

11

Empirical Results – Survey

11.1 Introduction

The analysis was made on data captured during a study of high speed product development practices in small and medium sized businesses in 2002. The unit of the analysis used in this study was the product development project and the respondent was the person responsible for the SMEs' product development activities.

A questionnaire was developed on behalf of the case and focus group research and collected data through an Internet based survey of 156 Danish, German, Czech, and Italian small and medium sized businesses in 2002. This was done to verify the observations in the case, focus group and other research activities to improve reliability and validity in the research project and to try to reach a triangulation in the research project.

The German, Czech, and British businesses only amounted to 12 businesses.

The survey was presented to 456 businesses via the Internet. Unfortunately, some of the e-mail addresses were not correct or did not exist any longer. This reduced the survey to 379 potential respondents. Approximately 87 businesses did not want to answer due to different reasons, and this left the survey with the following results:

As can be seen in Table 11.1, the response rate (53.5%) was satisfactory compared to the number of businesses who could and would answer the questionnaire sent via the Internet.

The aim of this chapter is:

- to verify, test, and give answers to the research hypotheses and questions set up earlier in Chapter 1.
- to show and verify NB HS NPD models and processes carried out in SMEs.
- to verify different SME businesses' solutions to NB HS NPD.

Table 11.1 Survey response statistics

Survey Response Statistics	No.	Danish	Foreign	Total	%
Original respondent	456	444	12	456	100
E-mail address error	77	77	12	89	19.5
Potential respondent	379	367	12	379	80.5
Did not want to answer out of total	87	87	0	87	19.1
Did not want to answer out of potential	87	87	0	87	23.0
Potential respondents who wanted to answer	292	280	12	292	77.0
Answered out of total	156	144	12	156	34.2
Answered out of potential	156	144	12	156	53.4

- to determine whether there were differences or extras that have not been observed in both case and focus group interviews.
- to reflect on the consequences which high speed and right speed have on different parameters as shown in Table 11.2.

Table 11.2 Consequences of speed on different parameters

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

Table 11.3 presents the contribution of the survey to the research questions.

Table 11.3 Hypotheses to be verified in Chapter 11

Empirical Results – Survey		
Overall Research Questions to be Verified	Hypotheses to be Verified and Tested	Survey
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).	X
	HS NPD is a matter of right speed and not high speed.	X
2. What enablers to HS PD can be identified?	Businesses use different HS enablers.	X
	HS enablers are identical to the 10 enablers – 1–10	X
	There can be more than these 10 enablers to HS PD.	X
	The enablers will play a different role according to the PD situation and project (Secondary focus).	X

Table 11.3 Continued

	The customer enabler, the network enabler and the PD model enabler plays an important role in the upper phase of the HS PD phase.	X
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.	X
	The radical and the incremental PD projects follow different generic HS PD models and processes and can thereby be described by different generic frameworks.	X
4. What success criteria can be used for measuring measuring high speed product development based on networks?	The success criteria for HS PD are dependent on the specific PD project – radical or incremental.	X
	HS PD success criteria can be formulated as short term and long term success criteria.	X
	Time, cost and performance are central success criteria in a short term perspective.	X
	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.	X

11.2 General Conditions and Trends in PD

The survey businesses' product portfolio is strongly focused on physical and service products as seen in Table 11.4. However, on the new product introduction a stronger focus on physical products were seen. The development on service products was diminishing radically.

Table 11.4 Focus on product types

	Physical Products	Service Products	Knowledge and Consultancy
Existing Product Portfolio	81	11	8
New Products	88	4	8

The businesses' products seen in another dimension – Table 11.5 – showed that 93% of the products were physical products, 4% were digital products, and only 3% were virtual products. This meant that hardly any of the businesses had yet gone into offering virtual products to the market.

The business had 92% on physical processes and 5% on digital processes as seen in Table 11.5. The survey showed very clearly that the businesses did not think of the product as a process. The product to process thinking and high speed enabler was not yet introduced in the businesses. The businesses still

Table 11.5 Focus on products and processes

	Physical Products	Digital Products	Virtual Products
Existing Product Portfolio	93	4	3
	Physical Processes	Digital Processes	Virtual Processes
Existing Product Portfolio	92	5	3

think of the products as physically “encapsulated” products with a beginning and an end – products with the classical lifecycles.

