involved in initial phase | Business and customer | |

AKV and other similar businesses very seldom or only by coincidence worked with radical product development projects as their market, technology, network, and competences were very stable.

Ansager was mainly dealing with incremental physical product development because the market was not prepared to new developments on digital and virtual products nor were they prepared for development on immaterial products. Lyngsø worked with very radical PD projects but mainly on the technological and market specific area. Linco Trading worked mainly with incremental product development but often had to change incrementally products that were established a few years previously mainly because of a fast development on the markets of Linco's customers. NEG Micon, Grundfos and Danfoss perform mainly incremental product development on the technological side. However the demand on all markets was evolving e.g. for the windmills the market was turning to a demand for bigger windmills. NEG Micon were now facing a time for a radical product development on the mills as there was a physical limit to how large a gearbox they could build.

Scanio was mainly dealing with incremental product development on the meat machines whereas B&O was dealing with incremental and sometimes radical product development on the design (performance area). GSI Lumonics was dealing with radical product development on their laser welding machinery. These developments was heavily performed together with their customers.

General Product Development in Focus Group Businesses

The focus group research verified the existence of the following general characteristics of the sources to ideas to product development at the businesses.

The product development ideas came mainly from product development (31%), the sales function (21%), and from the customers (19%). Nevertheless, the variation from business to business was large as can be seen. However, the general picture indicated that the product development of the businesses was generally strongly based on identified needs and wants in the market and the businesses in general were strongly customer/sales oriented. However, there was a trend that an increasing number of ideas in the business were coming from network partners. In general, the businesses had a feeling that sources to new ideas in the future would come more from network partners and that businesses would join more NB PD projects as seen in Table 10.15.

It was verified very clearly that the area of attracting ideas was not particularly in focus of high speed in any of the businesses. The businesses liked to get new ideas but they were not focussing on speeding the processes.

10.5 Core of HS PD Project

The core of the product development projects was generally formulated in the strategic level inside the businesses. Most businesses formulated the core of the PD with an inside-out view. In general, the formulation of the core was made in this way because the businesses' ISO 9000 standard demanded such specification. 7 out of 10 businesses were ISO 9000 certified.

This was further supported by the fact that formal goals and limits (goals, costs, resources etc.) for the product development project were always specified. This is illustrated in Table 10.16.

Table 10.16 Goals and limits to product development

| Definition of Goals and Limits to PD Projects At the Beginning | In Percentage | | | Total |
|--|---------------|----|-------------|-------|
| | Yes | No | Do not Know | |
| Mission | 80 | 20 | 0 | 100 |
| Goals | 100 | 0 | 0 | 100 |
| Strategy | 60 | 10 | 30 | 100 |
| Economic Resources | 90 | 10 | 0 | 100 |
| Personnel/Organisational Resources | 70 | 20 | 10 | 100 |
| Contact Limits to Network Partners | 60 | 20 | 20 | 100 |

In most businesses the goals and limits for the product development projects in the businesses were defined in details in the following areas as can be seen in Table 10.16.

The businesses maintain that these specifications practically always helped the business to reach the success criteria for the product development project. Generally, the focus group businesses could be characterized as planning oriented businesses with a high focus on ISO 9000 standards. This meant high performance, high quality and stick to the rules of the ISO 9000 standards.

However, there were some differences in the above-mentioned from one business to another as can be seen in detail in Table 10.17.

As indicated in Table 10.17, the product development core was not always initially determined in some of the businesses.

10.6 HS PD Models

10.6.1 Formal Stages and Gates

In the focus group interview 6 businesses claimed that they had a formal stage gate model. These models were shown and discussed at the focus group interview meetings. The models can be seen in appendix. In addition, the focus group meetings could verify that many of the models were defined absolutely in accordance with the ISO 9001 standard. The stage and gates of the businesses formal product development model are shown in Table 10.18.

The case research showed that in general the businesses' formal product development models had three stages – a concept stage, a product development stage, and a process development stage. 40% of the businesses claimed that in general they had no formal idea stage but the initial phase of the product development process started with the concept stage.

In the screening area, the picture showed that the businesses had three gates – a concept screening gate, a prototype test gate, and a process test gate.

