

PROJECT European Support



Länsteknikcentrum i Jönköpings Län

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*by*

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**STUDY**

**TOOLS & METHODS OF  
PRODUCT DEVELOPMENT<sup>(I)</sup>  
(IDEA GENERATION)  
*Innovation Management***

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This study was made on 21 Swedish Companies during December 2004.  
Below you will find a summary of the questions and detailed answers of the questions.

## 1 Short summary of the questions

### Question 1

The companies which participated in the study comes mainly from the manufacturing industry.

### Question 2,3

38% of the companies have more than 250 employees and 66% of the companies has existed between 11-50 years.

### Question 4

The strategies they use for success in the market is mostly customer orientated (71%), but there is also market leadership as well as innovation orientated (57%).

### Question 5

All of the basic conditions for innovation friendly companies in the study are quiet important (mark 2 in the study).

### Question 6

Quantity (52%), quality and price (48%) are the specifications that can be improved by product development. However this question was misunderstood by some of the companies.

### Question 7

R&D is highly integrated in the product development (21%). Sales, Production and management are also highly involved (about 30-40%). HR is hardly ever involved (67%).

### Question 8

All companies knows about ISO 9000 but not all uses it (81% use). All except one knows about EMAS etc (because the company has newly started).

### Question 9

Use of environmentally friendly materials (48%), recycling (48%) and easy to maintain (38%) is most important aspects in design of new products.

### Question 10

The essential restraints which is not repressive for innovation, is integration of external experts (52%) and use of methods and tools (48%).

### Question 11

The companies detect ideas internally from individuals (76%) and from market and competition analysis (71%). Externally they get motivated by customers (90%).

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## Question 12

The criteria's of an innovation method to be used by a company are mostly structured description of customers requirements (57%), fostering team work (52%) and early recognition of error risks (52%). This question was not answered by all respondents because they thought it was a difficult and unfamiliar type of question.

## Question 13

The companies uses brainstorming (90%) and thinks it's super and SWOT analysis which also is a good method (57% marked 1 or 2 for "super"). No one knows about TRIZ. Other useful methods is FMEA (62%).

## Question 14

The companies involves customers (86%), R&D (67%), universities (57%) in their development process.

## Question 15

General knowledge is the most common training possibilities (86%). Other training is offered by about 50% of the companies.

## Question 16

The most common criteria's for selection of training participants are discussions between employers and employees (81%), engagement at work (57%) and analysis of education requirements (57%).

## Question 17

Most of answered people belongs to General management (52%).

## Question 18

The most important environmental problems defined is energy, transports, recycling and travel.

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## 2 Detailed result of the questions

<b>Question</b> In which industry does your company operate ?	
<b>1</b>	
*****	10 Manufacturing of basic metals 1 Manufacturing of lighting 1 Manufacturing of instruments and applications for training and simulation 2 Manufacturing of parts for motor vehicles 2 Other manufacturing 1 Transport, storage 4 Consultancy

<b>Question</b> How many employees does your company employ?				
<b>2</b>				
*****	1-10	11-50	51-250	250<
	3	5	5	8

<b>Question</b> How many years does your company exist?			
<b>3</b>			
*****	0-10 years	11-50 years	50< years
	1	14	6

<b>Question</b> Which strategies does your company embark on for success in the market?		
<b>4</b>		
*****		Use
1	quality leadership	6
2	price / cost leadership	5
3	market leadership	12
4	customer orientation	15
5	environment orientation	5
6	innovation orientation	12
7	no strategy known	1

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<b>Question 5</b>		Which basic conditions do in your experiences signalise innovation friendly companies?	
		very important	unimportant
<b>1</b>	promotion by management (colleagues acceptance)	1 2 3 4 6 8 5 2	
<b>2</b>	time for searching new ideas	1 2 3 4 9 9 3 0	
<b>3</b>	financial resources	1 2 3 4 9 10 2 0	
<b>4</b>	use of methods and tools (e.g. creativity methods)	1 2 3 4 4 9 8 0	
<b>5</b>	team work	1 2 3 4 9 11	

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		1 0
6	scope for development of unorthodox ideas	1 2 3 4  9 11 1 0
7	integration of external experts	1 2 3 4  5 11 5 0
miscellaneous	<i>"To have the guts!"</i>	1 2 3 4  1