The survey businesses were asked to give general comments on their view of the conditions in “the field of product development”. These comments are collected in below. Below the Table 11.6 central comments are presented in details.

Table 11.6 General conditions on the field of PD according to the survey

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 market were under pressure from 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 were mainly based on physical and stable networks; often internal and dominated network.
Dynamic technologies	
Network	
Stable networks	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.
Evolving networks	
Dynamic network	
Business competence context	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 enter and leave. None of the businesses had joined a network without a formal network leader.
	Businesses felt that there was a high pressure on support competences and that they had to develop complementary competences either by internal development or by external recruiting in their networks. A high pressure on businesses core competences were realised and some of the businesses felt their competitive advantage on core competences were reduced or diminished by competitors.

11.2.1 General PD at Survey Businesses

The survey research verified that the sources to ideas to product development at the businesses were as seen in Table 11.7:

Table 11.7 Sources of PD ideas in general

Sources to Product Development Ideas in General	Total
Customers	22
Suppliers	3
Marketing	4
Finance	0
Sales	16
Leadership/Management	8
Production	9
Product Development	26
Human Resources	0
Competition	7
Others	4
Do not know	3
Total	100

The product development ideas came mainly from product development (26%), the customers (22%), and from the sales function (16%). Nevertheless, the variation from business to business was huge as can be seen. However, the general picture indicates that the product development of the businesses was generally strongly based on identified needs and wants in the market. The businesses in the survey seem in general to be strongly customer/sales oriented.

It was verified very clearly that the area of attracting ideas was not in particular focus of high speed in the businesses. This will be explained at a later point in this book. The businesses were not focussing on speeding processes or of attracting new ideas.

11.3 Product Development Task

On the basis of the survey, the task of product development of the businesses could be verified as follows:

The businesses' new product generation – as seen in Table 11.8 – could be related to an increase in hardware or physical products from 81% to 88%, whereas service and knowledge products had decreased from 11% to 4%. The businesses' product portfolios mainly consisted of physical products (81%)

Table 11.8 PD Tasks of survey businesses

	Physical Products	Service Products	Knowledge and Consultancy
Existing Product Portfolio	81	11	8
New Products Product Development	88	4	8

and service products today (11%). This was expected also to be the case in the near future. However, the introduction of new products and the product development efforts were now changing and the businesses were focusing more on knowledge and consultancy products as indicated in Figure 11.1.

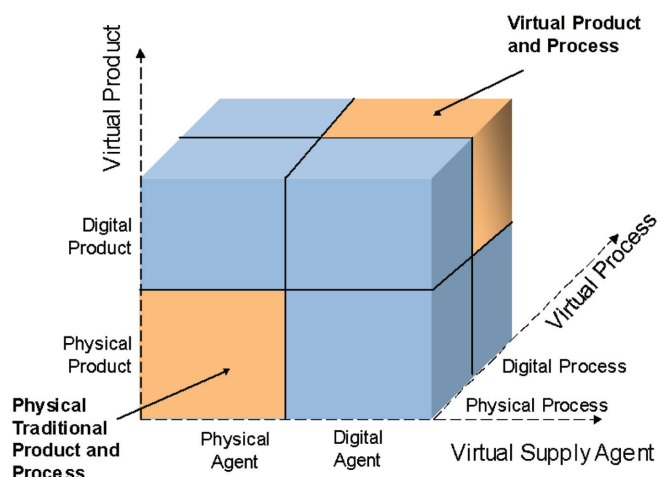


Figure 11.1 Turban's three dimensions.

The businesses also claimed as seen in Table 11.9 that in general product development projects could be divided into 81% strategic known and old areas and 19% unknown and new areas.

Table 11.9 PD projects in relation to strategic areas

	Strategic Areas		Total
	Known and Old Areas	Unknown and New Areas	
Total	81	19	100
Std. Div.	14.5	14.4	
Min	40	0	
Max	100	60	

Still there were major variations in the businesses' product development activities as can be seen in the standard deviation. It could be verified that the focus in PD was very much related to the characteristics of the specific elements in "the field of product development". When looking at the businesses' industry data and background 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 centre their product development more on unknown and new strategic areas and a to 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.