The above focus group interview results proved that the stage gate model existed at the businesses. Nevertheless, the results also proved that the stage gate model was slightly different from our research hypothesis model because the idea stages and gates did not formally exist in many of the businesses. Additionally, in many businesses (40%) there were no concept gates. The businesses go directly to prototyping. During the focus group meetings it was verified that many of the businesses did not use much time on the screening phases and these phases were under high speed pressure.

10.6.2 Informal Stage and Gate

The focus group interview showed that there was an informal model running parallel to the formal model in 60% of the focus group businesses. Some informal PD models were running all the time and in other businesses ad hoc when needed. The businesses confirmed the existence of such an informal product development model. The content existence of the informal product development model in different areas at the businesses are shown in Table 10.19.

It was very interesting to see that the businesses' informal product development model in nearly all businesses contains all stage and gates as defined in the research framework model. The idea stage and gate existed in most businesses only on an informal basis. The businesses claimed that the reason for this was that the idea stage and gate could not “live” in a strict ISO 9000

Table 10.18 Stages and gates of Lyngsø's formal PD model

| | Process | | | | | | | |
|-------------------|---------|---------|----------|-------------------|----------------|-------------------|------------|-----------------|
| | Idea | Concept | PD Phase | Development Phase | Idea Screening | Concept Screening | Proto Type | Process Testing |
| Lyngsø | N | Y | Y | Y | N | Y | Y | ISO 9001 |
| Linco | Y | Y | Y | Y | Y | Y | Y | ISO 9001 |
| AKV | N | Y | Y | Y | N | Y | Y | ISO 9001 |
| B&O | Y | Y | Y | Y | Y | Y | Y | ISO 9001 |
| DANFOSS | Y | Y | Y | Y | Y | Y | Y | ISO 9001 |
| NEG MICON | N | Y | Y | Y | N | N | Y | ISO 9001 |
| Ansager | N | N | N | N | N | N | N | ISO 9001 |
| Scanio | Y | N | Y | Y | N | N | Y | ISO 9001 |
| GSI | Y | Y | Y | Y | Y | Y | Y | ISO 9001 |
| Grundfoss | Y | Y | Y | Y | N | N | Y | ISO 9001 |
| Total Average Yes | 60 | 80 | 90 | 90 | 40 | 60 | 90 | 80 |
| Total Average No | 40 | 20 | 10 | 10 | 60 | 40 | 10 | 20 |

Table 10.19 Stages and gates of informal PD model of focus group businesses

| | Idea | | Process | | | Idea | | Concept | | Process | |
|---------------------------|------|-------------|----------|-------------|-----------|-----------|-----------|-----------|-------------|---------|--|
| | Y | N | PU Phase | Development | Screening | Screening | Screening | Prototype | Testing | | |
| Lyngsø | Y | Y | Y | Y | Y | Y | Y | Y | Y | | |
| Linco | N | Do not know | Y | Y | N | N | N | Y | Y | | |
| AKV | Y | Y | Y | Y | Y | Y | Y | Y | Y | | |
| B&O | N | N | N | N | N | N | N | N | N | | |
| DANFOSS | N | Y | Y | N | N | N | N | Y | N | | |
| NEG MICON | N | N | N | N | N | N | N | N | N | | |
| Ansager | Y | Y | Y | Y | N | Y | Y | Y | Do not know | | |
| Scanio | N | N | N | N | N | N | N | N | N | | |
| GSI | Y | Y | Y | Y | Y | Y | Y | Y | Y | | |
| Grundfoss | N | N | N | N | N | N | N | N | N | | |
| Total Average Yes | 40 | 50 | 60 | 50 | 30 | 40 | 40 | 60 | 40 | | |
| Total Average No | 60 | 40 | 40 | 50 | 70 | 60 | 60 | 40 | 50 | | |
| Total Average Do Not Know | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | | |

model with formal procedures etc. Furthermore, the businesses claimed that because of demands of ISO 9000 when they were ready for conceptualising the idea they had to “put” the idea into the formal stage-gate product development model.

Those businesses who had an informal product development model claimed that the informal product development model was important for all listed success criteria in the businesses. This state of affairs was illustrated in Table 10.20 below.

