

Strategic alliances and supplier associations in a Lean supply chain



Appendix

Master Thesis M Sc
Conducted at

The Technical University of Denmark (DTU)
Department of Manufacturing Engineering and Management
Supervisor Associate Professor Peter Jacobsen

The University of Tokyo Japan
Supervisor Professor Fumihiko Kimura

Nis Gjenda s011333
Søren S Stissing s012100

March 15th 2007

Abstract

An analysis of Lean made by the Federation of Danish Industries (DI, 2005) concludes that all Danish companies have heard of Lean in some form. Lean has had a lot of success in Denmark but many problems have also been experienced. The intention of this project is to deal with an area within Lean that reflects the current level of Lean development in Denmark.

The investigation in Denmark concludes that the companies are trying to diffuse the Lean principles into the supply chain which create problems. Partnerships play a great role in this, why the project scope has been set on working with strategic alliances and supplier associations in a Lean supply chain.

The Japanese companies are world leading in terms of Lean and we have had a unique possibility to investigate eight of them during a four months period in Japan. Outcome of this, combined with a field trip to Toyota's headquarters in Europe (TME in Brussels), form the foundation for the fieldwork that is used during the project.

Parallel with that, literature has also been studied. Results of this combined with fieldwork are expressed in a procedure for entering a strategic alliance. An overview of the process is created and critical areas are pointed out. Furthermore, a number of conditions needed for making our procedure work have been identified, and possible tools on the way are explained. This can be thought of as the main result.

The Japanese culture is often cited to be the reason for their success. There are of course a number of differences between Japan and Denmark which are important to be aware of, but we believe that it is possible to adopt the Japanese approach to the Danish conditions.

Some of the most important conclusions from the fieldwork are the importance of having good relationships with the suppliers. This is essential to create sustainable competitive advantages. Furthermore, it is necessary to see the fact, study the process and learn through experiences in order to *really* understand. It is fundamental and applies to *everyone* in the organisation. The passionate and very skilled employees were also pointed out as a necessity, because working closely with suppliers require care and great attention. Developing and maintaining good personal relations are as important to focus on, as the actual performance improvements. For this reason management commitment is essential and it must be realized how much it requires to make strategic alliances work. Also, Japanese and Danish companies have been compared with regards to level of Lean development. Overall, Danish companies are doing a good job.

In order to use the procedure, we have made a recommendation for the Danish companies to use. This includes suggestions and certain issues that must be realized to achieve full benefit of the procedure. Finally, a discussion is made concerning future work of the procedure. Working with strategic alliances is demanding and the area is very big. For this reason it has not been possible to dig deep into every area.

Acknowledgements

This project is greatly based on information gathered from several companies in Denmark, Japan and Brussels. Without these possibilities for research, the project would not have been the same, and we are deeply grateful for this. All the people interviewed have been very helpful and accommodating.

Especially, we would like to express our gratitude to Professor Kimura, our Japanese supervisor at The University of Tokyo, Japan. He has helped and supported us during our stay in Japan, and helped us develop our project to a higher level. Furthermore, the company visits both in Japan and Brussels would not have been possible without the big effort from Professor F. Kimura. We know how much work he has put into this, and we cannot thank him enough.

We would also like to thank Associated Professor Peter Jacobsen at The Technical University of Denmark. He has been very supportive during the project, and the one together with Professor Leo Alting, who made it all possible because they arranged the contact to Professor Kimura. Thank you, Peter and Leo.

Thanks to all the participating Danish companies for the valuable inputs throughout the project, and their willingness to share information on their experiences with Lean.

Also, we would like to thank the people from the Japanese companies; Toyota, Toyoda Gosei, Ichiei, Otics, NEC, Kawasaki, Denso and Hitachi. They were willing to tell us about their business, and answer all our questions. This gave us a unique possibility to study Lean in Japan. This we are very thankful for.

Thanks to Ph.d. Jørgen Jørgensen for providing the program hotComm which enabled us to communicate with the Danish companies during our stay in Japan.

Thanks to the people at Toyota Motor Europe, Brussels for the valuable input towards our procedure. Their willingness to share information has been very valuable and gave us a chance to validate our procedure and conclude on cultural differences.

Also, thanks to the other members of Kimura lab and the International Center at The University of Tokyo, Japan for making our stay in Japan possible and enjoyable.

Finally, we would like to thank our families and friends in Denmark and Japan for supporting us when needed during the project. We could not have done it without you.

Copenhagen, March 15th, 2007

Nis Gjendal

Søren S. Stissing

Preface

This paper is conducted as the master thesis for the Master of Science degree within the field of production and management at The Technical University of Denmark (DTU) and at The University of Tokyo, Japan. It has been carried out on the basis of both empirical work and literature studies, and deals with strategic alliances and supplier associations in a Lean supply chain. A number of companies from Denmark, Japan and Brussels have been investigated.

The work has been carried out in the period March 2006 to March 2007 and it amounts to 35 ECTS points. The work has been divided into three different stages. The first from March to July 2006 is an analysis of the level of Lean in Denmark in order to determine the focus of the project. This was done through interviews with eight different Danish companies and done parallel with other courses at DTU. The second period from August to December 2006 involved research of eight different Japanese companies to experience how things are done at the origin of Lean – in Japan. The research was done at The University of Tokyo, Department of Precision Engineering, Professor Kimura Lab through an exchange program between The Technical University of Denmark and The University of Tokyo. Professor F. Kimura was our supervisor during this period. The last period in Denmark from January to March 2007 has dealt with follow-up on the results gained in Japan, and analysing how things can be applied in Denmark taking the differences and similarities between Japan and Denmark into consideration. The results are mainly presented in a procedure for entering a strategic alliance. Furthermore, this period included a visit to Toyota Motor Europe (TME), Brussels, where we had the opportunity to investigate how Toyota deals with suppliers in a western culture.

The visit in Japan has added an interesting dimension to the project since experiences gained here cannot easily be read in literature. It has been very interesting to visit the Japanese companies, and experience how things are done. Also, our life in Japan has aided to the understanding of the Japanese culture, giving us a basis for judging how much influence this has on the performance of the Japanese companies.

Our main supervisor throughout the project has been Associated Professor Peter Jacobsen. Professor F. Kimura has also been of great help especially during the stay in Japan arranging company visits.

Table of contents

PART 1	INTRODUCTION.....	1
1.1	BACKGROUND AND MOTIVATION	2
1.2	PROBLEM STATEMENT	3
1.3	SCOPE & LIMITATIONS	3
1.4	APPROACH	6
1.5	METHODOLOGY	7
1.6	READING GUIDANCE.....	9
PART 2	LEAN THEORY	11
2.1	INTRODUCTION	12
2.2	LEAN CRITIQUE	17
2.3	OUR OWN DEFINITION OF LEAN.....	18
PART 3	ANALYSIS OF LEAN IN DENMARK.....	19
3.1	INTRODUCTION	20
3.2	METHOD	20
3.3	LEVEL OF LEAN DEVELOPMENT	22
3.4	PART CONCLUSION	28
PART 4	THEORY.....	30
4.1	INTRODUCTION	31
4.2	LEAN SUPPLY CHAIN	31
4.3	STRATEGIC ALLIANCES	37
4.4	SUPPLIER ASSOCIATIONS	46
4.5	KEIRETSU.....	51
4.6	BEST PRACTICES.....	53
4.7	THE ROLE OF SMES	56
4.8	PART CONCLUSION	58
PART 5	FIELDWORK IN JAPAN	59
5.1	INTRODUCTION	60
5.2	METHOD	60
5.3	TOYOTA MOTOR COMPANY	61
5.4	NEC PERSONAL PRODUCTS	69
5.5	KAWASAKI HEAVY INDUSTRIES, LTD	71
5.6	DENSO.....	72
5.7	HITACHI	73
5.8	PART CONCLUSION	75
PART 6	COMPARING JAPAN & DENMARK	77
6.1	INTRODUCTION	78
6.2	THEORY	78
6.3	THE INDUSTRY	81
6.4	NATIONAL CULTURE	84
6.5	PART CONCLUSION	87
PART 7	FIELDWORK IN BRUSSELS.....	90
7.1	INTRODUCTION	91
7.2	METHOD	91
7.3	TPS IN EUROPE.....	92
7.4	WORKING WITH SUPPLIERS IN PURCHASING	93
7.5	PART CONCLUSION	101
7.6	CONCLUSION ON THEORY AND FIELDWORK	103

PART 8	THE PROCEDURE	105
8.1	INTRODUCTION	106
8.2	PURPOSE, REQUIREMENTS, LIMITATIONS AND ASSUMPTIONS	107
8.3	STRUCTURE.....	108
8.4	INITIATION STATE.....	110
8.5	DEVELOPMENT STATE	114
8.6	MATURE STATE.....	121
8.7	AREAS TO ADDRESS	124
8.8	TIME AND RESOURCES.....	125
8.9	PROFITS AND SHARING BENEFITS	126
8.10	MANAGE DANISH CHARACTERISTICS	127
8.11	PART CONCLUSION	128
PART 9	CONCLUSIONS.....	130
9.1	RECOMMENDATIONS	131
9.2	HOW ARE DANISH COMPANIES DOING?	133
9.3	MYTHS ABOUT JAPAN	136
9.4	FURTHER WORK	138
9.5	FINAL CONCLUSION.....	139
PART 10	REFERENCES & GLOSSARY	141

Part 1 INTRODUCTION

Part one outlines the purpose of the project and details the approach used.

First, in the section on background and motivation, it is explained why the master thesis has been carried out. Subsequent, the objectives of the project is outlined, and an explanation of scope and limitations follows. Before giving a reading guidance, the method used is explained.

CONTENT

- 1.1 BACKGROUND AND MOTIVATION
 - 1.2 PROBLEM STATEMENT
 - 1.3 SCOPE & LIMITATIONS
 - 1.4 APPROACH
 - 1.5 METHODOLOGY
 - 1.6 READING GUIDANCE
-

1.1 Background and Motivation

In recent years Danish companies have seen the potential in the Lean philosophy and how significant the results are, when implementing it. Most companies have realised that something can be gained and many are working successfully internally with Lean. But there are also many problems in connection with the implementation and questions arise. How is Lean diffused into the supply chain and how to make sure that the expected benefits are gained? This is illustrated below:

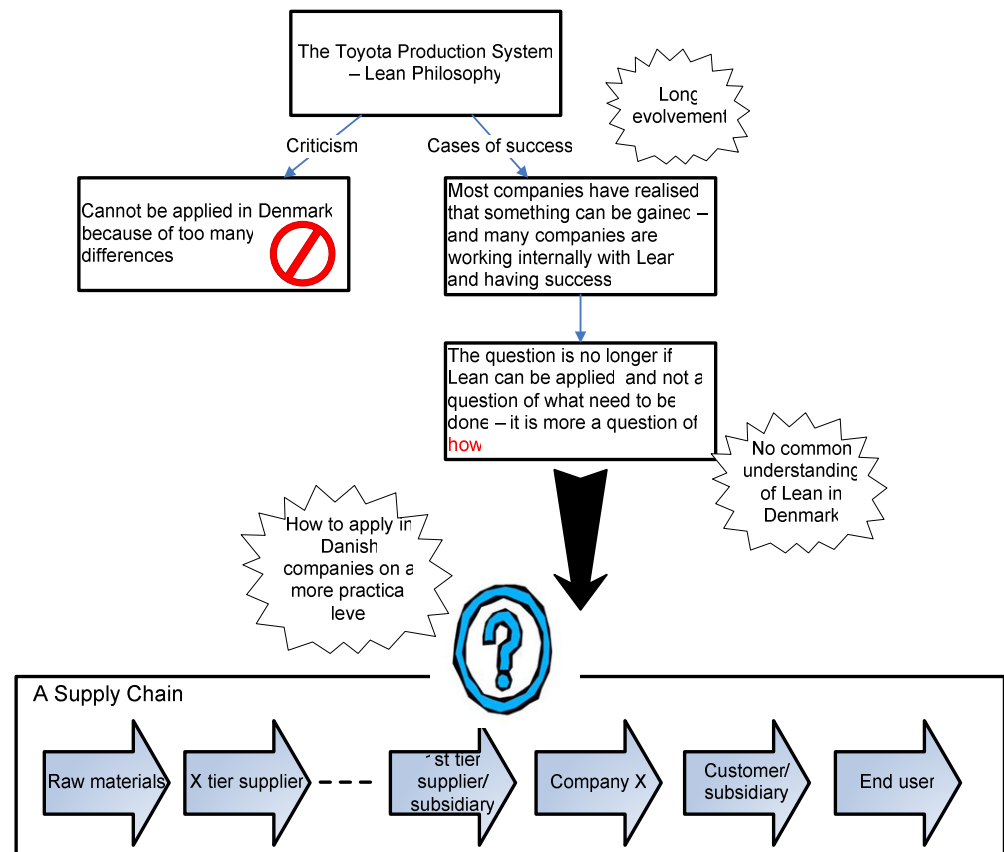


Figure 1 – How to apply the Lean Philosophy in Danish companies

The question is no longer if Lean can be applied in Denmark, and not what needs to be done since many experiences have already been made by examining e.g. Toyota. It is more a question of *how* to do it on a more practical level.

The Danish companies are on different stages of development regarding Lean. In the years to come they will face the problems concerned with spreading Lean into the supply chain. We believe that strategic alliances and supplier associations will play a significant role in this process, why focus has been put on this topic for the master thesis. It is widely recognized that the partners of Toyota have a great part to play in the success. Ohno (1988) also claims that Toyota could never have done it alone, Milgate (2001) says that the future involves strategic alliances, and Mr. Adams (TME interview, 2007) says that one of Toyota's strengths is the supplier network.

“Toyota isn’t winning by itself. It’s winning with its supply chain. There is a huge lesson from Toyota on how to manage supplier relationships”

Torinus (2006, p. 1)

By focusing on the next stage of Lean and by maintaining a dialogue with the participating Danish companies throughout the entire project, we make sure that the process is dynamic and in line with the wishes of the Danish industry. A practical project is created for the companies to use when facing problems regarding Lean and close relationships.

1.2 Problem Statement

Because of the intent to create a dynamic project with a focus adapted to the wishes of the Danish industry, the problem statement has evolved over time. The objectives have been created throughout the project in an interaction with deeper knowledge gained in literature studies, communication with Danish companies, and the possibilities to investigate Japanese companies.

By considering the different realities in Denmark and Japan and at the same time acknowledging the underlying concepts of Lean, it is possible to examine how strategic alliances and supplier associations are build and maintained in a Lean supply chain.

Because Japanese companies, and particularly Toyota, are world-class companies, we believe that much can be learned by studying them in their approach towards their partners.

With Japanese companies as a starting point – especially Toyota – an analysis will be conducted with the purpose to set up a procedure for Danish companies to follow, when entering a strategic alliance/supplier association in a Lean supply chain

Focus will in other words be put on partnerships and how to spread Lean into the supply chain, since we believe that Danish companies will be faced with these problems in the years to come.

1.3 Scope & limitations

The Lean philosophy can be looked at in three different levels depending on the single company’s stage of development, see the following figure. The principles are applied to a bigger and bigger part of the company ending with the entire supply chain. This project focuses on the Lean enterprise level.

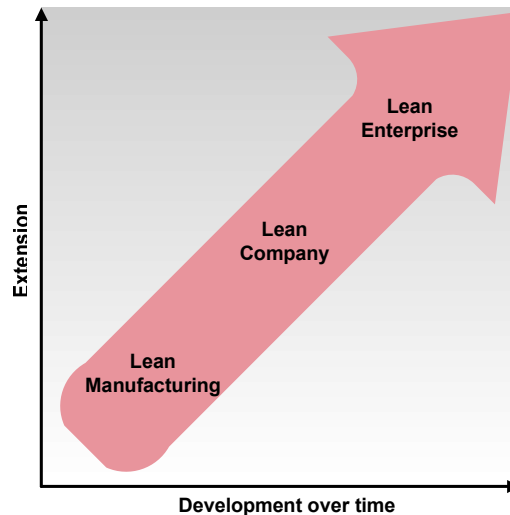


Figure 2 – Historic scope of Lean (Inspired by Womack & Jones, 2003 and Thomsen & Munkesø, 2005)

The three levels cannot be thought of individually. Rather, they interact with each other.