Question		Which product specifications can for your opinion be improved with product development?
6		
*****		
1	Price	a b c d e  10 8 1 2

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		0
2	Quality	a b c d e  10 8 1 2 0
3	Quantity	a b c d e  1 2 11 5 2
4	Image	a b c d e  4 5 4 5 3
5	Launch	a b c d e  1 2 3 5 9



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Note: Some of them misunderstood how to answer this question, for example has one filled in the form with (a,b,b,b, )

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<b>Question</b>		Which departments of your company are integrated in the product development process?		
<b>7</b>				
*****		department not existent	highly	hardly ever
<b>1</b>	Research & Development	8		1 2 3 4 12 0 0 0
<b>2</b>	Sales	2		1 2 3 4 9 1 7 1
<b>3</b>	Marketing	2		1 2 3 4 6 5 5 1
<b>4</b>	Production	3		1 2 3 4 8 6 2 1



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5	Human Resources	3	1
			2
6	Management	1	3
			4
			4
			7
			7
			3
			2
			14

<b>Question 8</b> Which management systems or standards do you know / do you use?			
		know n	in use
1	ISO 9000 ff	21	12
2	EMAS / ISO 14000 / BS 7750	20	12
3	Prepare	6	1
5	integrated management systems	6	3

<b>Question 9</b> Which aspects of environmental product design are considered by your company?			
		very important	unimportant
1	use of environmentally friendly materials	1	
		2	
		3	
		4	
		8	
		10	
		2	
		1	
2	recycling of materials	1	
		2	

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		<p>3 4</p> <p>10 6 4 1</p>
3	easy to maintain or to repair	<p>1 2 3 4</p> <p>8 5 5 0</p>
4	sustainable development	<p>1 2 3 4</p> <p>6 4 4 4</p>
5	eco balances (Stoffstromanalysen, ...)	<p>1 2 3 4</p> <p>3 4 6 5</p>

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<b>Question 10</b>		<b>What do you think are the essential restrains for innovation in your company?</b>	
<b>*****</b>		<b>very repressive</b>	<b>not repressive</b>
<b>1</b>	promotion by management (colleagues acceptance)	1 2 3 4 0 2 8 7	
<b>2</b>	time for searching new ideas	1 2 3 4 7 7 4 1	
<b>3</b>	financial resources	1 2 3 4 6 5 7 2	
<b>4</b>	use of methods and tools (e.g. creativity methods)	1 2 3 4 1 4 10 4	
<b>5</b>	team work	1 2 3 4	

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		4 4 7 4
<b>6</b>	scope for development of unorthodox ideas	1 2 3 4  2 6 8 4
<b>7</b>	integration of external experts	1 2 3 4  1 6 11 2

<b>Question 11</b> How do your company find/detect ideas for product development?		
*****	12a.) internal	*****
<b>1</b>	sales / customer statistics	12
<b>2</b>	market and competition analysis	15
<b>3</b>	with team work	11
<b>4</b>	from individuals	16
*****	12 b.) external	*****
<b>1</b>	technical literature	6
<b>2</b>	motivation through costumers	19
<b>3</b>	consultants	7
<b>4</b>	R&D institutions	13

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<b>Question 12</b> Which criteria must a "innovation method" provide to be used in your company?		
*****		
<b>1</b>	design of a "ideal product" to derive medium- and long term intentions for product development	4
<b>2</b>	description of my product/process with general trends of evolution	6
<b>3</b>	development of the main contradiction, which have to be overcome, to achieve inventive solutions	5
<b>4</b>	fostering team work (creativity inside teams)	11
<b>5</b>	abstractions of problems to increase creativity	5
<b>6</b>	database of physical effects (e.g. How can we move liquids?)	0
<b>7</b>	structured description of customers requirements	12
<b>8</b>	using knowledge from other industries	10
<b>9</b>	integrated validation tools	2
<b>10</b>	early recognition of error risk of products and processes	11
<b>miscellaneous</b>	"Cost"	1