Table 10.20 Importance of informal PD model in relation to success criteria

| | Time | Costs | Performance | CIM | CI | Learning |
|-------------------|------|-------|-------------|-----|-----|----------|
| Lyngsø | Y | Y | Y | Y | Y | Y |
| Linco | Y | N | N | Y | Y | Y |
| AKV | Y | Y | TSE | TSE | N | TSE |
| B&O | N | N | N | N | N | N |
| Danfoss | TSE | TSE | N | TSE | TSE | TSE |
| NEG Micon | N | N | N | N | N | N |
| Ansager | Y | Y | TSE | N | TSE | TSE |
| Scanio | N | N | N | N | N | N |
| GSI | Y | Y | Y | TSE | Y | Y |
| Grundfos | N | N | N | N | N | N |
| Total Average Yes | 50 | 40 | 20 | 20 | 30 | 30 |
| Total Average TSE | 10 | 10 | 20 | 30 | 20 | 30 |
| Total Average No | 40 | 50 | 60 | 50 | 50 | 40 |

The informal product development models influenced in particular time. Also costs were influenced but not in particular performance. According to the businesses, the long term success criteria were not particularly influenced by the informal PD model.

The Informal Product Development Process

The focus group interviews verified that an informal product development process existed in many businesses and that it carries an impact on all success criteria of the businesses’ product development projects. The focus group interview showed more details on the running of informal processes at the idea and concept stage as well as on the influence on time and speed in the product development process.

Internal Functions Involved in Product Development Process

In the focus group interview the following functions showed to be involved at the different stages and gates of the product development process.

The businesses had a rather traditional involvement of functions at the product development stage and gates. Although it was verified that the business was very focused on the involvement of sales, management and the product development department at the initial idea and concept stage and gates.

Sales, marketing, product development, management and production were the main actors at the idea stage of the product development process. In large businesses the marketing functions were more involved at the initial stage and gates in PD. HRM and finance were hardly ever involved in the initial product development phase and in many businesses production only comes in occasionally in the initial phases of the product development stage. The businesses would see many of these functions on this early stage of the PD process. Neither finance or HRM were of relevance here as seen in Tables 10.21 and 10.22.

Table 10.21 Functions participating in PD idea stage

| Total | Idea Generation | Marketing | Finance | Sales | Management | Production | Product Development | HRM |
|-------|-----------------|-----------|---------|-------|------------|------------|---------------------|-----|
| | Y | 70 | 0 | 90 | 70 | 60 | 100 | 10 |
| | ISC | 20 | 40 | 10 | 20 | 20 | 0 | 0 |
| | N | 10 | 60 | 0 | 10 | 20 | 0 | 90 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Table 10.22 Functions participating in PD concept stage

| Total | Concept Generation | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|--------------------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 60 | 10 | 70 | 40 | 60 | 80 | 0 |
| | ISC | 10 | 20 | 30 | 50 | 10 | 20 | 0 |
| | N | 30 | 70 | 0 | 10 | 30 | 0 | 100 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Product development, sales, marketing, and production were the main actors at the concept stage of the product development process. Product development became more important at this stage and the management function diminishes its participation in the concept stage. HRM and finance were practically not involved at this stage.

Production and product development were the main actors at the product development (prototype stage) of the product development process as seen in Table 10.23. All other participating functions practically play a very small role at this stage. Management was more involved in PD in the small businesses.

Table 10.23 Functions participating in PD stage

| Total | Product Development | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|---------------------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 20 | 20 | 20 | 30 | 90 | 100 | 10 |
| | ISC | 40 | 0 | 40 | 50 | 10 | 0 | 0 |
| | N | 40 | 80 | 40 | 20 | 0 | 0 | 90 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

In the process development phase production and product development were the main actors. It was very interesting to see the product development functions participating so intensely at this stage. The focus group interviews did not give a clear picture of why the product development function was so involved in this stage as seen in Table 10.24.

Table 10.24 Functions participating in process development stage

| Total | Process Development | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|---------------------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 10 | 10 | 10 | 20 | 100 | 70 | 10 |
| | ISC | 10 | 20 | 10 | 40 | 0 | 30 | 0 |
| | N | 80 | 70 | 80 | 40 | 0 | 0 | 90 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

When looking at the gates of the product development models in the focus group businesses the hypothesis framework model could not be verified in several areas.

At the idea gate it was primarily the product development functions which were participating. In some cases sales, production, marketing and management were involved but the focus group meeting verified that this was mostly when the product development project had strategic importance or was to some extent radical considering the task of the product development project.