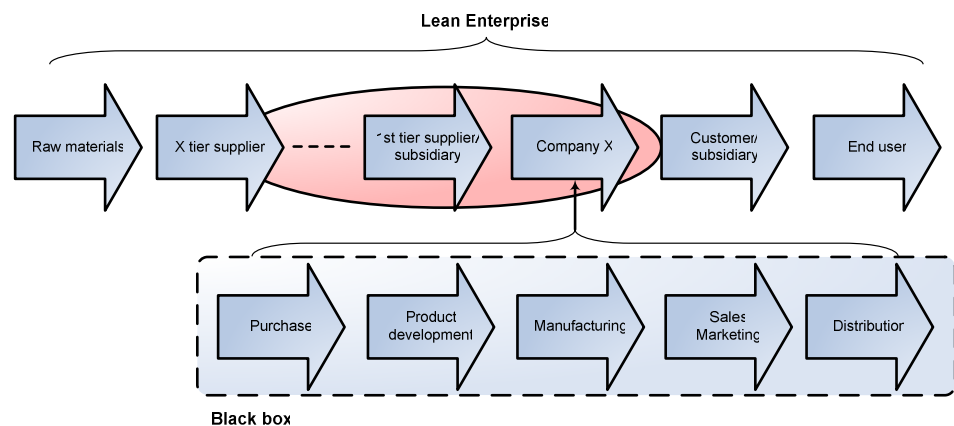


Figure 3 – Limitation of the project

The approach is to see the manufacturing level and company level as black boxes. It is the relationship between the companies in the supply chain that is interesting. Of course the internal conditions cannot be ignored because answers to external conditions might be hidden here.

It has been the intention to build a procedure for entering a strategic alliance taking the characteristic of the Danish culture into consideration. The goal is to create an overview of the process and draw attention to critical areas. The procedure takes the perspective of a bigger company working with a number of suppliers. Small and medium sized companies which make up the biggest part of Danish industry (Jensen, H., 2006 and Martin & Olds, 2004) can of course also use the procedure since they represent one part of the relationship. The principles can also be used towards the customer/subsidiary side of the supply chain, but in the research of Japanese companies, the examination is concentrated on the supplier side of the supply chain. More details

on purpose, requirements, limitations and assumptions regarding the procedure can be found in Part 8 – The procedure.

The procedure can also be used for supplier associations since this is an extension of strategic alliances (see Part 3 – Theory). Relationships are built on a one-to-one basis to begin with, and we believe that this is currently the starting point for the Danish companies. Supplier associations will follow in the years to come, which also can be achieved with the help of our procedure.

It is not the intention to convince the companies to enter into strategic alliances and supplier associations. We want to help in the process when the need is *already* there – how to involve the suppliers and make it work as a normal part of business.

Concerns

One might point out that the investigated Japanese companies are very large, and for this reason parallels cannot be drawn to the Danish industry. But as argued in Part 3 – Theory, Lean can be used by most companies if it is seen as a philosophy and not a toolbox. For this reason, we believe that it makes good sense to investigate the bigger Japanese companies. There are a lot to learn from them, since they have done many valuable experiences and are world-class manufacturers.

The participating industrial Danish companies belong to some of the bigger players in Denmark, and therefore one might point out that generalizations should not be made concerning smaller companies. Though, it has been tried to cover the Danish industry by turning to consultants and The Federation of Danish Industries (DI). Furthermore, it has been necessary to look at the Danish industry as one homogenous representation, when looking for applications of the identified areas from Japan because of limited resources and time.

One aim of this thesis is to create a practical paper which can be used by the Danish industry. For that reason emphasis is put on the practical and empirical work, and to less extent on theoretical studies. Focus will be on overall aspects not going into detail because this would narrow down the application area. Only few experiences have been made in Denmark handling different aspects of strategic alliances and supplier associations in a Lean supply chain, so there is a lot to learn from the Japanese companies.

1.4 Approach

The project is carried out in three different stages

- **Stage 1:** Searching for literature and information plus establishing partnerships with eight different companies in Denmark. In this way a study of the level of development regarding Lean in Denmark is carried out, and a basis for analysis in Japan is created.
- **Stage 2:** Study of Lean in Japan with focus on strategic alliances and supplier associations in a Lean supply chain. The research is based on practical work, theoretical work and research at The University of Tokyo under the guidance of Professor F. Kimura. Contact with the participating Danish companies was maintained which gave us valuable input to our findings and secured the relevance of the chosen focus.
- **Stage 3:** Pick up on results and experiences in from Japan. Further research is conducted in collaboration with the Danish companies in order to apply what we have learned in Japan. Furthermore, a visit to Toyota Motor Europe (TME) is made. In this way comparisons between Western and Japanese conditions can be made. Conclusions of the master thesis are made.

The timeframe of the project and the participating companies can be seen on the following figure:

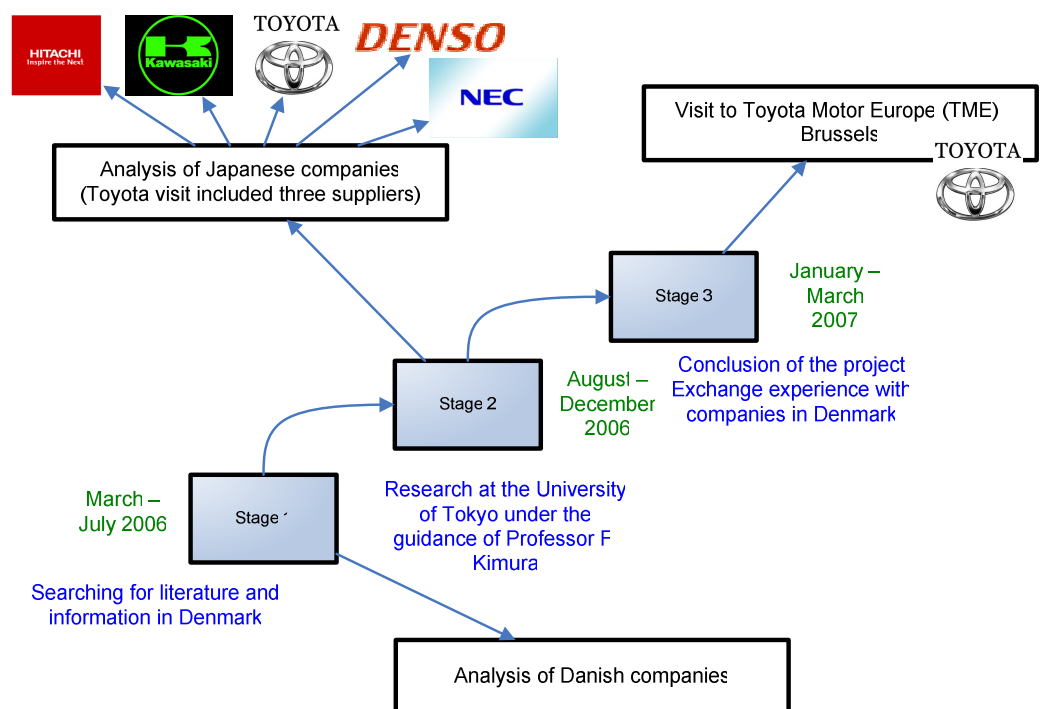


Figure 4 – Time frame for the project

1.5 Methodology

The overall methodology used in this project can be seen from the following figure:

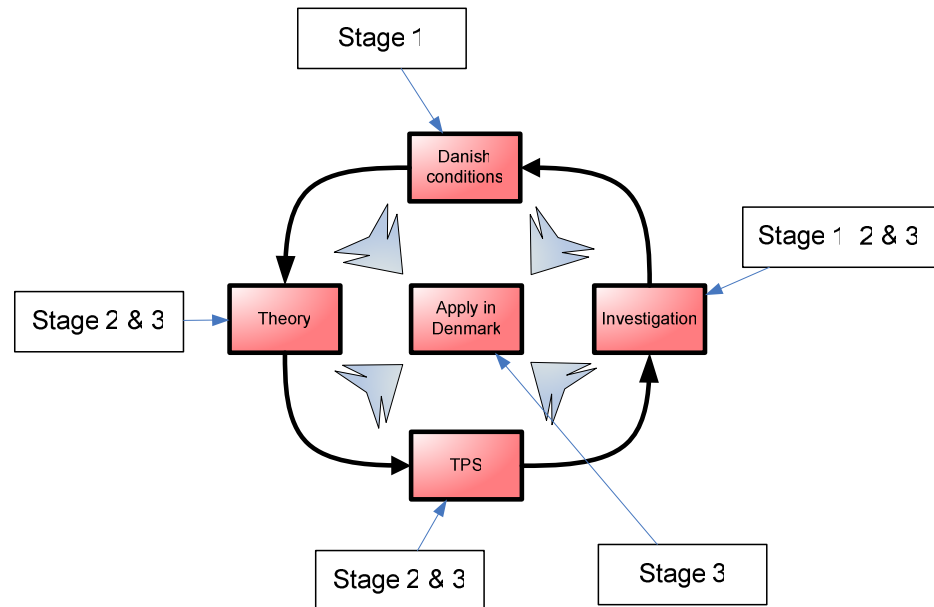


Figure 5 Project methodology

As seen, a number of areas must be investigated before the successful application of Japanese conditions in Denmark can take place. The literature on strategic alliances and supplier associations in a Lean supply chain is not straight forward, and the results have therefore been developed as an interaction between literature studies and empirical work.

Based on the investigation of Toyota Production System (TPS) in Japan and different theories, an application in Denmark is sought, taking the differences between Japan and Denmark into consideration. It is important in order to be successful when transferring the principles from Japan to Denmark. The process is continuous throughout the project, but as seen from the figure, the focus is changed during the different stages of the project.

1.5.1 Research plan

Finding answers to research objectives involves collection of data which must be done in a structured way (see e.g. Kotler & Keller, 2006). Both primary and secondary sources have been used in the form of interviews with the participating companies and literature studies.

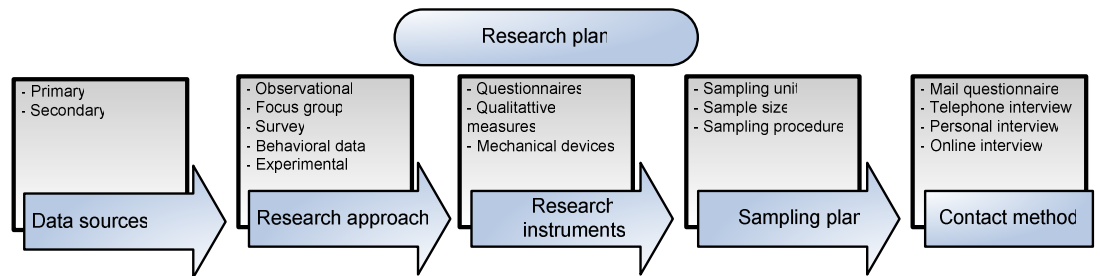


Figure 6 Research plan (adopted from Kotler & Keller, 2006)

As seen, the empirical data can be collected in different ways. Overall, the intention has been to collect as much data using the smallest amount of resources. It has been important to collect as many impressions as possible, in order to obtain width in the research. Because of its flexibility, a good approach is to use open-ended questionnaires in arranged personal interviews. In this way it is possible to interpret both spoken words and the body language plus ask follow-up questions (Kotler & Keller, 2006).

Because of time limitations it has not been possible to use a representative sample size. The composition of the sample has been limited by the possibilities of the companies – e.g. not all contacted companies had the time or desire to participate and we could not ourselves decide who we wanted to speak to. Furthermore, the Japanese companies were chosen based on the contacts of our professor in Japan because of the formality in Japanese culture.

The empirical work has been done differently throughout the stages of the project:

Stage 1 - Denmark

With the purpose to get an overview of the problems facing Danish industry and decide on the objective of the project, general questions were asked. Because we arranged everything ourselves, it could be done in a structured way on the basis of a common set of questions.

Stage 2 - Japan

In Japan the objective was to look for answers to the identified problems, why a more thorough investigation was required. The research was more specific as a starting point since the focus areas had been determined. The type of questions was changed as more knowledge was gained continuously.

Stage 3 - Brussels

The work carried out in Brussels was based on our procedure and specific questions were asked in this connection. We had a unique possibility to get their critique and hear how work is done in Europe, so the discussion was very open.

Further details on the method can be seen in the individually part of the report.

1.5.2 Critique

The missing common structure in the research plan has its drawbacks. One should be careful of extracting too much from one interview because it is difficult to confirm its

correctness. Furthermore, the missing structure makes it difficult to compare the data in a direct way. The chosen method is time-consuming and with the wide scope of the thesis and the limited time for questions, it has not been possible to cover all aspects in depth at all companies.

The chosen method of questionnaires and personal interviews also has its limitations. The understanding of the answers is subject to interviewer bias or distortion (Kotler & Keller, 2006). Also, questions can often be asked to get the answer wanted.

The language and culture has also created a barrier. The interaction between people is not the same in Denmark and Japan, which must be taken into consideration.

"I can only express myself in English 80% correct and you might only understand 80% correct. It means only 64% is actually going to be true"

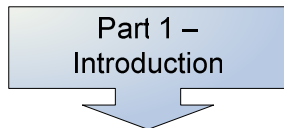
Mr. Miura (TMC interview, 2006)

To reduce some of the drawbacks the findings have been discussed intensively and compared with literature and other companies before concluding anything. We have been aware of the drawbacks and tried to act accordingly.

1.6 Reading guidance

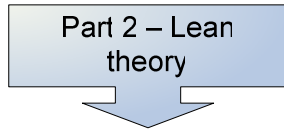
This version of the master thesis is public, and therefore the participating Danish companies will be referred to as Company A, B and so on.

It is assumed that the reader has a certain level when it comes to technical terms within Lean and different production concepts. A glossary is found at the end. References throughout the report are written in the following way (author(s), year) in terms of literature and (company/person (Mr.) interview, year) in terms of fieldwork. Summaries from the fieldwork are found in appendix. This project will be referred to as master thesis or project.



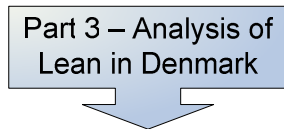
Part 1 – Introduction

An introduction to the project is given – the objectives, limitations, scope and method used.



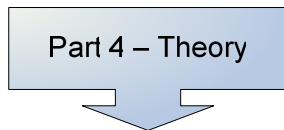
Part 2 – Lean theory

After being in Japan and experiencing Lean at its origin, we have made our own perception of Lean which is explained.



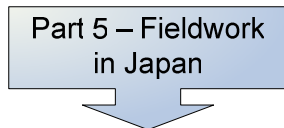
Part 3 – Analysis of Lean in Denmark

It is an aim to make the project dynamic and adjust it to the wishes of the Danish industry. For this reason eight Danish companies have been interviewed. The problems have been identified to form the basis for the subsequent analysis conducted in Japan.



Part 4 – Theory

After focus of the project has been determined, literature on strategic alliances and supplier associations in a Lean supply chain have been examined.



Part 5 – Fieldwork in Japan

Eight Japanese companies are investigated. Many valuable conclusions are made on strategic alliances and TPS.



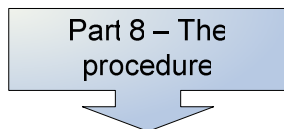
Part 6 – Comparing Japan & Denmark

Differences and similarities between Japan and Denmark are found, and the importance of culture is evaluated. This is important to take into account when applying the results from Japan in Denmark.



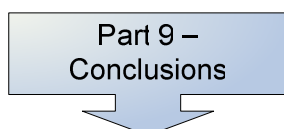
Part 7 – Fieldwork in Brussels

A visit was made to TME in Brussels. Valuable information for the procedure was gained, and the cultural influence on doing business discussed.



Part 8 – The procedure

The findings from Japan and Brussels are applied in Denmark taking the differences between Japan and Denmark into account. The application has been a procedure for entering a strategic alliance in a Lean supply chain. The intention is to create an overview of the process and draw attention to critical areas in order to help the Danish companies in the process.



Part 9 – Conclusions

A number of conditions needed for making our procedure work are drawn out. Additionally, a comparison between Danish and Japanese companies is made concluding their level of Lean development. A number of myths towards Japan are discussed and a final conclusion is made.

References are found at the end of the master thesis.

Part 2 LEAN THEORY

After being in Japan and seeing TPS in practice we have build our own perception of Lean, which is of course supported by some of the many authors. This section is meant to give our own view of Lean in a basic form.