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<b>Question 13</b>		I. Which methods or tools are known respectively used for product development in your company?			
		II. If these methods or tools are used in your company, can you evaluate by your experience the usability of them for product development			
		knowing the method	Using the method	(1)“super“ (4)“useless“	
*****	<b>creativity methods:</b>				
1	brainstorming			1 2 3 4  10 8 1	
		21	19		
2	SWOT – analysis			1 2 3 4  3 9 3	
		18	15		
3	morphology			1 2 3 4  1	
		2	1		
4	synectics			1 2 3 4	
		1	0		
5	bionics			1 2 3 4	
		1	1		

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				1
<b>miscellaneous</b>	“Team-discussion”		1	1 2 3 4  1
<b>***** TRIZ – theory of inventive problem solving: *****</b>				
<b>1</b>	resource checklist			“No one recognized this method”
<b>2</b>	ideality – ideal product			
<b>3</b>	function and attribute analysis			
<b>4</b>	inventive principles (technical and physical contradiction)			
<b>5</b>	database of physical effects			
<b>6</b>	trends of evolution			
<b>***** other methods *****</b>				
<b>1</b>	QFD - quality function deployment			1 2 3 4  1
		5	2	
<b>2</b>	patent search & analysis			1 2 3 4  2 5 1
		11	8	
<b>3</b>	FMEA – failure mode and effects analysis			1 2 3 4  6 6 1
		13	13	



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4	cause - effect analysis (e.g. fishbone diagram)	12	5	1 2 3 4  2 3 1
5	scenario techniques	4	2	1 2 3 4  1  1
6	Pareto - analysis (ABC-analysis)			1 2 3 4  1 3
7	mind mapping	13	6	1 2 3 4  2 4 1

<b>Question</b>	Whom does your company include in the product development process?	
<b>14</b>		
*****		
1	competition	1
2	customer	18
3	R&D institution	14
4	university	12
5	technical consultant	1

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Question 15 Which training possibilities are offered by your company?		
	seminars/courses/workshops for:	
1	communicating – increase the capability of communicating	10
2	conflict management – get to know different conflict strategies	9
3	presentation – structure, composition, performance of presentations	10
4	team management – how to work in a team	11
5	Persönlichkeitsstruktur – wie bringe ich Ideen besser ein	10
6	creativity techniques – impart creative thinking and acting	4
7	general knowledge – foreign language course, computer course, technical courses etc.	18
<b>miscellaneous</b>		

Question 16 Which criteria are used for selections of training participants?		
*****		4
1	company affiliation	12
2	engagement at work	8
3	qualification	5
4	after solicitation	12
5	analysis of education requirements	17
6	discussion between employers and employees	4

Question 17 In which department of your company do you work?		
*****		6
1	R & D	4
2	Sales	6
3	Marketing	5
4	Production	3
5	EDP	1
6	Human Resources	11
7	General Management	0
8	Product Management	6
<b>miscellaneous</b>	<i>Purchase, logistics</i>	



<b>Question</b>	
<b>18</b>	Please describe in keywords the three most important environmental problems which your company is facing with ?
6	Energy (ascending prices, heating, using)
6	Transports
4	Recycling (in our products, computers, materials)
4	Travel (+ choice of company cars)
3	Hazardous metals, choice of material
3	Working environment (manual work, conditions i China, stress)
2	Discharge (from combustion engines)
1	Allergy
1	Certificated subcontractors in other countries not the same
1	Chemicals
1	Demands on fuel consumption
1	Deposition
1	Ecologic durable products
1	Finding environment thinking subcontractors
1	Greenhouse effect
1	Location
1	Painting
1	PVC free cables
1	Soldering (from tin to tin free, lead...)
1	Storage dangerous goods
1	Supply of raw materials
1	Surface treatment (Chrome)
1	Unknown problems
1	Waste

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The participating companies in the study:

- Sapa Profiler AB
- ADC of Sweden AB
- Portsystem 2000 AB
- Ahlins I Habo AB
- Smemo AB
- Unimerco Pegoma AB
- Interal AB
- Dimas AB
- Electrolux AB
- Iram AB
- Fagerhults Belysning AB
- Saab Training System AB
- Kongsberg Automotive AB
- Thule Sweden AB
- RH Form AB
- ABU Garcia AB
- Schenker Logistics
- SafeTool AB
- Epsilon Development AB
- T GUL Industriell Design
- EuroInfoCentre