Many of the businesses did not have an idea screening gate or have a very minimised idea gate. As can be seen, the businesses focused more on the concept gate.

As seen in Tables 10.25 and 10.26 the product development function was mostly involved and other function are involved very much when there were some functions or areas that were of importance to the particular internal

Table 10.25 Functions participating in idea gate

| Total | Idea Gate | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|-----------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 50 | 30 | 60 | 50 | 60 | 90 | 0 |
| | ISC | 30 | 10 | 20 | 30 | 0 | 10 | 0 |
| | N | 20 | 60 | 20 | 20 | 40 | 0 | 100 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Table 10.26 Functions participating in concept gate

| Total | Concept Gate | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|--------------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 50 | 20 | 60 | 60 | 70 | 80 | 0 |
| | ISC | 30 | 0 | 20 | 30 | 10 | 20 | 0 |
| | N | 20 | 80 | 20 | 20 | 20 | 0 | 100 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

actor. Management also participate more when the strategic importance of the project was high.

The focus group interviews showed, however, that the concept gate was often passed through at high speed and as can be seen in the finance function was still not very involved. The focus group interviews verified that a new product development idea was able to “slip” very far into the product development process before it was met with strict gates to pass. The focus group interviews showed that this was very often due to a high pressure on time. Often, the result could be that businesses get stuck in a product development project and cannot “slip out” of the PD project again or only at great expense.

The prototype gate – Table 10.27 – was verified to be more important to the businesses but it was mainly the production and the product development functions which were involved.

Table 10.27 Functions participating in prototype gate

| Total | Prototype Test | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|----------------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 20 | 20 | 30 | 20 | 80 | 70 | 0 |
| | ISC | 10 | 20 | 30 | 50 | 20 | 30 | 0 |
| | N | 70 | 60 | 40 | 30 | 0 | 0 | 100 |
| | Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

At the process gate – Table 10.28 – it was mainly the production and product development function which were involved.

Table 10.28 Functions participating in process gate

| Total | Process Test | Marketing | Finance | Sales | Management | Production | Product Dev. | HRM |
|-------|--------------|-----------|---------|-------|------------|------------|--------------|-----|
| | Y | 30 | 30 | 20 | 20 | 90 | 60 | 0 |
| | ISC | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | N | 70 | 50 | 80 | 30 | 0 | 20 | 100 |
| | Total | 100 | 80 | 100 | 50 | 90 | 80 | 100 |

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Summing up on the stage and gates in the focus group businesses showed that the participation of functions in the product development model was very different from business to business but generally the picture looked as shown in Figure 10.3.

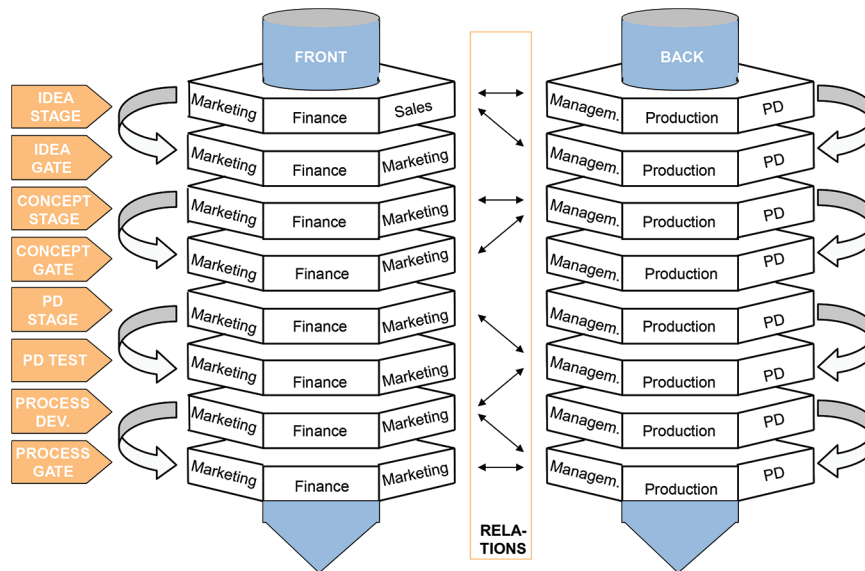


Figure 10.3 Participation of functions.

As can be seen HRM cannot be verified to be involved in the product development process and it could be verified that the financial function plays a very diminished role in the product development process.