CONTENT

- 2.1 INTRODUCTION
 - 2.2 LEAN CRITIQUE
 - 2.3 OUR OWN DEFINITION OF LEAN
-

2.1 Introduction

Much has been written and said about Lean. It is a very hot topic at the moment why many different people have an opinion about it. Especially the books "Toyota Production System" (Ohno, 1988), "The machine that changed the world" (Womack et al., 1991) and "Lean Thinking" (Womack & Jones, 2003) have created an enormous attention to TPS and the following Lean concept. Other books have followed on how to implement Lean in different aspects – e.g. "Seeing the whole" (Jones & Womack, 2003) and "The new Lean toolbox" (Bicheno, 2004) – presenting different tools and methods. Many other authors give their opinion in different articles because they want to play a role in the discussion. Others again criticize Lean to make themselves noticed (see e.g. the discussion by James, 2005). It is in other words sometimes difficult to grasp what Lean is all about.

2.1.1 TPS vs. Lean

The term Lean is based on TPS (Jones & Womack, 1991), and TPS has evolved over a very long time (Ohno, 1988), so the concept is very well tested, and the results of Toyota worldwide show that it is worth pursuing!

TPS

When talking about Lean the TPS house is often referred to:

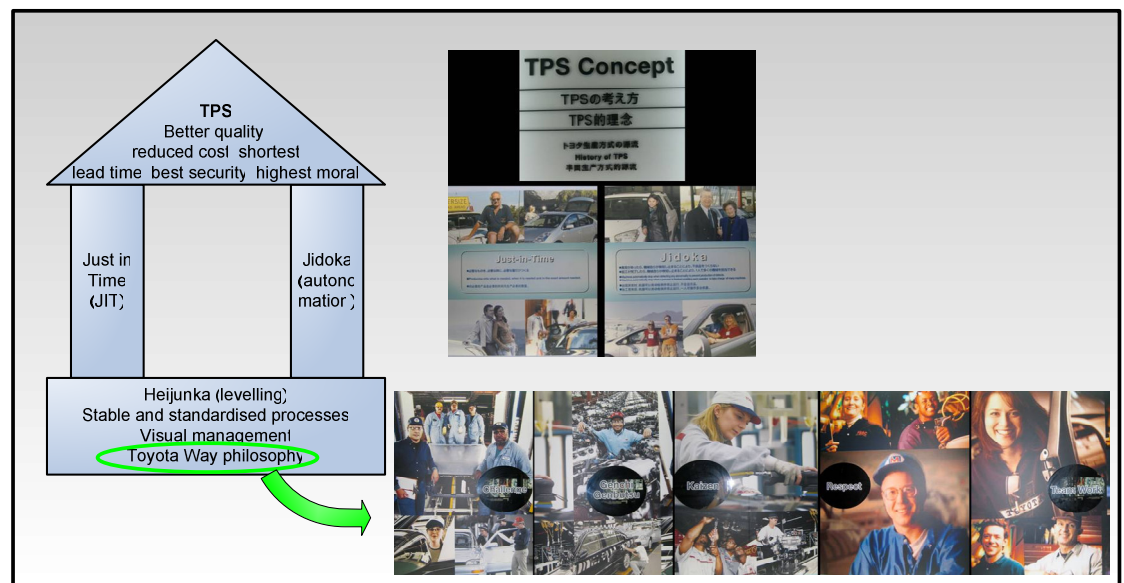


Figure 7 - The TPS house (adopted from Liker, 2004 and Michelsen, 2006)

The first pillar is Just in Time (JIT) which is about producing only what is needed when it is needed. The other is *jidoka* (autonomation) which is automation with a human touch. It is important that errors become visible and that the root cause is found and eliminated. The TPS house is built on production levelling (*heijunka*) (necessary for creating flow and making *kanbans* work), standardised processes (necessary to create continuous improvements) and visual management. At the very bottom the Toyota Way philosophy is found.

"TPS is not an accumulation of tools, but more a concept or method. Thinking Production System is a good explanation"

Mr. Miura (TMC interview, 2006)

Seeing TPS as a philosophy is very essential – it is a way of thinking and not a toolbox. Also evident from the figure above is the emphasis on the employees. Without employees with the appropriate skills TPS will not work.

The five Lean principles

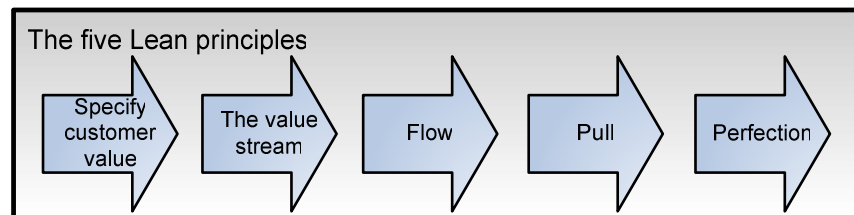


Figure 8 - The five Lean principles (adopted from Womack & Jones, 2003)

The five Lean principles (Womack & Jones, 2003) are also often referred to in connection with Lean and especially in Denmark. They are used by many companies as exact steps for a successful implementation of Lean. These principles do not capture Lean as being a system but instead promote Lean as a toolbox. In Denmark there has been a lot of focus on the value stream (VSM) with a tendency to forget the right pillar of the TPS house; jidoka (Michelsen, 2006). The five Lean principles do not capture the concept of jidoka satisfactorily.

The content

Womack & Jones (2003) say that the overarching objectives of Lean are to eliminate waste in both materials and processes and to create value as defined from the perspective of the customer (see also e.g. Phelps et al., 2004). Ohno (1988) says that the TPS is based on the absolute elimination of waste. Looking on Toyota's own homepage, TPS is described as:

"A production system that is steeped in the philosophy of the complete elimination of all waste and that imbues all aspects of production with this philosophy in pursuit of the most efficient production method"

TPS (www.toyota.co.jp/en/index.html)

As seen, the fundamental idea – elimination of waste – in Lean and TPS is the same of course since Lean is based on TPS. But in literature there is a tendency to distinguish between the two concepts – they have evolved in different directions. Bicheno (2004) argues that Lean is an extension of TPS and that it has expanded beyond TPS into areas like service, project management, construction, the public sector etc. – and that Lean continues to evolve. Michelsen (2006) supports this by saying that Lean comes from the US and TPS from Japan. Bhasin & Burcher (2006) say that the differences between TPS, as practiced by Toyota, and Lean manufacturing are significant. Two aspects pointed out are that TPS emphasizes worker development for problem solving

and spends much more time creating standardized work, which Lean seldom incorporates. This view was supported when visiting Toyota in Japan and Brussels.

Interesting though, is that Toyota is still analysed on all kinds of aspects to learn more e.g. in their work with suppliers in the US (see e.g. Liker & Choi, 2004). We also went to Japan to visit Toyota and learn more. In other words one should not underestimate the close relationship between the two concepts.

2.1.2 Toolbox or philosophy?

As discussed there has been a tendency to focus on Lean as a toolbox in Denmark (also confirmed by the participating Danish consultants) which is unfortunate. After being in Japan we realize the advantage of seeing it as a philosophy, a mindset in which the necessary tools are adapted to the situation.


<i>Case-by-case in Japan</i>	
<p>The discussion in Japan rarely concentrated on specific tools – they depended on the situation, case-by-case. The problems are solved as they show themselves, and new tools are developed to the situation if needed.</p> <p>This is not because the tools have become a natural part of business and therefore not mentioned. It is a philosophy, a way of thinking. Tools are secondary.</p>	

Figure 9 - Philosophical approach in Japan

Seeing Lean as a philosophy is also supported by literature (see e.g. Bicheno, 2004; Michelsen, 2006; Bhasin & Burcher, 2006 and James, 2005). In the book of Ohno (1988) it is said that to understand the tremendous success of TPS it is essential to understand the philosophy behind it without being sidetracked by particular aspects of the system. Furthermore, it is argued to be a management system (Ohno, 1988) – it is not just a production system.

In this connection it is relevant to draw attention to the view on Lean presented by DI since they are working to make Lean understood in the right way in Denmark. Palstrøm from DI (2006) points out that Lean is a philosophy that enables the company to create and deliver value for the customers and consumers. On their webpage (www.di.dk) they draw attention to the book *“Breaking through to flow – banish fire fighting and increase customer service”* (Glenday, 2005):

“There is a world of difference between using Lean tools in a function and being a Lean company”

Glenday (2005, p. vi (translated))

As seen from the quotation DI support that Lean is not a toolbox.

2.1.3 Lean – a cure-all?

"Success does not necessarily mean TPS. Other methods can of course be applied, and the decision is for the individual company to make"

Mr. Adams (TME interview, 2007)

At the moment most business concepts are compared to Lean, and Lean is often identified as the solution before the problem is even identified (Michelsen, 2006). A relevant question is therefore if this is true.

Papadopoulou & Özbayrak (2005) have a very interesting discussion on the subject. Different manufacturing paradigms and systems are always examined in relation to leanness because of its popularity – it is a landmark paradigm. They argue that Lean is constantly broadened creating a continuously growing universality of the philosophy – a holistic approach. New models should be viewed as complements of the already established Lean system. Bicheno (2004) supports this view saying that Lean is core. The principles are universal, and it is a question of adding other concepts to the central developing core of Lean.

Another article on the subject is *"Stepping back from Lean"* (James, 2005). Different very interesting opinions are brought out. One of them says that companies are getting used to the fact that lean manufacturing encompasses a whole range of ideas and not just one specific thing.


<i>Lean make things work</i>	
<p>Lean has been around for some time and the success keep being proved by Toyota. Lean has a solid track record and is delivering real results for companies in a huge range of industries.</p> <p>The true potential of leanness comes from its ability to sense the needs of the industry and update its content, scope and potential (Papadopoulou & Özbayrak, 2005) – companies care about making things work (James, 2005).</p>	

Figure 10 - Lean make things work

Michelsen (2006) argues that the elements of Lean have been around many years before the word Lean was used and says that Lean should not be seen as the answer before the question is known. Companies should develop their own concept with their specific problem as a starting point.

Our opinion

A new thing about Lean is the overview created of the different concepts and tools – the whole company is included. It becomes usable.

Since it is argued to take a holistic approach towards Lean – putting different concepts together under the umbrella of Lean – we think that Lean is the answer for many different companies with different problems.

Lean has proved its success, and for this reason we believe it will be a concept that will be used in the future also. It is under constant evolvment and a never ending journey for the companies using the philosophy.



Figure 11 - Our own opinion towards Lean

If the goal of Lean is an effective production system, a question of becoming world-class, then Lean is in fact the cure-all in many ways (Michelsen, 2006).

“The desire by the customer for the best product of exactly the right specification supplied in the least time at the lowest cost is universal” – Womack & Jones, 2003, p.281

“Lean is not about imitating the tools used by Toyota in a particular manufacturing process. Lean is about developing principles that are right for your organization and diligently practicing them to achieve high performance that continue to add value to customers and society. This, of course, means being competitive and profitable” – Liker, 2004, p.41

“It is about realizing the reality and then adopting an appropriate method. what should also be realized is that it takes time to make people understand what it is all about” – Professor Kimura (2006)

Lean should never be the goal itself. It is about realizing the reality and then applying the right concept – not the other way around. Ohno (1988) also claims that TPS represents a concept in management that will work for any type of business, and Toyota themselves continually adapts its culture to the local conditions (Liker, 2004). Just remember that transitional problems will be different in different places (Womack & Jones, 2003).

Toyota has a very precise way of saying it:



Figure 12 - Good thinking - good products (Toyota museum in Nagoya, Japan)

We are very impressed by Toyota’s ability to control and manage their business in every aspect. Think in the right way and become better every day is something every company can learn from.

2.2 Lean critique

Lean has of course also received quite a lot of critique. Ohno (1988), though, says that criticism is insufficient understanding of what the system is all about (also supported in the article by James, 2005).

A main source in the discussion is the article by Mehri (2006) written by an American-born computer simulation engineer who worked in a Toyota group company for three years.

“However, as time progressed and my experience deepened, I realized how easy it was to misperceive how the Toyota Way was implemented in the workplace. The reality turned out to be far from reality”

Mehri (2006, p.31)

Mehri (2006) draws attention to the fact that western observers of TPS have often missed fundamental elements because they are hidden by the nature of Japanese social and cultural norms. This causes critical details to be missed in assessing how work is accomplished as well as how work life for the average employees is characterized (Mehri, 2006).

Mehri considers the true impact of Lean work to be the human cost. He believes that the international enthusiasm for TPS results from western observers’ failure to discern the *honne* (what you actually feel or do) with the *tatemae* (what you are supposed to feel or do) which is fundamental for Japanese culture. TPS is criticized on a number of areas including limited potential for creativity and innovation (the area of innovation is also pointed out by Lamming, 1996), dangerous conditions of the production line, accident cover-ups, excessive overtime, and poor quality of life for workers. He thinks that the term “group” is more accurate than “team” for how people are working since the communication is bad, and there is no sharing of information. Furthermore, *kaizen* activities are criticized in connection with safety improvements – he says that the outcome is often very useless (Mehri, 2006).

As Mehri himself points out this is in conflict with what most literature in Lean says. The conclusions are quite interesting since they are not often heard, and they are complete contrary to the general view of Lean, and the impressions we got ourselves

from Japan. Toyota's work is appreciated throughout the world. Liker & Choi (2004) draws attention to a study (in the US) in which suppliers rated Toyota among the best at promoting innovation with vendors. The visit at TME confirmed the things learned from Japan – and from people with the same cultural background as ourselves. Thereby not saying that Mehri is wrong.

2.2.1 Debate in Denmark

At the moment the debate in Denmark is pointing out some of the same things about Lean that Mehri (2006) does. The article in *Morgenavisen Jyllands-Posten* (Møbjerg, 2007) points out that Lean creates stressed employees and hinders the creativity – especially because of the view of standardization.

There seems to be a lesson to learn since the critique is dealing with the same subjects. But this does not mean that Lean is useless which is also pointed out in the article (Møbjerg, 2007). It just has to be examined closer, and be taken into account when thinking of implementing Lean.

A discussion on the area is good but it has to be done scientifically – statements from experts on what they believe is not enough as Per Langa Jensen points out in the article (Møbjerg, 2007).

2.3 Our own definition of Lean

As discussed Lean and TPS is not the same. The foundation is differently because TPS is more about seeing the fact, study and understand the process before applying any tools. Furthermore, standardisation and the focus on people are different. We believe that these elements should be essential in Lean.

It is essential to view Lean as a philosophy and not simply as a toolbox or techniques. Lean is not a fixed concept and there is not *one* way to apply it. It is a way of thinking and solving problems applying relevant tools and techniques depending on the reality faced by the company. The elements emphasised by both Lean and TPS – cost reduction, eliminating waste, delivering value to the customer and becoming better – are essential. Furthermore, the entire organization must be involved and especially the commitment from top management is important.

Our definition of Lean is as follows:

"The objectives of lean are to eliminate waste through the entire supply chain, to create continuous improvements and to create value as defined from the perspective of the customer. This must be achieved through the involvement of the entire organization, by studying and understanding the reality and by having respect for people"

This definition will be used throughout the project. The analytical approach will be to analyse strategic alliances and supplier associations in the framework of Lean.

Part 3 ANALYSIS OF LEAN IN DENMARK

Part three gathers the information collected from the participating Danish companies. Conclusions made here will determine the focus of the project.

In order to make the project dynamic and adjust the project scope to the current development level of Lean within Danish industry, eight companies are participating in the master thesis. In this way current problems are identified which result in different relevant research areas for further analysis in Japan. It has been our intention to get an impression of what might be the next step in the development of Lean within Danish companies.

CONTENT

- 3.1 INTRODUCTION
 - 3.2 METHOD
 - 3.3 LEVEL OF LEAN DEVELOPMENT
 - 3.4 PART CONCLUSION
-

3.1 Introduction

No sensitive/confidential information has been included because it is our intention to make the project available to all interested. Only general issues are of interest since we are not dealing with a specific problem for a specific company. This of course also implies that some of the participating companies may have slightly different approaches/problems than the ones pointed out here since generalizations have been made based on the findings.

Detailed information about the individual company is not of much relevance and for this reason only short company profiles have been made. These can be found in appendix D together with a detailed summary of the meetings.