The businesses' product development projects mainly concerned development of new products (51.7%). It was interesting to note that 24.4% of the businesses' new products need major adjustments after 1 year as seen in Table 11.10.

Table 11.10 PD in relation to product

	Old Products More than 3 Years with a Need for Small Adjustments	Old Products More than 3 Years with a Need for Major Adjustments	New Products Older than 1 Years with a Need for Small Adjustments	New Products Older than 1 Years with a Need for Major Adjustments	
Total in %	21.1	27.1	27.3	24.4	100
S Dev.	17.4	24.2	25.5	23.6	
Min	0	0	0	0	
Max	60	100	100	80	

The survey also showed that 51.1% of the businesses' existing product portfolios needed huge adjustments. This indicated a high pressure on product development and a diminishing product life cycle.

The survey research showed that there were many differences in the pressure on product development from one business to another and that the characteristics in the field of PD influenced this pressure on product development to a very large extent.

The survey also showed that 82% of the product development in the business was on known and old customer groups as seen in Table 11.11.

Table 11.11 PD in relation to customer groups and needs

	Known and Old Customer Groups	Unknown and New Customer Groups	Known and Old Customer Needs	Unknown and New Customer Needs
Total	82	18	74	26
S Dev.	14.7	14.6	19.6	19.3
Min	30	0	30	0
Max	100	70	100	70

This verifies incrementalness for which customers were going to buy the businesses product development in the future.

Looking at the product development projects and at the customers' needs, we realized that 74% of the product development projects were related to known and old customers' needs. This also indicates that there was not much radicalness in this variable of product development. However, it must be said that there was variation in the numbers. Yet again it could be related to how evolving or dynamic the elements on "the field of product development" were.

The above verifies that the businesses dealt with incremental product development projects on this dimension and that the businesses knew very well which characteristics "the field of product development" had.

On the technical level – Table 11.12 – the businesses claimed that 14% of their product development projects involved new technology – radical technology areas and 86% of their PD projects were carried out in known areas or in development areas in which small, incremental technology adjustments were necessary.

Table 11.12 PD projects in relation to technology

	Known Technology	Known Technology with Small Adjustments (Incremental Technology)	Completely New Technology (Radical Technology)	Total
Total	61	25	14	100
S Dev.	22.1	17.0	14.6	
Min	15	0	0	
Max	100	95	70	

The survey businesses seemed not to be pushed so much by the technology as earlier maintained in the case and focus group interviews. As can be seen by the statistical data it was verified that there were major variations in the data. Furthermore, some of the businesses were more pushed by technological evolution. Some businesses which were not pushed by the market and customer elements were now strongly pushed by technology.

The survey research also showed that 54% of the product development projects were related to market areas with fierce and rival competition as seen in Table 11.13.

Table 11.13 PD projects in relation to competition

	Markets with Low or No Competition	Markets with Medium or Intensive Competition	Markets with Fierce and Rival Competition	Total
Total	9	37	54	100
S Dev.	18.2	31.4	35.6	
Min	0	0	0	
Max	70	100	100	

The businesses considered 28% of their product development projects as having a high element of innovation as seen in Table 11.14. This designated a not so high radical element of the product development projects as previously seen in the case and focus group interview.

Table 11.14 PD projects in relation to degree of innovation


	No Degree of Innovation – Routine NPD Project	Medium Degree of Innovation – Modified PD with Minor Demandson Adjustments (Incremental)	High Degree of Innovation – with Many Elements of Innovation (Radical Innovation)	Total
Total	36	36	28	100
S Dev.	25.7	18.4	26.6	
Min	0	0	0	
Max	100	80	100	

However, the innovative element focused on the businesses’ internal competences – and how the businesses’ competences matched the challenge on the tasks of product development – gave a picture of a future high challenge and pressure on this dimension.

11.4 Task of PD – Radical or Incremental

From the above-given comments the following picture of the businesses’ product development task related to radical and incremental product development could be drawn as seen in Table 11.15.