PU Management and External Networks Involved in PD

To a large extent the product development projects at the businesses were managed by the customers (49%) with the businesses' product development department in the second place (24%). This gives a strong indication that the product development at the businesses was highly market oriented and based on a network consisting of the customers and business's sales department as indicated in Figure 10.3.

However, there were major differences in this picture depending on the characteristics of the field of product development. As can be seen businesses

such as B&O, Danfoss, and Lindholst have a strong internal management of their product development projects as seen in Table 10.29.

Table 10.29 Management of projects at focus group businesses

| Management of Project (%) | Lyngsø | Linco | AKV | B&O | Danfoss | Neg Micon | Ansager | Scanio | GSI | Grundfoss | Total |
|---------------------------|--------|-------|-----|-----|---------|-----------|---------|--------|-----|-----------|-------|
| Customer | 60 | 0 | 85 | 0 | 0 | 100 | 95 | 50 | 10 | 90 | 49 |
| Supplier | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 10 | 0 | 5 |
| Marketing | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 |
| Finance | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sales | 25 | 10 | 0 | 0 | 0 | 0 | 0 | 20 | 10 | 0 | 7 |
| Management | 0 | 0 | 0 | 0 | 65 | 0 | 0 | 0 | 10 | 0 | 8 |
| Production | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 3 |
| Product Development | 0 | 70 | 0 | 100 | 35 | 0 | 0 | | 30 | 0 | 24 |
| HRM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Competition | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Common Leadership | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 2 |
| Do not Know | 0 | 0 | 15 | 0 | 0 | 0 | 5 | 0 | 0 | 10 | 3 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

The nature of the network partners involved in the product development process can be seen in Table 10.30.

The customers were very involved at the beginning of the product development process in all businesses and at the end of the product development process when prototype tests were made. Surprisingly, the suppliers were not very involved in the product development process. They mainly joined the product development project at the process stage and process gate. The focus group interviews verified that the suppliers join the project at a very late point of time in the product development process.

The competitors were not involved in the business's product development process. The focus group interviews verified this very clearly. There was barely some networking going on around product development e.g. basic product development of new technology.

Other network partners were mainly involved in the upper part of the product development process mainly at the concept development and product development stage.

Table 10.30 Network partners involved in PD process

| | Customers | | | | Suppliers | | | | Competition | | | | Other Network | | | | | | | | |
|--------------|-----------|----|-----|----|-----------|----|-----|----|-------------|-----|-----|----|---------------|----|-----|----|----|---|----|-----|--|
| | Y | N | ISC | DN | Y | N | ISC | DN | Y | N | ISC | DN | Y | N | ISC | DN | Y | | | | |
| Idea | 90 | 10 | 0 | 0 | 100 | 50 | 50 | 0 | 0 | 100 | 10 | 90 | 0 | 0 | 100 | 20 | 60 | 0 | 20 | 100 | |
| Generation | | | | | | | | | | | | | | | | | | | | | |
| Concept | 100 | 0 | 0 | 0 | 100 | 30 | 70 | 0 | 0 | 100 | 10 | 90 | 0 | 0 | 100 | 60 | 30 | 0 | 10 | 100 | |
| Generation | | | | | | | | | | | | | | | | | | | | | |
| Product | 60 | 40 | 0 | 0 | 100 | 60 | 40 | 0 | 0 | 100 | 10 | 90 | 0 | 0 | 100 | 50 | 40 | 0 | 10 | 100 | |
| Development | | | | | | | | | | | | | | | | | | | | | |
| Process | 10 | 80 | 0 | 10 | 100 | 60 | 40 | 0 | 0 | 100 | 10 | 90 | 0 | 0 | 100 | 20 | 60 | 0 | 20 | 100 | |
| Development | | | | | | | | | | | | | | | | | | | | | |
| Phase | | | | | | | | | | | | | | | | | | | | | |
| Idea | 50 | 10 | 0 | 40 | 100 | 20 | 60 | 0 | 20 | 100 | 0 | 90 | 0 | 10 | 100 | 10 | 40 | 0 | 50 | 100 | |
| Screening | | | | | | | | | | | | | | | | | | | | | |
| Concept | 40 | 30 | 0 | 30 | 100 | 20 | 60 | 0 | 20 | 100 | 10 | 90 | 0 | 0 | 100 | 20 | 30 | 0 | 50 | 100 | |
| Screening | | | | | | | | | | | | | | | | | | | | | |
| Proto Type | 90 | 10 | 0 | 0 | 100 | 40 | 60 | 0 | 0 | 100 | 0 | 90 | 0 | 10 | 100 | 20 | 60 | 0 | 20 | 100 | |
| Test | | | | | | | | | | | | | | | | | | | | | |
| Process Test | 40 | 40 | 0 | 20 | 100 | 70 | 30 | 0 | 0 | 100 | 0 | 90 | 0 | 10 | 100 | 30 | 50 | 0 | 20 | 100 | |