3.2 Method

The project deals with eight different companies including the Danish Confederation of Danish Industries (DI). The main concern has been to find companies representing different stages in the supply chain and to a less extent the level of development within Lean. In this way problems are identified beyond the focal company which is the focus of the project. The participating companies and their representation in the supply chain can be seen from the following figure (DI is not included because it is a federation):

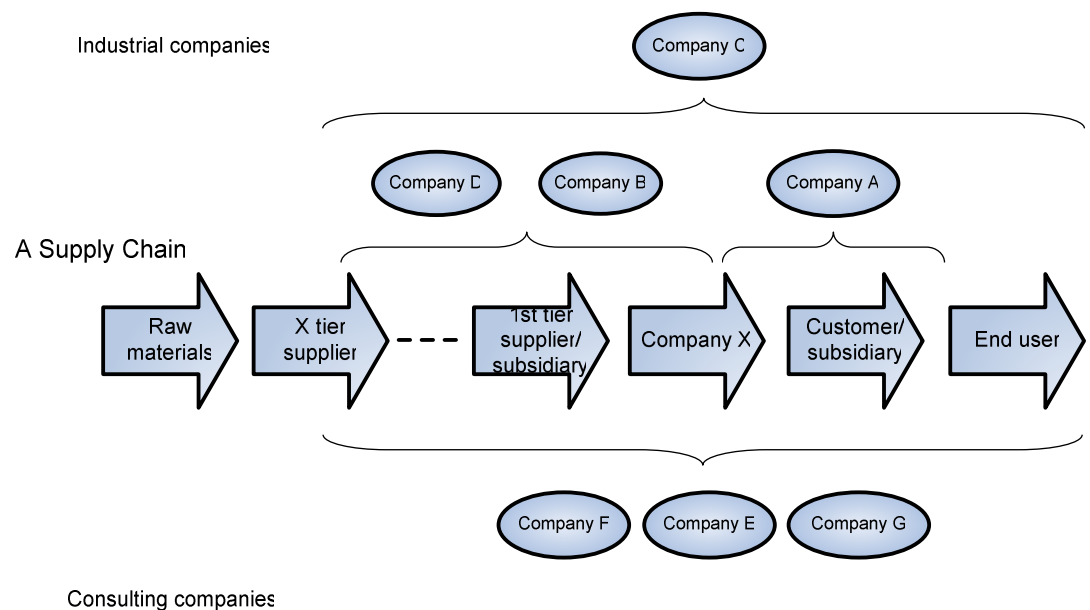


Figure 13 - Danish companies representing different parts of the supply chain

The consultant companies have been chosen in order to get a general overview since they work with many different companies in relation to Lean. This would have been difficult to gain from only industrial companies and would have required more companies to participate. DI has also been chosen for this reason. DI currently consists of 6600 members within manufacturing and service industries. Their mission is to provide the best working conditions for the Danish industry in order to improve the competitive edge (www.DI.dk). They provide very useful insight into the general level of development within Lean. Despite the fact that only a limited number of companies are participating, we believe that the findings give a good indication of the problems facing Danish companies and what stage of development they are on regarding Lean. Furthermore, it can be pointed out whether the problems occurring depends on time spend working with Lean.

3.2.1 Data collection

A brochure was sent to the participating companies to outline the project, and give an idea of the content of the subsequent meeting.



Figure 14 - Brochure sent to the Danish companies

Meetings were held in the period from June 2006 until August 2006 and consisted of a more clarifying presentation (see appendix B) of the project and a following general discussion concerning experiences, problems etc. from their work with Lean. The length of each meeting was around one to two hours. In order to lay down guidelines for the meeting, questions were provided beforehand:

Questions provided beforehand

- **What is your general Lean progress?**
- **What is new in Lean as you see it?**
- **What problems have you encountered in your work with Lean**
 - **Of special interest is problems in connection with the process of dif-fusing Lean into the supply chain**
- **How is the improvements shared equally between the involved parties?**
 - **Has it been a problem?**
- **What should you be aware of regarding Lean?**
 - **What are the critical factors/areas?**
- **What tools/methods have been good/bad in the work with Lean?**
- **Why do you find our project interesting?**
 - **Where should focus be put if you were to decide?**

Figure 15 - Questions for the participating companies

We have used the same set of questions for all involved companies but of course the angle of the discussion depended on the specific type of company in question.

3.3 Level of Lean development

According to Thomsen & Munkesø (2005) and Jørgensen & Knage-Rasmussen (2005) the focus in 2004 was on the individual company and on the internal barriers. The philosophy was gaining recognition especially as a mean to reduce the overall costs but it was mainly seen as a rationalization tool and the diffusion in the Danish Industry was generally limited. It was mostly in the nature of pilot projects concerning specific departments or products and focused on a reduced amount of the elements and tools in Lean. With great emphasis on value stream mapping (VSM) the companies were mainly “cherry picking” from the Lean philosophy and both master theses conclude that in 2004 the Danish companies did not achieve the full benefits of Lean.

The main pitfalls pointed out were the cultural difference between Denmark and Japan, the change management associated with converting the company to become Lean and the management commitment.

It can be discussed whether the breakthrough of Lean in Denmark happened in 2003 or 2000/2001 (Jørgensen & Knage-Rasmussen, 2005). Anyhow, the Lean philosophy is getting a great amount of attention in Denmark and the consultant companies are helping many companies in their work with Lean.

In the following the analysis has been divided according to the classification of the participating companies.

3.3.1 Industrial companies

The four industrial companies have worked with Lean over different periods of time. Inspired from Womack & Jones (2003) and Thomsen & Munkesø (2005) a company can evolve through different stages of Lean – see the following figure. When it comes to industrial companies, Lean is often started in the manufacturing, evolving to the entire company and then on to suppliers, customers etc. creating the Lean enterprise.

This figure has been used to characterize the Danish industrial companies as we see it.

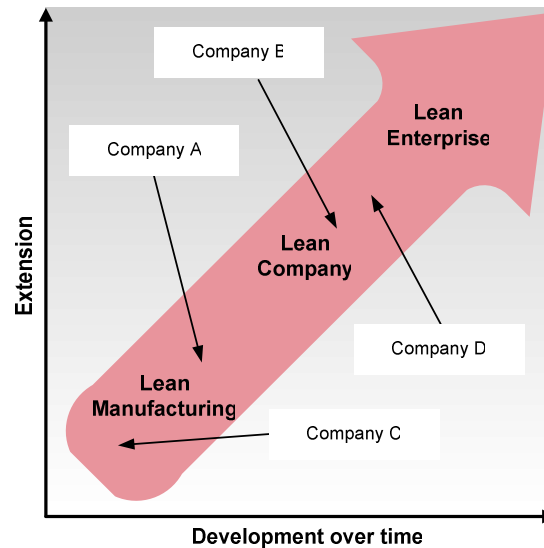


Figure 16 - The companies' development level

As the figure shows, the companies are wide spread with Company C and Company D in each end. One must be aware of the complexity of the figure. For instance Company A, who is located just above the Lean manufacturing level, is working with Lean both in their production and at their suppliers. This does not mean that they are heading for the Lean enterprise level but on the other hand one cannot place the company in the lower left corner. In fact neither of the companies is focusing entirely on the manufacturing level or the company level. It is a mix and a result of where the biggest economical potential is located.

The supply chain and partnerships

Company B and Company D are the companies in front in terms of focus on the supply chain with the latter in front. This explains their placement in the figure. Actually, Company D can be thought of as one of the pioneers within supply chain management in Denmark (they received the Danish supply chain price in 2005 given out by Post Danmark (www.post.dk)). They have knowledge about outsourcing and close collaboration with their suppliers. Furthermore, they have been concentrating on the supplier relationship a couple of years now but just recently found out how to handle it. That the other participating companies are not as far, does not mean that close partnerships are not considered:

"There is nothing to prevent close relationships with suppliers – it is a matter of creating the necessary focus"

Company A (Company A interview, 2006)

Through experience Company D has learned that it is not favourable to work closely with all suppliers. Focus should be put on the strategic important suppliers as the figure underneath shows:

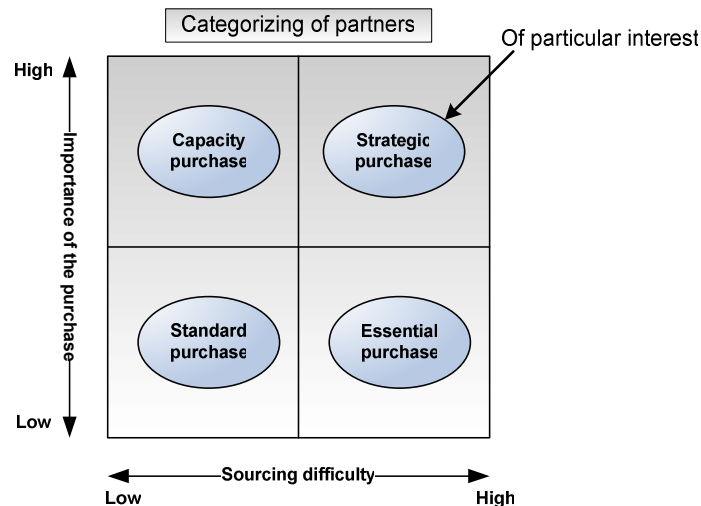


Figure 17 - The sourcing model of Company D (Company D interview, 2007)

Another issue when talking partnerships is how to realize and distribute the profit and the advantages. Company D's approach is to split the profit equally among the company and its partners. Others, though, think that it should be split in proportion to the company size and its input showing that it is a difficult area.

From discussions with the other companies it also became evident that partnerships are often based on selfishly suppositions on what is best for the single company or department and not on what is best for the supply chain in general. It is often a question of forcing a supplier to act in a certain way not thinking too much about the supplier.

Main problems

The main problems from the interviewed companies reflect organizational difficulties and how to approach the implementation. Furthermore the topic of alliances is mentioned. The interest regarding the alliances is gathered around the companies in which a larger part of the product value is added outside the company.

3.3.2 Consultant companies

The supply chain

It is pointed out by the consultant companies that the Danish companies in general have come a long way during the last 2-3 years, but they have also realized that it is hard to implement. Lean is worked with on many different levels, and they claim to be good at it even though only fractions of Lean are implemented. The companies often find them selves in another situation than the one stated in the books.

Many companies have started to diffuse Lean from single departments into the whole company but conflicts between different departments within the company are creating limitations. They often work towards conflicting goals – e.g. purchased amount vs. stock level. One reason for this is the different measurements used to report progress of work in the different departments. It is necessary to take it to the next level beyond internal boundaries to gain the full benefits. But this is very difficult partly because the responsibility is placed different places in the company.

Suppliers and customers are also starting to be considered, but the experiences are limited and only a few have actually started the progress towards the Lean enterprise. Conflicts become even more challenging in this context and no tangible guidelines exist. There are in other words a lot to be learned in this area.

Use of the five Lean principles

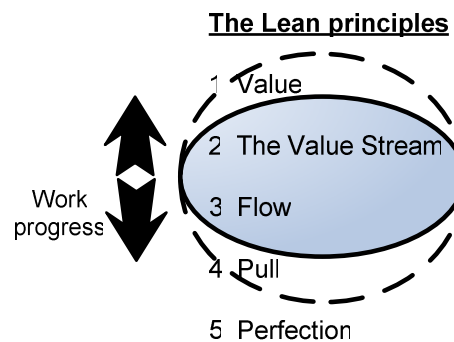


Figure 18 - The progress of Danish companies regarding the five Lean principles

One of the consultant companies described the progress of Lean in Denmark by using the five Lean principles (Womack & Jones, 2003) – see the figure above. The work concerning the value stream and flow is done with great success while defining value is too often neglected – but it is improving. With regards to the fourth principle, pull, a lot of work is put into it, but the fundamental things in e.g. the production model are not questioned. That is, rethinking is often necessary but not carried out. Furthermore, a long lead time makes pull difficult and necessitates push to some extent. Progress has not yet reached the last step, perfection.

Management

No matter what type of company or level of development with regards to Lean, management is pointed out as one of the main success factors for Lean to work – their commitment is very essential. Furthermore, the importance of involving everybody in the organization is pointed out because the employees have to drive the changes if it is going to work in the long term. Change management is very important and difficult.

3.3.3 The Federation of Danish Industries (DI)

DI is working with Lean arranging seminars and training sessions for interested parties and hereby trying to diffuse the principles of Lean to the Danish companies.

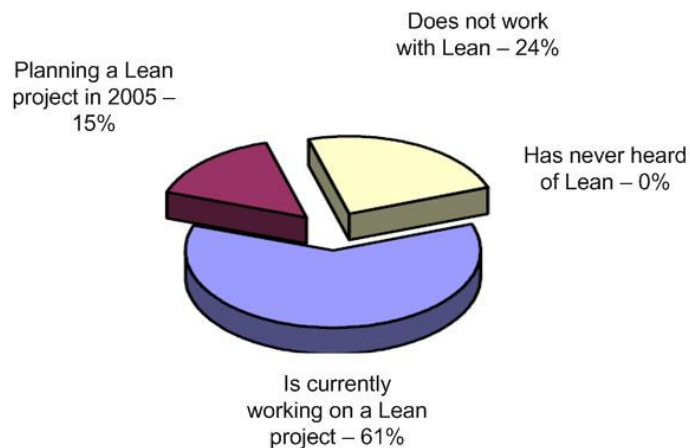


Figure 19 - Diffusion of Lean in Denmark - adopted from DI (DI, 2005)

The Lean philosophy is very spread out in Denmark as seen from the figure above. Three out of four companies are working with Lean and Denmark has the highest number of copies of the book “Learning to See” per inhabitant (www.di.dk).

But the Danish companies are working with Lean on many different levels. Some companies are using Lean as a headline on a traditional improvement project not understanding what Lean is really all about and therefore not grasping the real benefits. On the other hand the survey by DI (DI, 2005) also shows that the message of Lean and the fundamentals have been understood by the companies. In this way the companies have come a long way and a lot of effort is being put into the work with Lean.

Most companies see Lean as means to reduce costs, increase the productivity, secure a better utilization of existing equipment and increase flexibility. But at the same time only a few see Lean as means to create growth and new products or services, which again creates a blurred picture of Lean.

In terms of essential tools of Lean, the Danish companies are doing a good job (see e.g. Bicheno, 2004 for tools) which creates a good foundation for the work with Lean. Delegation of decisions and competences to the employees and the use of 5S and Kaizen are the most popular tools. Many basic Lean tools have been used for a longer period with success and there is a good tradition for cooperation between employees and the management in Denmark (DI, 2005). Furthermore, many companies are working to create a culture based on continuous improvements. But the company culture is also pointed out to be a barrier since it is very difficult to change and requires great commitment from the management.

Pitfalls

The pitfalls pointed out are first of all related to management. The lack of enough time and management resources hinders the development of Lean and creates implementation problems (DI, 2005). People react differently to changes creating problems not necessarily directly related to Lean but also the change management in general. The pitfalls pointed out by Palstrøm (2006) are listed in the table below (see also Center For Ledelse, 2006 which include a survey of Lean thinking in Danish companies).

<i>Pitfalls in relation to Lean</i>	<i>Other pitfalls</i>
<ul style="list-style-type: none"> • Overspecialised, repeated work • Experimenting culture can create stress • Standards vs. creativity 	<ul style="list-style-type: none"> • The motive to begin with Lean • The purpose of Lean is misunderstood • Anchoring in top management • Outsourcing of the job of introducing Lean • Underestimate the implementation process • Adjustment of politics, systems and organisation

Figure 20 - Pitfalls in relation to Lean (Palstrøm, 2006)

Criticism of Lean includes comments on the lack of innovation and creativity and creating a stressful environment (see also e.g. Papadopoulou & Özbayrak, 2004 and Mehri, 2006). This is not the intensions of Lean but nevertheless, attention on possible pitfalls increases the likelihood on overcoming them, e.g. through handling stress and explaining that standards are not static but evolving over time as things are improved (Palstrøm, 2006). But standards are viewed negatively in Denmark:

"Standardization is in conflict with the fact that employees are given the power to work independently in teams"

Company D (Company D interview, 2006)

With regards to the other pitfalls it is very important that Lean is deeply rooted in the entire organization and connected to the vision, values and strategy of the company. Management needs to lead the way and explain what it is all about since it is a new way of doing things. This also implies that the necessary resources need to be put aside, behaviour needs to be changed all causing the implementation to be difficult. In order to gain the full benefits, adoption to the new Lean behaviour is needed. (Palstrøm, 2006 and www.di.dk).