Table 11.15 Incremental and radical product development in SMEs

Dimension	Incremental	Radical
Where was the idea discovered	Known – On the market place	
Initiator of idea	Known – By customers, sales and product development department.	
Product type	Known – Hardware 83% Service 8.5%. Knowledge and consultancy 8.5%	
Process type	Known – Physical processes 83% Digital processes 16% virtual processes 1%.	
Strategic areas	Known and old areas (81%) unknown and new areas (19%).	
Innovation degree	Low	
Market	Old and well known markets	
Customer group	Old and well known (82%) unknown (18%).	
Customer needs	Known and Old Customer Needs Slightly (74%) Unknown and new customers needs (26%) slightly evolving.	
Technology		Known Technology (61%) – Known Technology with Small Adjustments (Incremental Technology (25%) – Completely New Technology (Radical Technology) (14%) evolving.
Competition		Markets with Low or No Competition (9%) – Markets with Medium or Intensive Competition (37%) – Markets with Fierce and Rival Competition (54%).
Network	Old and narrow	
Innovation-challenge and press on businesses competence		No Degree of Innovation – Routine NPD Project (36%) – Medium Degree of Innovation – Modified Product Development with Minor Demands on Adjustment (Incremental) (36%) – High Degree of Innovation – with Many Elements of Innovation (Radical Innovation) (28%).
Product development task		

As can be verified, the product development task was rather well defined, and the pressure on product development comes mainly from the technology and the challenge to the competences of the businesses as indicated in Figure 11.2. The high pressure from competition could not be verified to be related to radical development on customers' needs and wants.

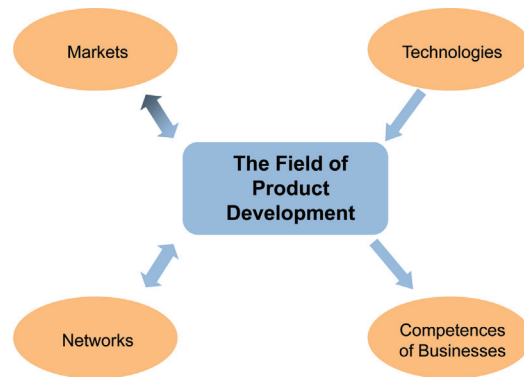


Figure 11.2 Field of product development.

Consequently, the picture of the field of product development could be illustrated according to the results of the survey.

11.5 Core of HS PD Project

The core of the product development projects was generally formulated at the strategic level inside the businesses. Most businesses formulated the core of the PD with an inside-out view.

This was further supported by the fact that formal goals and limits (goals, cost, resources etc.) for the product development project were always specified. This is illustrated in Table 11.16.

Table 11.16 Goals and limits to product development

Definition of Goals and Limits to Product Development Project	Yes	No	Do Not Know	Total
Mission	63	31	6	100
Goals	94	6	0	100
Strategy	50	38	13	100
Economic Resources	94	6	0	100
Personnel/Organisational Resources	75	25	0	100
Contact Limits to Network Partners	59	38	3	100

The goals and limits for the product development projects in the businesses were in most businesses defined in details in the areas as shown in Table 11.16.

The mission and contact limits to network partners were seldom formulated. The strategy was often formulated later in the product development project.

The businesses maintained that the specifications helped the businesses to reach the success criteria for the product development project. Generally, by the empirical data the businesses could be characterized as very planning oriented businesses.

However, there were some differences in the above -mentioned statements from one business to another. This will be explained in detail in the following paragraph.

11.6 HS PD Models

11.6.1 Formal Stages and Gates

The businesses in the survey claimed that in general they had a formal stage gate model. The stage and gates of the businesses' formal product development model are shown in Table 11.17.

Table 11.17 Stages and gates of the survey businesses' formal PD model

	Idea	Concept	PD Phase	Process Development Phase	Idea Screening	Concept Screening	Prototype Test	Process Testing
Yes	88	92	96	88	57	57	87	77
No	12	8	4	8	35	30	4	23
Under constructions	0	0	0	4	9	13	9	0
Total	100	100	100	100	100	100	100	100

The survey showed that generally the businesses' formal product development model had four stages – an idea stage, a concept stage, a product development stage, and a process development stage. A quite different result from that produced by the case and focus group interviews.