Y = Yes
 N = No
 ISC = In some cases
 DN = Do not know

Summing up on the network activities in product development at the focus group businesses:

Table 10.31 HS enablers used in focus group businesses

| HS Enablers | Total | | | | Total |
|------------------------------|-------|-----|----|----|-------|
| | Y | ISC | N | DN | |
| 1 ICT Communication Enabler | 50 | 40 | 10 | 0 | 100 |
| 2 Customer Enabler | 80 | 20 | 0 | 0 | 100 |
| 3 PD Model Enabler | 30 | 60 | 10 | 0 | 100 |
| 4 Network Enabler | 50 | 40 | 0 | 10 | 100 |
| 5 Innovation Enabler | 50 | 40 | 0 | 10 | 100 |
| 6 HRM Enabler | 30 | 50 | 20 | 0 | 100 |
| 7 Process Enabler | 20 | 70 | 10 | 0 | 100 |
| 8 Product to Process Enabler | 70 | 20 | 0 | 10 | 100 |
| 9 Modularisation Enabler | 70 | 20 | 0 | 10 | 100 |
| 10 Development Enabler | 20 | 40 | 20 | 20 | 100 |

It was verified that all enablers are in use – Table 10.31 – but the HRM enabler and the e-development enabler were not so much in use. The focus group interview, however, verified that the businesses’ use of the enablers was very much on an ad hoc basis and seldom related to the task of product development to be solved or to the characteristics of the “field of product development”.

It was also verified that many of the businesses focus on one or two of the enablers, e.g. the modularisation enabler, and use this enabler in all high speed approaches.

Summarising on the enablers to high speed product development it could be verified that there was a use of all HS enablers but the potential of the individual HS enablers seemed not to be use in full scale.

10.7 Success Criteria of HS PD

The focus on success criteria in NB HS NPD were treated by the researchers in a two step way. Firstly, the businesses were introduced to the short term success criteria via Balachandra’s theoretical framework. Secondly, the long term success criteria were presented.

The short term success criteria were presented in the course of 3 meetings. Firstly, the time and speed aspect then the cost and finally the performance aspect.

The research verified that the businesses were very focused on short-term success criteria – in particular performance and time as seen in Table 10.32.

Table 10.32 Priorities of success criteria at Lyngsø

| Success Criteria | Total | | | | | Total |
|------------------|-------|----|----|----|---|-------|
| | 1 | 2 | 3 | 4 | 5 | |
| Time | 30 | 70 | 0 | 0 | 0 | 100 |
| Cost | 30 | 20 | 50 | 0 | 0 | 100 |
| Performance | 90 | 10 | 0 | 0 | 0 | 100 |
| CIM | 20 | 50 | 30 | 0 | 0 | 100 |
| CI | 50 | 20 | 10 | 20 | 0 | 100 |
| L | 20 | 40 | 30 | 10 | 0 | 100 |

The businesses had minor focus on long term success criteria and most focus in a long term perspective was on continuous innovation.

The reason why the businesses did not generally focus on time might be that the businesses are characterised by high quality products. Secondly, as we had stated before businesses operating in radical product development areas did not have a high focus on speed and time. Nevertheless, the focus group interview verified that the priorities of success criteria changed from one business to another as can be seen in Table 10.33.

Table 10.33 General priorities of success criteria at focus group SMEs

| Priorities | Lyngsø | Linco | AKV | B&O | Danfoss | Neg Micon | Ansager | Scanio | GSI | Grundfoss |
|-------------|--------|-------|-----|-----|---------|-----------|---------|--------|-----|-----------|
| Time | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 |
| Cost | 2 | 2 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 3 |
| Performance | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| CIM | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 3 | 3 |
| CI | 1 | 1 | 4 | 1 | 1 | 3 | 2 | 2 | 1 | 4 |
| L | 2 | 2 | 4 | 3 | 1 | 3 | 3 | 2 | 1 | 2 |

Furthermore, the research verified that the prioritising of success criteria changed during the product development stage- and gates.