3.3.4 Perception of Lean

One of the questions during the discussion with the different companies concerned the perception of what is new in Lean. Different statements were given, and it is quite interesting to see how much it actually differs:

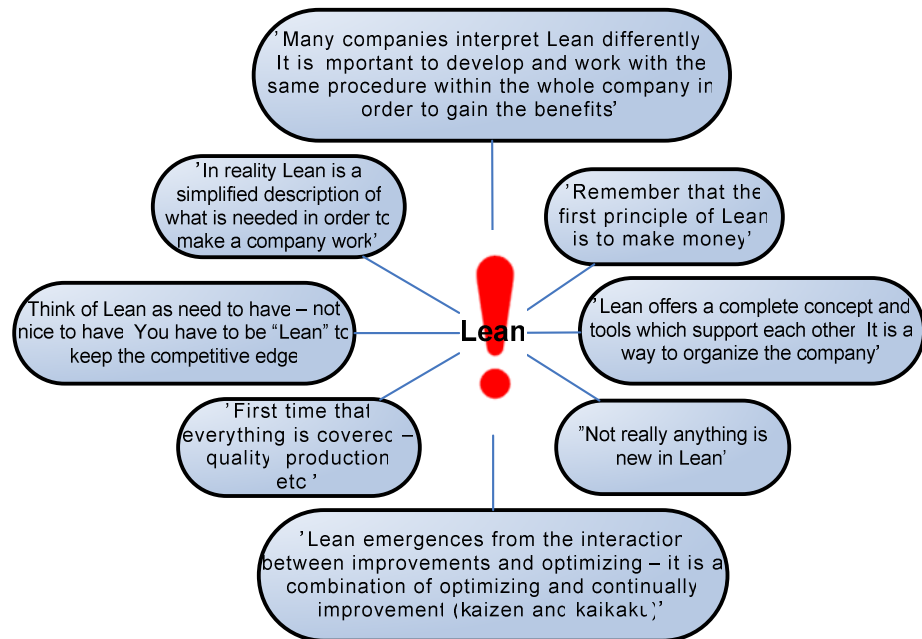


Figure 21 - Different perceptions of Lean

The spectrum of views covers everything from “*nothing is new*” to “*Lean is what it takes to make a company work*”, which is rather interesting. Two of the companies both emphasized that it is a question of what is developed within the company – a certain way of working with Lean is applied. The important thing is then to spread out the same perspective across the entire enterprise (Danish interviews, 2006).

The statements of course depend on how long time Lean has been a part of the company’s way of working. Many of the comments are characterized by a good understanding of Lean and show that the development is quite far. But it is hard to make generalizations since the picture given by the companies are very diverse. One thing is sure though; no common perception of Lean exists.

3.4 Part conclusion

There is a lot of focus on Lean in Denmark and the development of Lean is going fast. Many companies have come a long way and gained a lot of benefits, while others are still just thinking of starting their journey. Hence, it is hard to say something that covers the whole Danish industry.

Compared to the survey made by Jørgensen & Knage-Rasmussen (2005) and Thomsen & Munkesø (2005) it is obvious, that the Danish companies have experienced some kind of development during the last two years. The common understanding of Lean among the larger companies in Denmark has changed from means of rationalization towards a more philosophical view, making the progress towards the Lean enterprise possible. Still though, there is a lot of emphasis on Lean as a toolbox to be used under certain circumstances.

The identified problems depend on the Lean development within the company, where value is added in the supply, chain and to a smaller extend on the industry in which

the individual company is placed. This implies that the stage of “Lean company” is not necessarily completed before the supply chain is included, and the journey towards “Lean enterprise” has started.

Working with Lean is hard, and it takes time and resources. Jørgensen & Knage-Rasmussen (2005) concluded that the next step for the Danish companies was the diffusion of Lean to the entire supply chain in order to gain the full benefits. It is interesting to see that two years later this is still the case – no company has taken the step yet. Furthermore, there seems to exist some universal problems; management commitment, involving of the entire organization and change management. This was pointed out by all the companies regardless of the level of development or placement in the supply chain. Also, this was pointed out by the companies surveyed by Thomsen & Munkesø (2005) and Jørgensen & Knage-Rasmussen (2005). This is fundamental to the success of Lean and not easy to solve.

Overall the sphere of the problems seems to have moved towards the company/enterprise level. Lean has been broadened to include more than a single department or product, and the work towards suppliers and customers has begun, but only few guidelines about how to do this exist.

3.4.1 Identified Problems

Based on the information collected from the Danish companies a number of problems have been identified. Not all companies were mentioning the same points; though, it is possible to gather these in some common categories. To keep it simple, it is chosen to divide the identified problem into four sub areas which appears in the figure below:

<i>Area</i>	<i>Identified problems</i>
Organizing	<ul style="list-style-type: none"> • Process vs. functional departments • How to involve everyone in the organisation • Prioritizes of the purchaser • Commitment from the top-level managers • How to insure successful implementation
Supply chain coordination	<ul style="list-style-type: none"> • Ensuring how to work towards the same goals • Organizing and communication between companies • Extended Value Stream Mapping (VSM) • Who is responsible for the coordination – where is it placed?
Strategic dilemmas	<ul style="list-style-type: none"> • E.g. lead time vs. stock-level and control vs. initiative • How to benefit from the gained benefits for a company as a whole
Partnerships	<ul style="list-style-type: none"> • Sharing and distribution of the achieved benefits • Creation of new partnerships • Who negotiates the logistic part in a new sales deal • Investment vs. profit

Figure 22 - Identified problems from the participating Danish companies

The aim of this thesis among others is to come up with a methodology to address the problems and furthermore, it should be usable for all of the involved companies. For the purpose of this master thesis, focus has been chosen to be partnerships, and the following needed supply chain coordination, because it seems like these areas are very relevant for the participating Danish companies.

Part 4 THEORY

Part four outlines the theory concerning strategic alliances and supplier associations in a Lean supply chain.

In order to put the investigation of Japanese companies into perspective, theory is investigated. In this way it is possible to complement the investigation made in Japan.

CONTENT

- 4.1 INTRODUCTION
 - 4.2 LEAN SUPPLY CHAIN
 - 4.3 STRATEGIC ALLIANCES
 - 4.4 SUPPLIER ASSOCIATIONS
 - 4.5 KEIRETSU
 - 4.6 BEST PRACTICES
 - 4.7 THE ROLE OF SMEs
 - 4.8 PART CONCLUSION
-

4.1 Introduction

Strategic alliances and supplier associations are set in the big picture of the Lean supply chain. These areas will be defined in the following. The Japanese term *keiretsu* will be dealt with because of its relevance in connection with supplier relationships. Furthermore, the role of SMEs will be mentioned because Danish industry is made up of these (Martin & Olds, 2004).

The literature is not straight forward since strategic alliances in particular have not been dealt with much in the context of a Lean supply chain. Therefore different areas have been examined and put together, and a number of best practices have been studied to learn more. Regrettably it has not been possible to dick into every area. Rather, the purpose has been to outline different theories to cover as many aspects as possible, and to draw attention to the relevant issues. Time has therefore limited the research but we believe that this approach creates a more practicable report, and hope it will be used in different contexts as a work of reference

In choosing literature focus has been put on the latest. Especially, articles have been a source to the newest information.

4.2 Lean supply chain

When talking about the Lean enterprise, it is interesting to see that it is mentioned already in 1991 in *The machine that changed the world* (Womack et al., 1991) and further elaborated in 1994 (Womack and Jones, 1994). Still in 2003 when mentioned in *Lean thinking* (Womack and Jones, 2003), it is pointed out that no one has yet taken the *full* step towards the Lean enterprise – Toyota is also constantly evolving. It draws attention to the fact that it takes time and many trial-and-errors to create a Lean enterprise.

The subject has really been brought into focus the last couple of years. Companies are expanding the Lean concept from the internal to the external view. In this context we will only draw up the Lean enterprise and do not discuss the details. Focus is more on strategic alliances and supplier associations, but the Lean enterprise is what ties it all together.

Definition

Womack & Jones (1994) envisions the lean enterprise as “*a group of individuals, functions, and legally separate but operationally synchronized companies*” (p. 93) and further points out, that the Lean enterprise is different from keiretsu in Japan in that members in a lean enterprise are free to leave if collaborators fail to improve their performance or refuse to reveal their situation.

In literature it seems that two terms are used; Lean supply chain management and Lean enterprise. Womack & Jones (1996) say that the organizational mechanism for defining value and identifying the value stream from concept to launch, order to delivery, and raw materials to finished product is the lean enterprise. The objective is to correctly specify value for the customer, avoiding the normal tendency for each firm

along the stream to define value differently to favour its own role in providing it (Womack & Jones, 2003 – see them for an analysis of its features). Papadopoulou & Özbayrak (2005, p. 796) have brought a definition; *“A Lean enterprise is a business organization that delivers value to its stakeholders, with little or no superfluous consumption of resources”*. (See also Karlsson & Åhlström, 1997 and MacInnes, 2002 on the characteristics of Lean enterprise).

Turning to the area of Lean supply chain management it is defined by Vitasek et al., (2005 p. 40 – see also Reeve (2002, p.42) for a definition) as *“a set or organizations directly linked by upstream and downstream flows of products, services, finances, and information that collaboratively work to reduce cost and waste by efficiently pulling what is needed to meet the needs of the individual customer”*.

Both terms are centred on bringing the right product to the customer at the least amount of costs. A difference though, seems to be the starting point. Lean enterprise is centred on a focal company whereas Lean supply chain management is broader. But in reality it is about the same thing, and in this context things from both concepts will be taken. We will refer to Lean supply chain throughout this project.

4.2.1 Characteristics

It is interesting to see what makes a supply chain *Lean*. A definition of supply chain management is *“management of integrated business processes across the supply chain towards the end customer”* (translated from Lythcke-Jørgensen et al., 2001 p. 16). The difference from Lean supply chain management seems to be the focus on elimination of waste and cost reduction. Lamming (1996) deals with the subject on squaring Lean supply with supply chain management. The fundamental principle of Lean supply is that the effects of costs associated with less than perfect execution of a sub-process are not limited to the location of the execution and further, Lean supply does not recognize the traditional positions of customer and supplier, which tend to obscure the central quest for the removal of waste.

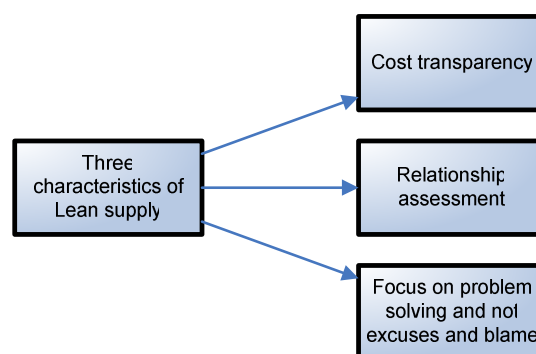


Figure 23 - Three characteristics of Lean supply (adopted from Lamming, 1996)

As can be seen from the figure above, Lamming (1996) points out three characteristics of Lean supply. In terms of cost transparency it is necessary that customers and suppliers share process information, including cost data, and also accept that all players can influence each other. It is also pointed out that relationship assessment pro-

grammes (RAP) are necessary agreeing that both the customer and supplier have equally important views on the development. This area is also dealt with by Lamming et al. (1996), where it is pointed out that the connection between the assessment criteria and the stage in the relationship's development is vital.

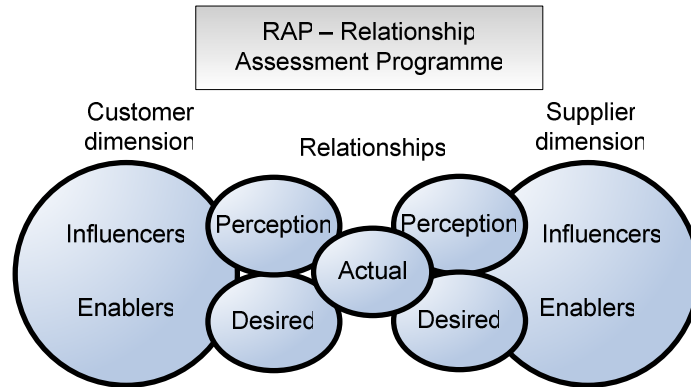


Figure 24 - RAP Model (Lamming et al., 1996 fig. 2)

The RAP model (see the figure above) is based upon the fact that there is often a missing understanding of what is actually going on between partners and of what is expected from the individual partner. A clearer understanding is developed through the RAP Model identifying who influences and controls the relationship and identifying mismatches between the desired and the actual state of the relationship. It is brought here because it is important to understand what is actually going on in a relationship between two companies (for further details on the model and on the enablers and influencers see Lamming et al., 1996).

The last point in the figure on characteristics of Lean supply – excuses and blame – is that problems are target for solutions and not blame in Lean supply. Lamming (1996) ends up concluding that the precepts of vantage point (usually occupied by the firm doing the last significant transformation of the product) and customer superiority central to supply chain management are directly contrary to those of Lean supply. Here Womack & Jones (2003) claims that the Lean enterprise needs a leader which is often the firm bringing all the components into a final product – but also that participants must treat each other equal. It is, in other words, important to work together.

Two more views are presented here on the characteristics. The first one is from Vitašek et al. (2005). The figure below shows what makes a Lean supply chain:

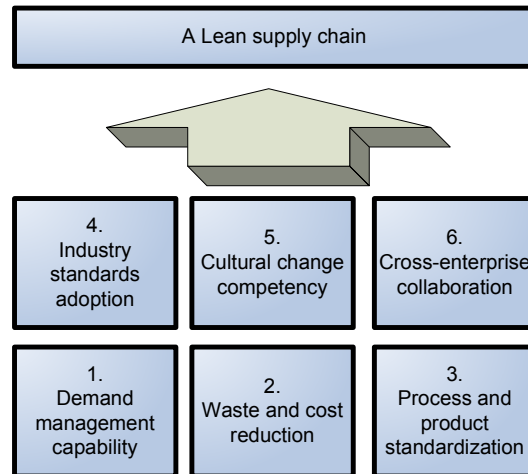


Figure 25 - What makes a Lean supply chain (Adopted from Vitasek et al. (2005))

The first thing to point out here is the waste and cost reduction. The focus is on waste and not cost since eliminating this implies reduction in cost, and it makes the conversation with customers and suppliers less threatening. In this way supply chain partners can work together to modify policies, procedures and data-collecting procedures that produce or encourage waste. Continuous flow is enabled through process and product standardization, which also requires a value stream perspective. It is necessary to integrate activities across suppliers, through the organization on to the customers (for more details on mapping the extended value stream see Jones & Womack, 2003 and Bicheno, 2004). An understanding of the supply chain helps the partners standardize important processes and identify where it is most efficient to allocate resources. As with any other major change management initiative, the transition must have the unconditional support from the top management since the cultural changes is one of the biggest challenges. Furthermore, it is crucial that the people are viewed as valued assets in the process, which was also confirmed at Toyota (TMC interview, 2006). With regards to the last point – cross-enterprise collaboration – it should be pointed out that cross-enterprise teams are a major enabler of supply chain collaboration but at the same time also very difficult to carry out in practice. The teams should be focused towards the whole supply chain and have members from all supply chain partner companies. Of course all the areas in the above figure are what make a Lean supply chain, but a good starting point is the demand management capability – an area where Toyota is very good (TMC interview, 2006).

The second view is from Milgate (2001):

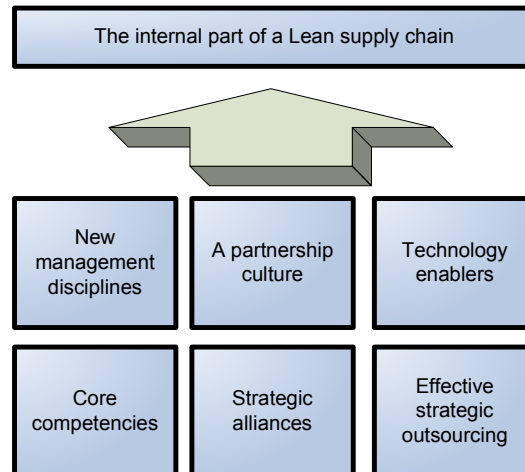


Figure 26 - Six building blocks for the Lean organization (Adopted from Milgate, 2001)

This view is more internally focused, but is still brought here because the enablers are also directed towards the external supply chain. Milgate (2001) has many good points of which only a few will be mentioned here. First of all it is evident that strategic alliances and a partnership culture play a significant role in becoming a Lean organization. In this context it is pointed out that a rigid command and control hierarchy is not the way to engage other organizations in alliances and create effective teamwork within it (Milgate, 2001). There are few answers to partnership models but a good starting point is Gore's concept; no one has fixed or assigned authority, sponsors rather than bosses guide teams, "fellowship" replaces leadership, people communicate directly with one another rather than through hierarchies, people set their own objectives – then make them happen and tasks and functions are organized through commitments (Milgate, 2001). It is also critical to determine how high-performance business teams crossing company boundaries can be created.