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

However, there were uncertainties when it came to the idea and concept screening gates as quite many businesses claimed that they did not have such gates. The existence of prototype and process gate was extensively confirmed by the businesses.

The above survey 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 and concept gates did not formally exist in many of the businesses. It seemed as if many businesses had put tremendous efforts into and importance on the prototype stage and gate.

Thus, the formal product development model could be verified as existent in the SMEs.

11.6.2 Informal Stages and Gates

The survey research also 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 business 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 seen in Table 11.18.

Table 11.18 Stages and gates of focus group businesses informal PD model

Informal Models	Idea	Concept	PD Phase	Process Development Phase	Idea Screening	Concept Screening	Prototype Test	Process Testing
Yes	71	62	86	52	35	30	80	50
No	29	29	14	38	55	60	20	45
Under Constructions	0	10	0	10	10	10	0	5
Total	100	100	100	100	100	100	100	100

It is very interesting to see that the businesses' informal product development model in nearly all businesses contained all stage and gates as defined in the research framework model. The existence of informal idea stage and PD stage was very significant in most businesses. Informal gates were not so much in use in the businesses except in the prototype gate. The survey could not explain the reason for this.

The 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 but particularly the time criteria. This state of affairs is illustrated in Table 11.19.

Table 11.19 Importance of informal PD model in relation to success criteria

	Time	Costs	Performance	CIM	CI	Learning
Yes	48	29	24	33	24	30
No	10	14	19	19	14	25
ISC	43	48	43	38	43	30
Do not know	0	10	14	10	19	15
	100	100	100	100	100	100

Also cost was influenced but not in particular performance. The long-term success criteria were not particularly influenced by the informal PD model except CIM.

11.6.3 The Informal PD Process

The survey verified that an informal product development process existed in many businesses and that it carried an impact on all success criteria of the businesses' product development projects.

11.6.4 Internal Functions Involved in PD Process

In the survey 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. Nevertheless, it seemed as if 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 as seen in Table 11.20.

Product development, sales, management, production and marketing were the main actors at the idea stage of the product development process. HRM and finance were practically not involved in the initial product development phase.

Product development, marketing, management, sales, and production were the main actors at the concept stage of the product development process as seen in Table 11.21. Product development are still most important at this stage and the management and sales function diminish their participation in the concept stage. The marketing function increased its involvement. HRM and finance were still hardly involved in this stage.

Table 11.20 Functions participating in PD idea stage

Total	Idea Generation	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	38	8	65	54	43	95	0
	ISC	27	73	0	8	11	3	92
	N	32	19	35	35	43	3	3
	DN	3	0	0	3	3	0	5
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Table 11.21 Functions participating in PD concept stage

Total	Concept Generation	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	49	9	43	44	43	83	0
	ISC	23	77	6	15	23	3	91
	N	26	11	51	41	34	14	3
	DN	3	3	0	0	0	0	6
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Product development and production were the main actors at the product development (prototype stage) of the product development process as seen in Table 11.22. All other participating functions were practically not involved at this stage.

Management was more involved in the PD stage than other functions such as marketing and sales. Finance and HRM were still not very involved.

In the process development phase production and product development were the main actors as seen in Table 11.23. It was very interesting to see the product development function's considerable participation at this stage. The survey did not give a clear answer to the question why the product development function was so involved at this stage.

Table 11.22 Functions participating in PD product development stage

Total	Product Development	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	22	14	30	35	68	95	3
	ISC	30	5	32	43	24	3	0
	N	46	78	32	19	5	3	92
	DN	3	3	5	3	3	0	5
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Table 11.23 Functions participating in process development stage

Total	Process Development	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	11	11	9	31	75	69	3
	ISC	17	19	31	36	22	22	0
	N	69	64	57	31	3	6	94
	DN	3	6	3	3	0	3	3
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

When looking into the gates of the product development models in the focus group businesses, several areas did not succeed in verifying the hypothesis framework model.

At the idea gate as seen in Table 11.24 it was primarily the product development function which was participating. In some cases management, sales, production, and marketing were involved but the survey verified that this was mostly when the product development project had strategic importance or was rather radical considering the task of the product development project.