As can be seen, time was the most considered success criteria to the product development of the businesses. When the product development project reached the concepts screening and proto type test, performance becomes most in focus.

The case businesses were very different in their way of prioritising the success criteria of a product development project. Related to the characteristics on the field of product development and the radicalness of the task of product development, a different prioritising could be verified as seen in Table 10.34.

Table 10.34 Specific priorities of success criterias at focus group SMEs

| | Idea | Concept | PD Stage | Process Stage | PD Test | Idea Screening | Concept Screening | Proto Type Test | Process Test |
|-------------|------|---------|----------|---------------|---------|----------------|-------------------|-----------------|--------------|
| Time | 30 | 30 | 50 | 30 | 30 | 30 | 0 | 10 | 40 |
| Costs | 0 | 10 | 20 | 30 | 20 | 30 | 20 | 20 | 20 |
| Performance | 20 | 20 | 20 | 20 | 10 | 0 | 60 | 50 | 0 |
| CIM | 20 | 10 | 0 | 10 | 0 | 10 | 0 | 0 | 0 |
| CI | 20 | 20 | 0 | 0 | 20 | 10 | 0 | 0 | 10 |
| Learning | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 |
| NA Total | 10 | 10 | 10 | 10 | 20 | 20 | 10 | 10 | 30 |
| | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

10.8 Time, Speed and Cost of HS PD

The focus group businesses showed to focus very much on speed and time at the product development stage, at all initial screening gates and finally at the implementation stage. Some of the businesses verified that they used the speed factor as a tool to get more product development work out of the organisation. One business even verified that a diminishing of the pressure on speed in product development would diminish the work significantly in the product development department.

The focus group interview showed that the businesses work very differently with speed in product development. Some businesses worked actively with speed in product development when others only work with speed when they were forced to do so.

The cost of HS PD was not calculated in the businesses involved. Only some businesses had a overall calculation on the cost of HS PH.

10.9 Performance and HS PD

Performance was very much in focus at the last gates of the product development process. The businesses put a high priority on CIM at the idea stage and on CI at the concept stage. This meant that the pressure on time was reduced because the businesses focus on maximal innovation and continuous improvement at the initial stages.

10.10 Reflection on Results of Focus Group Interview

In the following Table 10.35 it was possible to see which hypo these had been verified in the focus group interview.

Table 10.35 Verification table of Chapter 10

| Chapter 10 Empirical Results – Focus Group Interviews | | |
|---|---|-----------------------|
| Overall Research Questions to be Verified | Hypotheses to be Verified and Tested | Verified/not verified |
| 1. What is network based high speed NPD | HS NPD can be seen from different views (Macro environment, business, product, market, customer, technology, competitive and network view) | Verified |
| HS NPD is a matter of right speed and not high speed. | Verified | |
| 2. What enablers to NB HS PD can be identified? | Businesses use different HS enablers. | Verified |
| | HS enablers are identical to the 10 enablers – 1–10 | Partly verified |
| | There can be more than these 10 enablers to HS PD | Verified |
| | The enablers will play a different role according to the PD situation and project (Secondary focus) | Verified |
| | The customer enabler, the network enabler and the PD model enabler plays an important role in the upper phase of the HS PD phase. | Partly verified |
| 3. What framework models and processes in the idea and concept stage/gate of high speed product development based on networks can be measured | The HS PD projects can be divided into to radical and incremental PD projects | Verified |
| | The radical and the incremental PD projects follow different generic HS PD models and processes and can thereby be described by different generic frameworks | Partly verified |
| 4. What success criteria can be used for measuring high speed product development based on networks? | The success criteria for HS PD are dependent on the specific PD project – radical or incremental | Verified |
| | HS PD success criteria can be formulated as short term and long term success criteria | Verified |
| | Time, cost and performance are central success criteria in a short term perspective | Verified |
| | Continuous improvement (CIM), continuous innovation (CI), and learning are central success criteria in a long term perspective to reach right time, right cost and right performance in NB HS PD. | Partly verified |