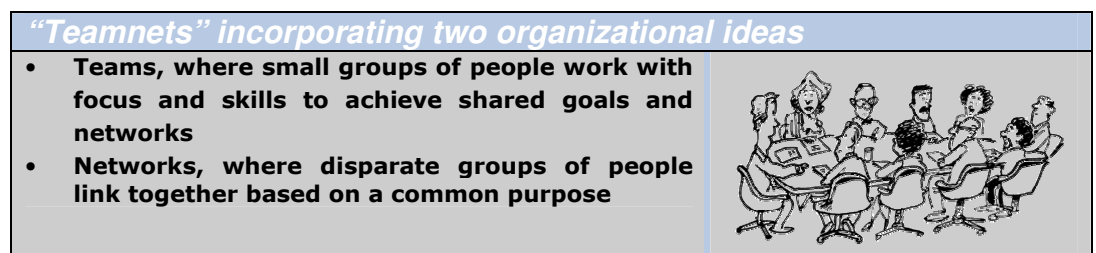


Figure 27 - "Teamnets" (Milgate, 2001)

The principles that tie a teamnet together are the unifying purpose, independent members, voluntary links, multiple leaders and interactive levels. The idea is that people work together in high performing teams at every level and the network as a whole functions as though it were a highly skilled and motivated team (for more details see Milgate, 2001).

Technological fit

Technological fit between partners in an alliance is very important since communication and information exchange are facilitated. The most appropriate technological enablers and the kind of information used will depend on the nature of the alliance (Milgate, 2001). Stuart (1996) says that the perceived value of information depends on the

process structure, the type of problem and the degree of difference between the firms. Furthermore, there are three types of information passed between alliance partners; planning information, performance feedback and technological assistance. All in all, it is important to be aware of the role of information especially because too much information can also be bad (see e.g. Liker & Choi, 2004 and Vitasek et al. 2005).

Management disciplines

There are three critical business-process areas for managers in a portfolio of relationships – see the following figure:

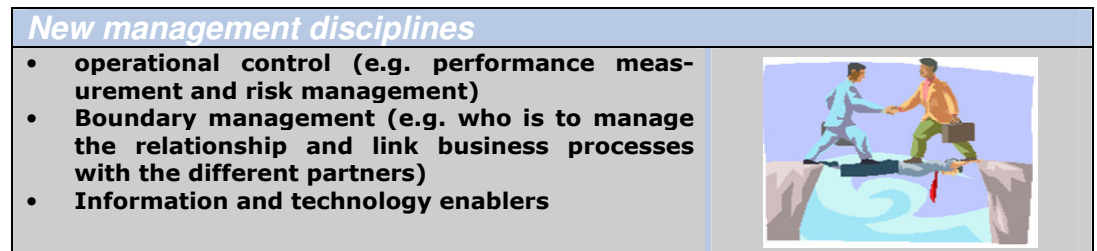


Figure 28 - New management disciplines (Milgate, 2001)

Furthermore, managers work as “brokers” operating across hierarchies rather than within assembling from both own organization and from outside sources (Milgate, 2001). Brokers perform three important roles; architects designing the network or alliance and identifying the components needed to form it, and secondly they are leaders of an alliance network – using negotiating and persuasion rather than command and control, and lastly they are caretakers for the alliance – seeking new opportunities in which political skills are needed.

Toyota in the US

A final point in describing the characteristics of a lean supply chain is the one of Toyota in the US. This, because Toyota is often benchmarked in the area of Lean and Toyota’s way of doing things is used throughout this report. The characteristics can be seen from the following figure:

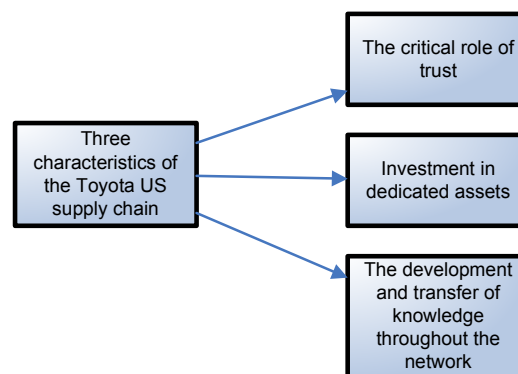


Figure 29 - Characteristics of the Toyota US supply chain (Adopted from Bicheno, 2004)

The investment in dedicated assets is possible when dealing with partnerships and more advantageous in complex industries than simple industries, where arms-length relations may be best (Bicheno, 2004). Partnerships are in other words a very important aspect of a Lean supply chain and have a critical role in carrying out the above

characteristics. Toyota themselves also say that they cannot do business without their suppliers (Ohno, 1988).

In agreement with Vitasek et al. (2005) Lean supply chain management is not a destination, but a journey – the path is not easy but it is worth it.

<i>A successful enterprise</i>
<ul style="list-style-type: none"> • Leadership from the manufacturer • Partnerships between the manufacturer and suppliers • A culture of continuous improvement • Joint learning among companies in the supplier network.

Figure 30 - A successful enterprise (adopted from Liker & Choi, 2004)

4.3 Strategic alliances

One of the trends in today's supply chains is that organizations are trying to reduce the number of suppliers and instead develop partnerships (Slack & Lewis, 2002). It is recognized in Lean supply that the effects of costs associated with bad execution of a sub-process are not limited to the actual place of execution (Lamming, 1996). Partnerships beyond the traditional positions of customer and supplier are needed in order to compete in the global market. Liker & Choi (2004) claims that partnerships are the supply chain's lifeblood, which is also supported by Slack & Lewis (2002), saying that buyer-supplier trading relationships have always been at the heart of all business. According to Killen et al. (2002) partnerships are one of the answers for making the supply chain both Lean and agile.

"Skill at finding, forgoing, and exploiting beneficial alliances as a route to building world-class organizational performance, will be one of the most valuable of business skills and one of the most critical issues on every organization's business agenda"

Milgate (2001, p.186)

What should be kept in mind, though, is that building relationships with suppliers are tougher than companies imagine and the question is *how* to do it and not *if* (see e.g. Liker & Choi, 2004). Literature points out the big failure rate of alliances (see e.g. Dyer et al., 2001; Koza & Lewin, 2000 and Milgate, 2001) saying that strategic alliances are tough to manage.

4.3.1 Definition

In the context of this report the term *strategic alliance* will be used, but the concept of organisations working together to achieve competitive advantage has many other terms like networks, partnerships, and business cooperation (Killen *et al.*, 2002). Though, the term *partnership* will be used in some contexts when it seems naturally. Slack & Lewis (2002) says that essentially, partnerships between suppliers and customers can be viewed as strategic alliances. We support Milgate's argument about essential capturing what makes an alliance strategic and not e.g. tactical. Three objectives characterize a true strategic alliance (Milgate, 2001):

Characteristics of a strategic alliance

1. Provide extra leverage for an organization's core competencies in order to win long-term sustainable competitive advantage
2. Move an organization into long term and developing commitments to new markets, territories, or technologies that were previously closed to it
3. Provide a platform for kinds of organizational learning that are central to future business success, but would otherwise be unobtainable

Figure 31 - Three characteristics of a strategic alliance (Milgate, 2001)

Strategic alliances exist in different forms – Koza & Lewin (2000) classify them into three depending on the degree of exploration and exploitation whereas Lorange et al. (1996) uses input and output resources to come up with four different kinds. Furthermore, an alliance can involve different areas like R&D, marketing, consolidation joint ventures or new joint ventures etc. (see e.g. Dyer et al. 2001 and Koza & Lewin, 2000) which requires different things to be successful – Kotler & Keller (2006) talks about four different kinds within marketing alliances. We have chosen to focus on *strategic* alliances because of the importance of these to the business, and it has been chosen to talk about these in a uniform way, not distinguishing between different kinds. This is mainly due to focus on the general view – a procedure can quickly become too detailed losing its purpose. Also, limited time resources have been a reason since a lot of effort has been put into the fieldwork. Finally, a lot of literature talks about strategic alliances in a uniform way.

4.3.2 Characteristics

Strategic alliances are characterised by long-term and close relationships (Slack & Lewis, 2002 and Bicheno, 2004). The degree of closeness is determined by many factors:

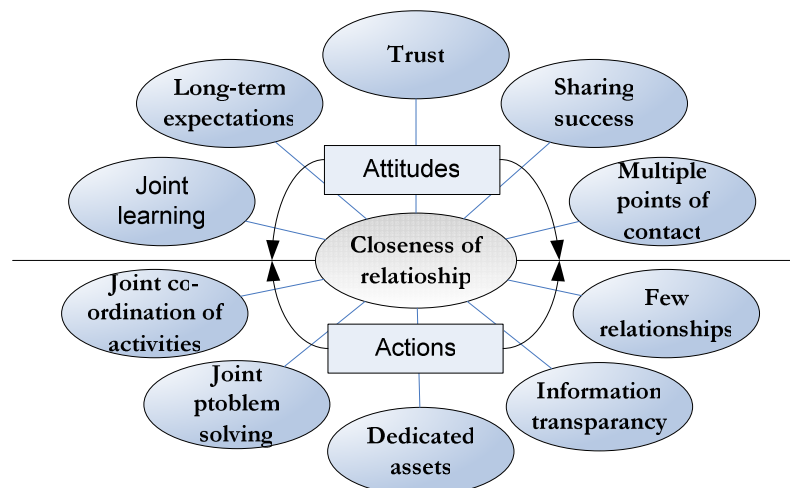


Figure 32 - Elements of partnership relations (figure from Slack & Lewis, 2002, p. 200)

Key elements include efficient information transparency, long-term expectation and trust (see also Maloni & Beneton, 2000 for factors). For both partners to be committed, sharing of the success is also very essential. The single most important element is trust (for a definition see Slack & Lewis, 2002 p.201) – it is at the heart of any understanding of partnership relations, and without it no one would be willing to take risks. Most research highlights the role of trust in determining the scope and limits to the re-

lationship (Slack & Lewis, 2002. See also Akacum & Dale, 1995 and Killen et al., 2002).

Trust is often seen as an alternative to having monitoring systems and to reduce opportunistic behaviour (Milgate, 2001). Joint problem solving is important, since the way in which problems are handled is central to how the partnership itself develops (Slack & Lewis, 2002). Strategic alliances have great potential for bringing the organization competitive advantages but it takes a great effort! Maintaining the attitudes and activities resulting in the required high level of trust is very difficult (Slack & Lewis, 2002). Personal relations play an important role, which is not an easy area.

4.3.3 Working with strategic alliances

To begin with it should be pointed out that there is not a single solution and no definite best practice (Lamming, 1996). But there are of course a number of factors that will increase the chances of succeeding in working with strategic alliances.

Of course not all suppliers are worked with in strategic alliances – it takes up too many resources (Akacum & Dale, 1995). For Lean supply to work a few or a single good and trusted supplier per part is used (Bicheno, 2004). Bicheno (2004) further suggests at least four models for supplier strategy of which only one is presented here:

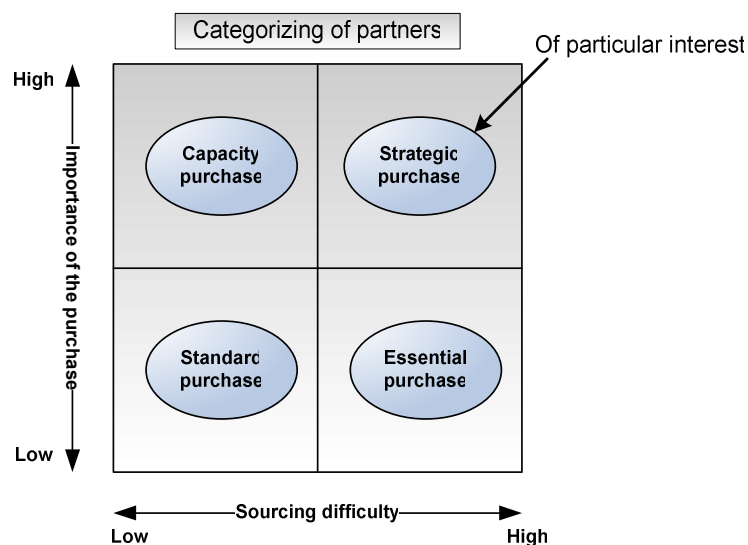


Figure 33 - Categorizing of partners (adopted from Company D and Bicheno (2004))

It is essential that resources are put into the right partners recognizing that strategic partners require more attention and management (Milgate, 2001 and Company D interview, 2006).

Stuart & McCutcheon (1996) further puts out that a specific buyer-supplier combination may not represent fertile ground for developing a strategic alliance. There are a number of prerequisites for formation of a strategic alliance which can be seen from the following figure. What can also be seen are the critical success factors for forming a strategic alliance as described by Milgate (2001) and Killen et al., (2002):

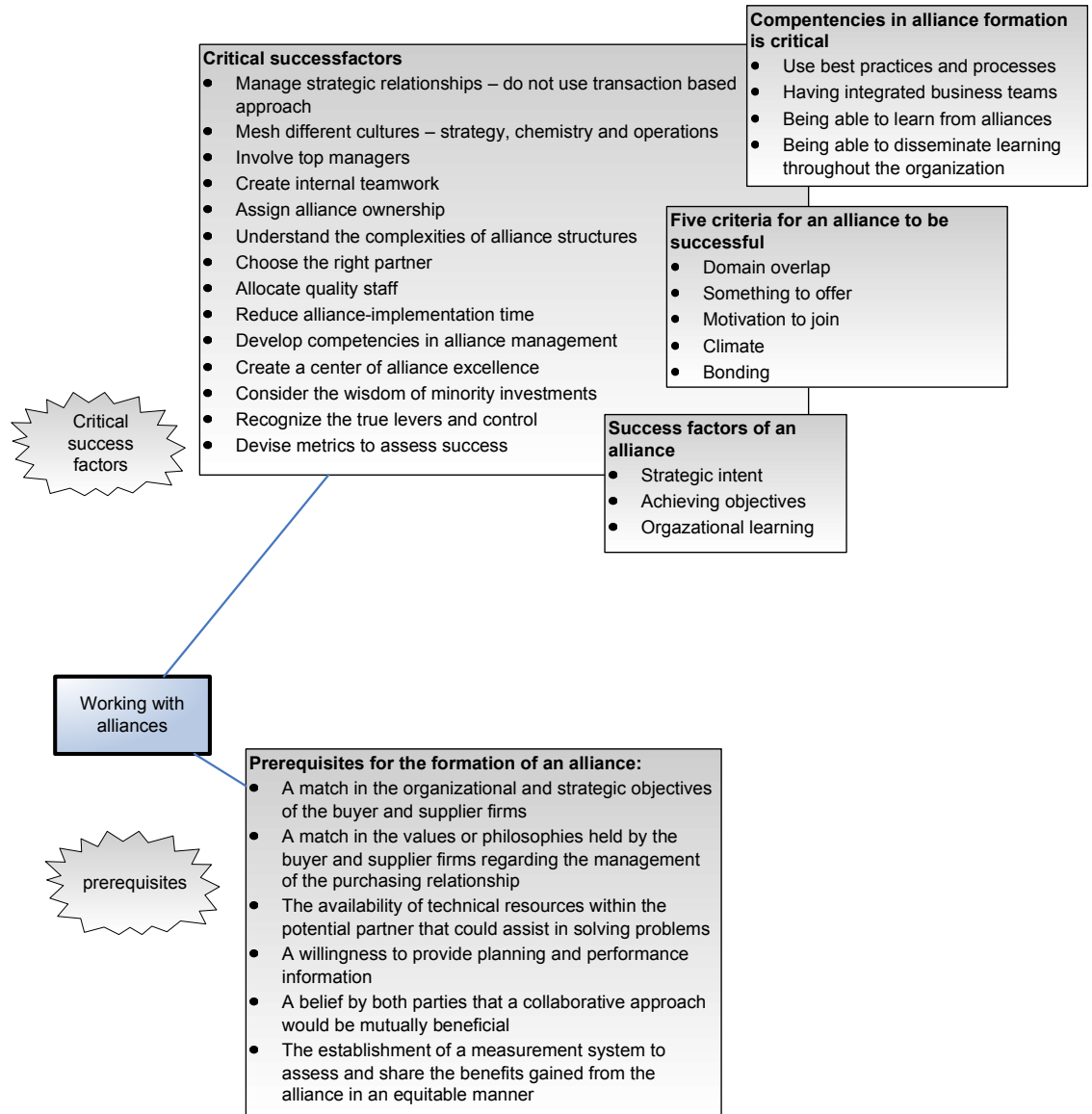


Figure 34 - Prerequisites and critical success factors (Adopted from Stuart & McCutcheon (1996) Milgate (2001) and Killen et al., 2002)

One thing to point out from the figure above is the importance of strategic and cultural fit between the cooperating organizations. It is essential that the parties seek the same things, and that the priorities plus needed time, skills and resources are clear. Lorange et al. (1992) supports this and also points out the importance of getting the acceptance of both internal and external stakeholders, and that this might require political skills. Koza & Lewin (2001) says that symmetry in the strategic intent between the partners increases the odds for success. Furthermore, the strategic intent evolves over time and it is therefore important to focus on it continuously. Brouthers et al. (1995) draw attention to corporate cultures, complementary skills, compatible goals, and commensurate levels of risk (the 4C's) as means to create successful alliances.