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

Table 11.24 Functions participating in idea gate

Total	Idea Gate	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	25	9	41	45	38	75	0
	ISC	47	6	41	32	25	16	0
	N	25	81	16	16	34	9	97
	DN	3	3	3	6	3	0	3
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

The product development function was the function most involved. Other function were very involved when there were functions or areas that were of importance to the particular internal actor. Management also participate more when the strategic importance of the project was great.

The survey showed, however, that the concept gate was often passed through at high speed, and as can be seen in Table 11.25 the finance function was still not involved. The survey also verified that a new product development idea was in danger of “slipping” very far into the product development process before it encounters strict gates to pass.

Table 11.25 Functions participating in concept gate

Total	Concept Gate	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	45	13	33	40	38	73	0
	ISC	31	0	50	43	21	17	0
	N	21	83	13	10	41	10	97
	DN	3	3	3	7	0	0	5
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

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

In the process gate it was still mainly the production and product development functions which were involved.

The rest of the functions were not particularly involved.

Summing up on the stages and gates in the survey we understand that the participation of functions in the product development model was very different from one business to another.

As can be seen, the HRM function cannot be verified to be involved in the product development process as seen in Tables 11.26 and 11.27. It can also be

Table 11.26 Functions participating in prototype gate

Total	Prototype Test	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	14	5	65	27	70	86	0
	ISC	17	5	35	43	22	11	3
	N	61	81	35	30	8	3	89
	DN	8	8	3	0	0	0	8
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

Table 11.27 Functions participating in process gate

Total	Process Test	Marketing	Finance	Sales	Management	Production	Product Dev.	HRM
	Y	45	13	33	40	38	73	0
	ISC	31	0	50	43	21	17	0
	N	21	83	13	10	41	10	97
	DN	3	3	3	7	0	0	3
	Total	100	100	100	100	100	100	100

Y = Yes

N = No

ISC = In some cases

DN = Do not know

verified that the financial function played a very diminished role in the product development process. This was quite surprising.

PU Management and External Networks Involved in PD

To a large extent the product development projects at the businesses were managed by the customers (56%) with the management of the businesses in second place (12%) as seen in Table 11.28. This gave a strong indication that the product development at the businesses was highly market-oriented at the time of the research was carried out.

Table 11.28 Management of projects in survey businesses

	Management of Project (%)			
	Total	Std. Div.	Min	Max
Customer	56	44	0	100
Supplier	12	28	0	75
Marketing	7	29	0	80
Finance	1	14	0	45
Sales	0	3	0	10
Management	12	41	0	100
Production	1	6	0	15
Product Development	9	36	0	100
HRM	0	0	0	0
Competition	0	0	0	0
Common Leadership	2	19	0	60
Do no know	0	0	0	0
Total	100			

However, there were major differences in this scenario. This is mainly related to the characteristics of the field of product development.

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

In all businesses the customers are very involved at the beginning of the product development process and at the end of the product development process when prototype tests are made. The supplier comes in at a later point of time in the product development process. Usually, they come in for the product development, the process stage, and the process gate. The focus group interviews verified that the suppliers come in very late in the product development process.

The competitors are not involved in the businesses' product development process although the survey verified that the competitors are more involved than verified by the case and focus group interview.

Other network partners as seen in Table 11.29 showed to be much more involved in the survey research than in the other research. However, they are mainly involved in the upper part of the product development process mainly the idea, concept, and product development stage.

Table 11.29 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				
Idea Generation	75	25	0	0	100	28	72	0	0	100	8	81	0	11	100	39	47	0	14	100
Concept Generation	67	31	0	3	100	24	73	0	3	100	6	83	0	11	100	39	50	0	11	100
Product Development	56	44	0	0	100	73	27	0	0	100	6	83	0	11	100	43	43	0	14	100
Process Development Phase	19	75	0	6	100	53	47	0	0	100	6	83	0	11	100	25	61	0	14	100
Idea Screening	72	28	0	0	100	44	56	0	0	100	6	83	0	11	100	22	58	0	19	100
Concept Screening	49	40	0	11	100	17	80	0	3	100	3	81	0	17	100	20	60	0	20	100
Proto Type Test	31	60	0	9	100	14	83	0	3	100	3	83	0	14	100	20	60	0	20	100
Process Test	67	33	0	0	100	59	38	0	3	100	0	83	0	17	100	28	58	0	14	100

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

HS Enablers

The use of high speed enablers showed that all enablers were considered at the businesses but especially the customer enabler was in focus along with HS enablers Nos. 8 (product to process) and 9 (modularisation).