Dedicated alliance function

Another thing to point out from the figure above is the importance of allocating the right employees and assure integrated business teams in the alliances, and be sure to

assess the relationship (Milgate, 2001). Lorange et al. (1992) says that the success of the alliances is shaped by people so choosing individuals for key positions is a vital step in the alliance planning. Dyer et al. (2001) share this point of view talking about developing a dedicated alliance function to increase the chances of making a strategic alliance work. The role of the alliance function and how it creates value can be seen from the following figure:

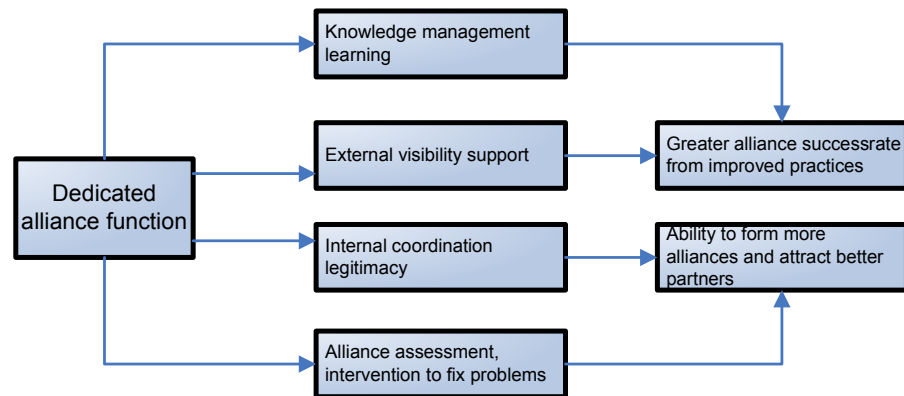


Figure 35 - The role of the alliance function and how it creates value (adopted from Dyer *et. al.*, 2001)

The dedicated function coordinates all related alliance related activities within the company to leverage experience and know-how throughout the company – and it is proved to work (Dyer et al., 2001). Especially, the importance of evaluating the partner’s culture is emphasized because a misalignment is one of the main reasons for failure.

<i>Evaluating the partner's culture</i>	
<ul style="list-style-type: none"> • Corporate values and expectations • Organizational structure • Reward systems and incentives • Leadership styles 	<ul style="list-style-type: none"> • Decision-making processes • Pattern of human interaction • Work practices • History of partnerships • Human resources practices

Figure 36 - Characteristics to evaluate in the partner's culture (adopted from Dyer et al., 2001)

The dedicated alliance function also provides a forum for courses, seminars and networking – all in favour of the alliance. It is important to place it high in the organisation in order for e.g. being able to allocate necessary resources to the alliance when needed without meeting resistance in the organisation. The construction of such a function demands time and resources which requires a large enough business (for further details refer to Dyer et al., 2001).

The life cycle of strategic alliances

The growth of the relationship is also important. A strong bond will not exist from the beginning and therefore it has to be developed over time (Killen et al., 2002). Changes happen in the strategic and operational environment and the people relations shift (Milgate, 2001 and Koza & Lewin, 2000).

Attribute	Initiation stage	Development stage	Maintenance stage
Technical assistance from buyer	Low	Medium	High
Planning information	Low	Medium	High
Feedback information	Low	High	Low
Purchasing philosophy	High	Medium	Low

Figure 37 - Dynamic requirements for strategic supplier alliances: relative importance of key buyer attributes and activities over time (Stuart & McCutcheon, 1996 Table IV)

As it can be seen from the table above, the required conditions for success change as the relationship matures (Stuart & McCutcheon, 1996). Success is not guaranteed just because a good start has been accomplished. Alliances normally evolve through stages, with the levels of information sharing and trust increasing over time (Killen et al., 2002). This suggests dividing a framework for working with strategic alliances into three stages.

Dyer et al. (2001) talk about the alliance life cycle which can be seen from the following figure including useful tools:



Figure 38 - The alliance life cycle and useful tools (adopted from Dyer et al., 2001)

Only the tools that we believe can be relevant to our procedure for entering a strategic alliance is pointed out here (for details refer to Dyer et al., 2001). The above figure is brought here because it supports the structure of our procedure (the procedure consists of three states; initiation, development and mature; see Part 8 – The procedure).

Spekman et al. (1996) also draws attention to a life cycle of an alliance – see the following figure:

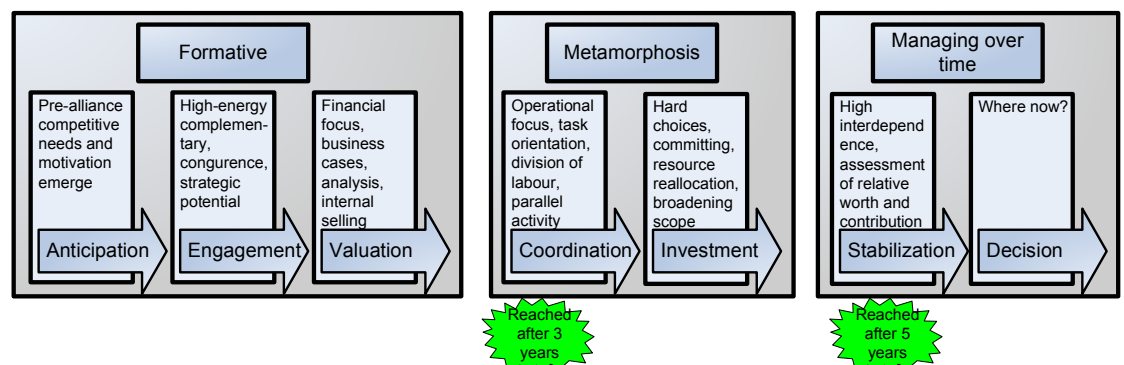


Figure 39 - The life cycle of an alliance (adopted from Spekman et al., 1996)

In the formative stage the vision begins to take hold and is linked to the strategic intent. It is pointed out that it is critical to understand each other. The next stage – metamorphosis – is about coming from vision to viability. The alliance becomes operational, and it is decided how the partners will interact which changes the organization of the partners. A coordination committee is set up to oversee the evolution of the alliance and work teams are created in order to bring the two organizations closer and to effectively manage the alliance's passage from dream to operational reality. As Brouthers et al. (1995) puts it; alliances cannot function from the top down – delegation is required. This can be accommodated by outside consultants. It is emphasized that face to face communications between the committee members are important because it results in less confusion, serves to build trust and help to build important interpersonal relationships. With regards to the last stage – managing over time – it is important that managers focus on staying on the course and adapting the direction of the alliance to reflect both internal and external pressures. In this context it is important to review the process in a blameless matter at regular intervals. Especially the strategic intent is an issue to question because this is the fertile soil for the alliance. The last thing is then to consider what is to be next in which a possibility for a decline is present. This can happen at all times, but is placed at the end to reflect a traditional product-life notion. It is about keeping the alliance on track at all times.

What should also be noticed from the figure above is the notion of when the stages can occur. This originates from their research on strategic alliances, and gives a good indication of the time needed.

The need for skilled people

Spekman et al. (1996) also emphasizes the importance of interpersonal relationships in order to create successful strategic alliances – and that the demands change during the life cycle. It is essential that the right kind of people with the right attitudes work together and develop a personal relationship – trust, communication, perspective taking, rapport building and commitment is pointed out as key characteristics. Good personal relations will support the alliance when the business is under stress. In this connection the alliance manager is also pointed out to have a very important role to play – and it is not easy to do it well. Since alliances are “unnatural” organizational forms which require care and feeding it is unwise to place key alliances in the hands of the inexperienced. The alliance manager serves as the firm's key representative on the alliance management team. The role changes over time, and it is about balancing the needs and concerns of both partners on both strategic, operational and policy level plus leading and motivating people. Credibility as an alliance manager is important and must be earned which takes time. Rupture of the relationship between the alliance managers can affect the relationship very seriously so it is not recommended to change these persons too often. Rotating managers between different departments and assignments to create the sufficient skills to being an alliance manager must therefore be balanced.

Finally, it is pointed out by Spekman et al. (1996) that successful alliances have their origin at the top of the organization. It is the responsibility of senior management to assure that the alliance is tied to the strategic intent of the firm and that the alliance's vision is driven down through the entire organization – speaking with a singular voice is essential. Brouthers et al. (1995) supports this saying that peer relationships between

top executives of alliance partners must be established. For further details on the life cycle of a strategic alliance and for skills of the alliance manager refer to Spekman et al. (1996).

4.3.3.1 Building deep supplier relationships

Liker & Choi (2004) has proposed a very interesting hierarchy in supplier partnering:

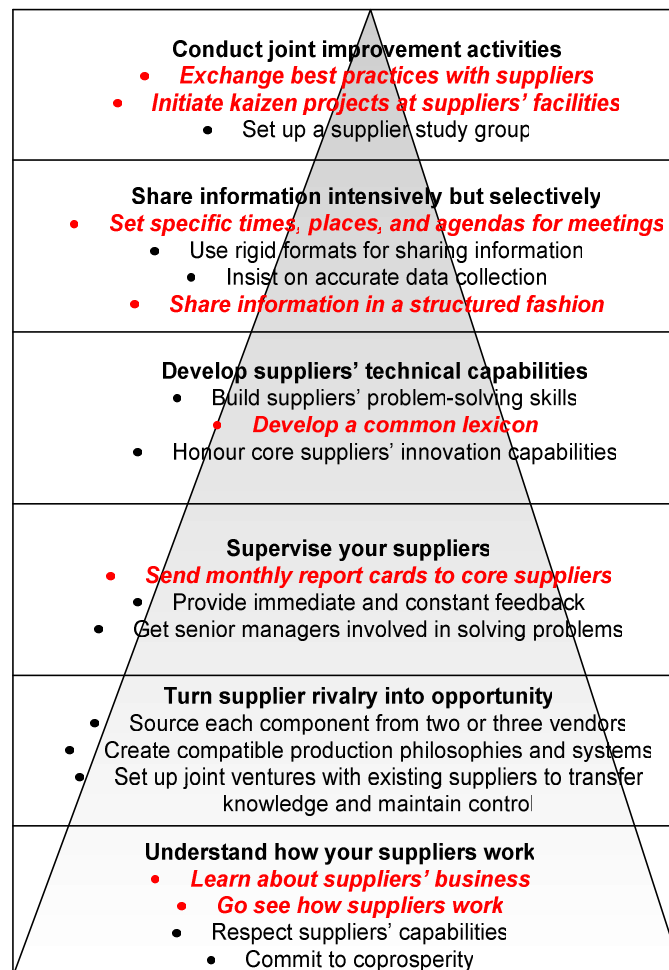


Figure 40 - The supplier-partnering hierarchy (adopted from Liker & Choi, 2004)

We find that the hierarchy presents a really good overview of what is necessary in the work with strategic alliances. Though, it is not very concrete it makes up a good basis for the work of a procedure useable in Denmark.

Their idea is that (American) corporations should build close-knit networks of vendors that continuously learn, improve and prosper together with their parent companies. It is highly based on the work of Honda and Toyota in the US thereby moving critics since these two companies replicated the Japanese conditions in a western culture – and with great success (For details see Liker & Choi, 2004).

As can be seen from the figure above a number of points have been emphasized. These are used in particular when working out the procedure for entering a strategic

alliance. To begin with it is important to learn about the suppliers' businesses, including going and seeing the fact Common for the remaining points is the development of all parties through collaboration. To be successful in this process it is important to share information selectively in a structured manner, plan meetings in a structured way, and work together on kaizen projects sharing best practices. Honda e.g. uses engineers to lead kaizen activities at the supplier's facilities.

Comparing to the short term focus often prevailing in Danish companies one of the points of Liker & Choi (2004) is that suppliers' innovation capabilities are more important than their wage costs. Once the capabilities have been developed, they are more valuable than low-cost vendors. This also indicates the need for looking at the strategic alliances in stages. The foundation needs to be in place after which suppliers can be developed and connected into networks – supplier associations.

4.3.4 Limitations

Strategic alliances are of course not only about benefits and gains. It is also important to keep the limitations and risks in mind. Maloni & Benton (2000); Bicheno (2004) and Akacum & Dale (1995) all points out different downsides. Here the following are drawn to attention:

Limitations of strategic alliances

- **Heavy reliance on a single partner**
- **Loss of core competencies**
- **Decreased competitiveness and losing attractive marketplace opportunities**
- **Cost of establishment**
- **Inappropriate choice of partner**
- **Opportunistic behaviour**

Figure 41 - Limitations in strategic alliances (adopted from Maloni & Benton, 2000; Bicheno, 2004 and Akacum & Dale, 1995)

What is important is to maintain the control and overview of the important areas in order to maintain influence and keep the limitations to a minimum. Sometimes an in-house capability is necessary in order to maintain control (see Ahmadjian & Licoln, 2001 on the relationship between Toyota and Denso).

4.3.5 Power issues

Slack & Lewis (2002) argues that it is usually the customer side of a partnership which has a far greater saying in the coordination of activities than the supplier simply because they are closer to the demand driven end of the supply chain.

The point is to realize the power issues. As pointed out by Maloni & Benton (2000) it is a question of using power in the right way since both the relationship and the performance of the supply chain benefit from this. Inter-firm power can influence supply chain relationships and be a barrier to win-win integration. They present different bases of inter-firm power (Maloni & Benton, 2000, table 4). What should be drawn to attention is that the power asymmetry, that might exist, can be used as a beneficial tool for improving the relational orientation of the supply chain – as long as the right power bases are used (expert, referent and legitimate – see Maloni & Benton, 2000 for

further details). This implies that companies must understand their partners also in respect to sources, imbalances, and consequences of power and manage it accordingly.

4.3.6 Sharing the benefits

Sharing of the gained benefits is one of the important elements in partnerships. One must believe that something is gained in order to be committed. At the same time it is a very difficult area, and it is hard to find literature saying how to do it.

Jones & Womack (2003) deals a little with the subject saying that winners need to compensate losers. Participants that take actions to optimize the whole without gaining some are likely to stop the relationship. They advise to keep it simple and determine the incremental cost and benefit of each change made in order to clarify the total amount of benefits gained. Further details on this subject have been experienced from Toyota (see Part 5 & 7 – Fieldwork in Japan and Brussels).

4.4 Supplier associations

More and more companies know the term supplier associations – known as *kyoryoku kai* in Japan – and even more important its impact on business. Toyota uses the concept outside of Japan in the US with great success. The suppliers are critical to the success of Toyota, and therefore it is necessary to help them to be the best (Dyer & Hatch, 2004). The definition of a supplier association used here is from Rich & Hines (Bicheno, 2004 p. 191 also refers to this definition):

"a mutually benefiting group of a company's most important subcontractors, brought together on a regular basis for the purpose of co-ordination and co-operation as well as to assist all the members to benefit from the type of development associated with large Japanese assemblers: such as kaizen, just in time, kanban, U-cell production and the achievement of zero defects"

Rich & Hines (1997, p. 218)

What should be captured are the characteristics of supplier coordination and development (see also Hines, 1994). The basic idea is that 1st tier suppliers are worked with who again work with their 1st tier suppliers resulting in improvements, learning and standardization for all suppliers (for a list of aims of supplier associations see Bicheno (2004). A forum is created in which experiences are shared and duplication of effort and resources by individual initiatives between the customer and supplier are eliminated (Rich & Hines, 1997) – it is all about learning from each other.

Three types of associations exist (for operations, purchasing and marketing) of which we are focusing on the one for operations (Bicheno, 2004) – the above definition is also tied to this one. Bicheno (2004) further argues that the concept of supplier association is an extension of the supplier partnership concept (strategic alliances). The extension lies in the networking part increasing benefits for all members.

Supplier associations have its roots in Toyota in the 1930s (Hines & Rich, 1998) saying that Toyota has a lot of experience in the field. This also indicates that it builds on practical work and not on theoretical thoughts which is an important point.