It was verified that all enablers were in use as seen in Table 11.30; however, the HRM enabler and the e-development enabler were not so much in use. The focus group interview still verified that the businesses’ use of the enablers was very much on an ad hoc basis and not very much related to the task of product development which had 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 maybe two of the enablers e.g. mainly the customer and the modularisation enabler. They used these enablers in all high speed approaches and all through the product development process.

Table 11.30 HS enablers used in the survey businesses

	Very Much	In Some Cases	No	Do Not Know	Total
ICT Communication Enabler	15	45	33	6	100
Customer Enabler	71	26	3	0	100
PD Model Enabler	21	42	24	12	100
Network Enabler	32	53	9	6	100
Innovation Enabler	18	56	18	9	100
HRM Enabler	9	29	56	6	100
Process Enabler	15	62	18	6	100
Product to Process Enabler	27	45	21	6	100
Modularisation Enabler	29	34	17	20	100
E-Development Enabler	9	37	37	17	100

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.

11.7 Success Criteria of HS PD

The research verified that the businesses were very focused on short-term success criteria – particularly performance and time. The businesses had minor focus on long-term success criteria and in a long term perspective focus was primarily on continuous innovation as seen in Table 11.31.

Table 11.31 Priorities of success criteria at survey SMEs

Priorities	Time	Cost	Performance	CIM	CI	L
1	41	22	46	27	27	19
2	32	32	38	32	30	38
3	14	30	3	19	24	22
4	11	11	5	16	14	8
5	3	5	5	0	5	11
NA	0	0	3	5	0	3
	100	100	100	100	100	100

Nevertheless, the survey verified that the priorities of success criteria change from one business to another as can be seen in Table 11.32 during the product development stage and gates.

As can be seen, time and performance was the central success criteria during the product development process as seen in Table 11.32. When the product development project reached the screening gates time – and indeed

Table 11.32 Specific priorities of success criteria at the survey SMEs

Priorities	Idea	Concept	PD Stage	Process Stage	Idea Screening	Concept Screening	Proto Type Test	Process Test	Implementation
Time	21	21	38	21	27	21	24	18	52
Cost	0	12	18	41	3	6	12	27	9
Performance	24	24	35	15	18	18	53	36	24
CIM	18	15	0	12	15	18	0	0	3
CI	32	18	3	0	9	6	0	0	3
L	3	3	3	3	6	9	9	12	3
Na	3	9	3	9	21	24	3	6	6
Total	100	100	100	100	100	100	100	100	100

NA = Not answer
Question wording: Hvilke succeskriterier er mest afgørende for Deres produktudviklingsprojekter i følgende faser?

at the time of prototype test – performance came most in focus. Time was the most important success criteria in the implementation phase.

The survey businesses differed very much when it came to putting priorities on the success criteria in a product development project. The survey verified that there was hardly any focus on long-term success criteria.

11.8 Time, Speed and PD

The focusing on time dominated the product development stage particularly in all initial screening gates, and the implementation stage.

Speed and HS PD was a major issue and challenge to the SMEs involved, and most businesses involved focused on this challenge in their product development. The businesses defined time and speed within physical time and they were very much focus on time and speed from idea to market introduction – “time to market”.

Time and speed in most businesses were transformed to cost and direct cost and cost had a central placement in the formulation of success criteria to a product development project.

Performance was very much in focus at the last gates of the product development process.

On the long time success criteria area the businesses had a somewhat more poor focus. The businesses put a although 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.

11.9 Reflection

On behalf of the survey the following hypotheses could be verified and not verified as seen in Table 11.33.

Table 11.33 Verification table of Chapter 11
Empirical Results – Survey

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.	Not 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)	Not 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	Not 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.	Partly Verified
	HS PD success criteria can be formulated as short term and long term success criteria.	Partly 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.	Not verified