4.4.1 Working with supplier associations

To begin with it should be stressed that the field is difficult as experienced by Toyota in the US (Dyer & Hatch, 2004). From the experiences in the UK (Hines, 1994) it is interesting to see how much time is actually required to make it work – patience is necessary.

As indicated by the definition, the most important suppliers are the ones targeted. Bicheno (2004) claims that the targeted suppliers are usually the ones depending on a parent for a large amount of their business (e.g. 25% or more) and control a high percentage of the value adding processes in the supply chain (Rich & Hines, 1997).

Rich and Hines (1997) put out a network sourcing model outlining required features for creating and maintaining excellence in connection with supplier associations. It is divided into structural and behavioural features and is mentioned here to emphasize that supplier associations are not always the way to deal with suppliers. To mention some of the structural features, it is important that there are a large number of sub-contractors of high quality, and that many of these depend on one firm to purchase more than half of their output. In terms of the behavioural features there must be a preference for dealing with a few firms when purchasing and doing it in a long-term and ongoing relationship. Furthermore, dealings are regulated through tacit understanding rather than documented contracts and the sub-contractors must accept partial control of internal management by the core firm. For further details see Rich & Hines (1997).

To put supplier associations into perspective their role in the supply chain is outlined (discussed by Rich & Hines, 1997). The suppliers are a key factor for the Lean enterprise since the structure of supplier associations enhances communication and the responsiveness of the supply chain (Rich & Hines, 1997). It is possible to process information quickly, direct the effort of the entire supply chain and develop innovative supplier partnerships. The dimensions of the supplier association can be seen from the figure below:

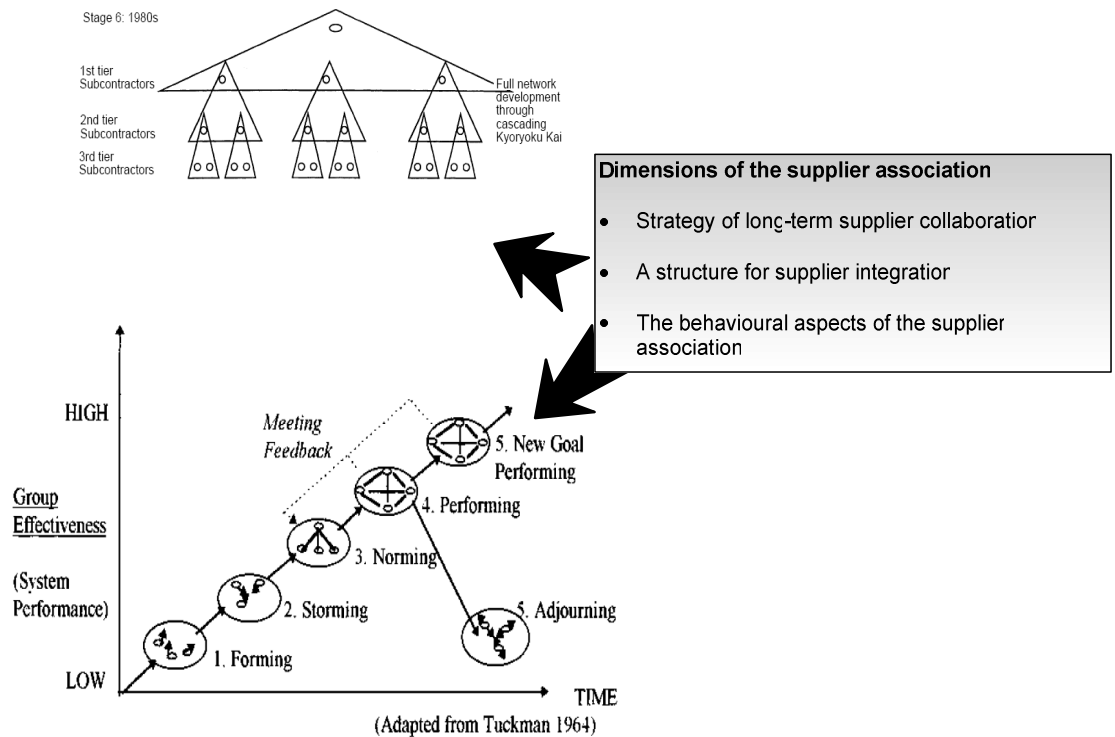


Figure 42 - Dimensions of the supplier association (Based on Rich & Hines, 1997)

The strategy of long-term supplier collaboration has been outlined in the section concerning strategic alliances. In this context though, the role of the purchasing department is important. They become the key interface in the work with suppliers; defining expected customer service, developing the skills and coordinating the activities. They also develop criteria for checking the strengths of suppliers in terms of price, cooperation, quality, delivery, technology and overall management competence (Rich & Hines, 1997 supported by Bicheno, 2004 and Womack & Jones, 2003).

With regards to the structure for supplier integration, forums of coordination and development create linkages throughout the supply chain. In this way efforts are directed towards the same goals eliminating duplication of efforts and instead facilitating learning. The grouping of suppliers also makes the purchasing department capable of focusing group activities, and maintaining control and direction of developments (Rich & Hines, 1997).

The final point is the behavioural aspects. Scepticism is often present in the beginning but an identity is developed in the group over time. It is in other words important to be aware of time required to develop supplier associations (see the figure above). The associations also help to create an environment of trust since views are exchanged and the forum creates a basis for developing the social aspects.

Dyer & Hatch (2004) also discusses the role of supplier associations highly based on the work of Toyota in the US. They put out a model for facilitating network learning as Toyota does it:

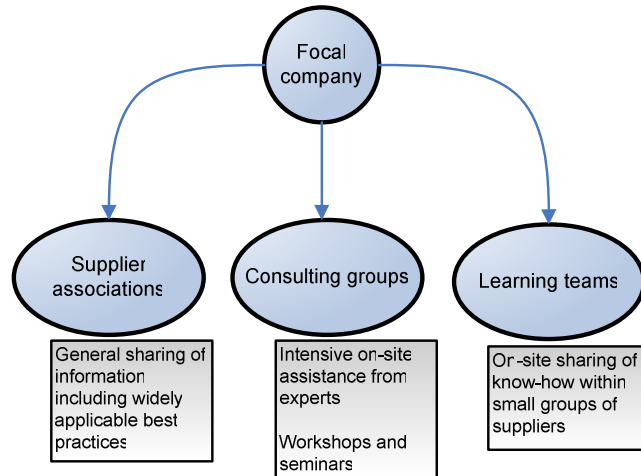


Figure 43 - How Toyota facilitates network learning (adopted from Dyer & Hatch, 2004)

We believe that this structure present a good framework for working with strategic alliances and networks of suppliers in the supply chain – and Toyota has proven it to be very successful. The supplier associations have already been outlined above. The consulting groups are essential in acquiring, storing and diffusing valuable knowledge and to help and assist when ever needed. Suppliers are required to share project results and best practices encouraging other suppliers. In learning groups – *jishuken* in Japanese – suppliers are grouped into *volunteer* study groups to work together on productivity and quality improvements. It facilitates knowledge sharing through which members learn as a group. Different themes are chosen in cooperation with the consulting group and these are addressed at each member plant (this concept was also verified at the visit at Toyota), and valuable lessons are shared throughout the supplier network. At TMC this structure is headed by purchasing and the Operations Management Consulting Division (OMCD).

They further address the evolution of the network:

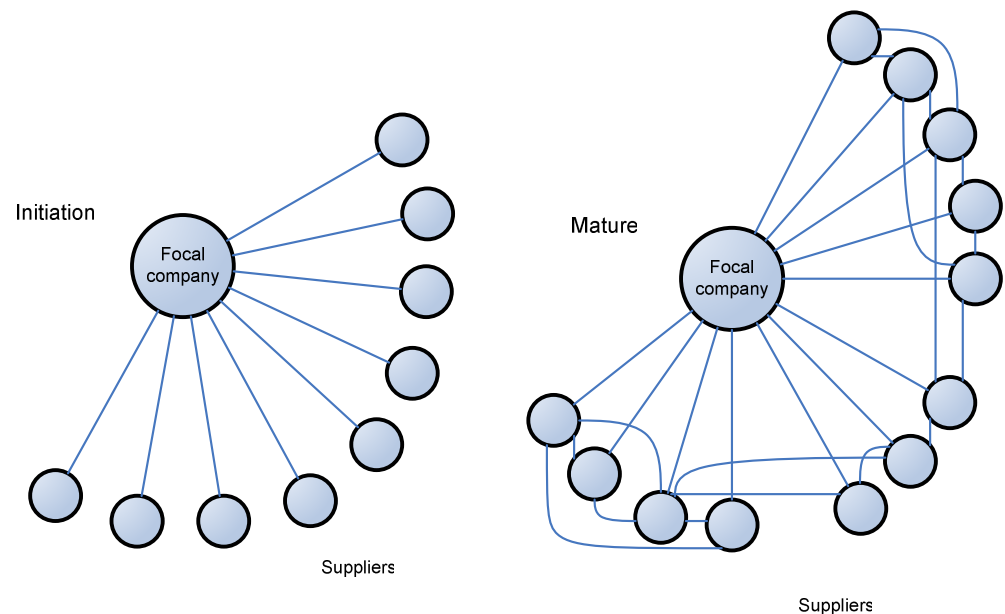


Figure 44 - Evolution of the network (adopted from Dyer & Hatch, 2004)

As can be seen from the figure suppliers begin to form alliances only after each relationship has been build with the focal company. Dyer & Hatch (2004) talks about the development in three stages – initiation, development and mature, which support the idea of a model in three stages (as indicated also in the section about strategic alliances). The consultants of course have different assignments throughout the process – e.g. in transferring tacit knowledge (for an explanation on tacit and explicit knowledge refer to Dyer & Hatch, 2004 p. 60). The shared purpose and the amount and kind of information between suppliers evolve creating stronger ties and identity as time goes by.

4.4.2 Meetings

An important issue is the meetings necessary to make the supplier associations work. It ensures direct person-to-person contact and provides a channel for communication related to both work and the social aspects (Hines & Rich, 1998). Toyota’s supplier association operates at three levels as can be seen from the following figure:

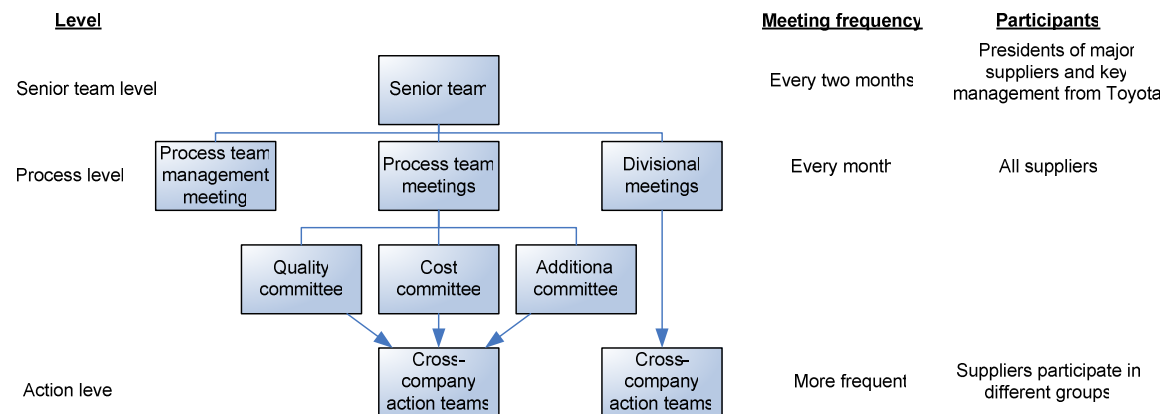


Figure 45 - Meeting structure and frequency within Toyota's supplier association (Adopted from Hines & Rich, 1998)

As can be seen the frequency and participants differ for the different levels. This is also true for the outcome of the meetings. The senior level sets policies and steers the direction and discusses target areas for the supplier community. These directions steers the various process teams. It is identified how cross-organizational processes can be coordinated between the individual suppliers and Toyota. Cross-company action teams are set up in order to improve similar processes within own companies (See also Rich & Hines, 1997 on the subject).

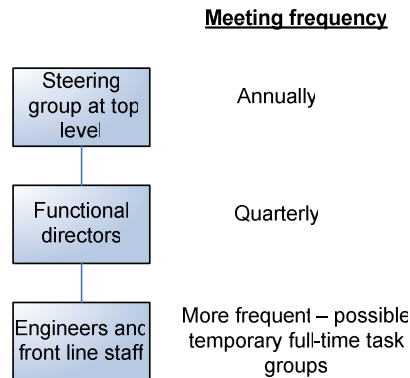


Figure 46 - Meeting structure and frequency (Adopted from Bicheno, 2004)

The subject is also addressed by Bicheno (2004) – see the figure above. Even if the frequency is a bit different from Hines & Rich (1998) the overall structure is the same. Bicheno (2004) further points out that support staff may be appointed from time to time when needed, and that annual or biannual meetings are held to look at performance figures of the different suppliers.

The approach is also used in the US by Toyota with success (Dyer & Hatch, 2004). In addition e.g. tours of “best practice” plants are used. What is important from this discussion is the meetings and the way they are organized. Besides sharing valuable knowledge it also provides a forum that helps develop the relationships and build trust between members (Dyer & Hatch, 2004 and Rich & Hines, 1997).

4.4.3 Competition



Competition between members in a supplier association, who are cooperating at the same time, is a difficult area. When asking the people at Toyota the question was not really answered (TMC interview, 2006). TME did not talk about it as being a problem. They know that suppliers will use the benefits gained from working with them in other areas, but as long as they achieve their targets they do not care.

It is a subject to be aware of, but not necessarily to avoid since it might create opportunities for both parties in the relationship (Liker & Choi, 2004). Karlsson & Åhlström (1997) say that collaboration in networks, which is a characteristic of the Lean enterprise, happens with specialists regarding this areas, including competitors. According to Milgate (2001) there are two important factors in addressing the area. The strategic intent must be clear and communicated to the partners and there need to be openness about what is expected to be gained from working together.

4.5 Keiretsu

The Japanese Keiretsu is an often cited characteristic of the industry in Japan. But through our research in Japan the discussion has only a few times concentrated on this subject, and it has in general not been emphasized. For this reason keiretsu have not been given much attention in this project, but it is dealt with here because it plays a

role for Toyota's supply chain. The question is how much importance it has when wanting to transfer the principles learned in Japan to Denmark.

Keiretsu is interesting because it is not found outside Japan in the same way. Furthermore, it is often argued to be one of the main reasons for the Japan's success in the global competition (see e.g. Ellram & Cooper, 1993). At the same time some western executives see keiretsu as inefficient and inflexible because companies are locked into buying components from specific suppliers which is argued to lead to additional costs and technological compromises (Liker & Choi, 2004). There are in other words some cultural differences to take into account when dealing with keiretsu.

For the purpose of this project the following definition will be used:

"The keiretsu are groupings of Japanese firms with historic associations and cross-shareholdings, such that each firm maintains its operational independence but establishes permanent relations with other firms in its group. These groups emerged from the break-up of the zaibatsu or holding companies which dominated Japan's pre-war economy. Keiretsu may involve firms in widely different industries or be vertically-integrated, such as the Toyota Group. Typically they will include banking, insurance, construction, electronics, chemicals and engineering".

Quotation from http://www.autoindustry.co.uk/features/dictionaries/dict_6

This definition has been chosen because it outlines the essential characteristics of keiretsu: grouping of firms with historical associations, cross-share holding, operational independence and permanent relations. The purpose is to maintain security and the growth of each business and the group as a whole.

The formation of keiretsu was encouraged by the Japanese government after WWII as a way to pre-empt the entry of foreign competition, while strategically positioning Japan's limited resources in key industries. It dates further back though, to the feudal system in Japan much like keiretsu. It represents a unique "Japanese way" of competing which reflects Japan's culture, economic philosophy and industrial organisation (Ellram & Cooper, 1993).

There are two basic forms of keiretsu; finance/banking and supply characterized by respectively horizontal and vertical integration. The last has to do with a network of firms linked along the supply chain and led by a major manufacturer like in the case of Toyota. They often direct control in its key suppliers, which secures that Toyota is always prioritized by its suppliers. The leadership is important for providing overall direction, control, and a common vision to the keiretsu. Some of the benefits are risk reduction, security in operations through closed communication, joint ownership, and long term commitment and vision (Ellram & Cooper, 1993). Keiretsu overcomes some of the Danish characteristics that are working against a successful implementation of close relationships (see Part 6 – Comparing Japan & Denmark) – which makes keiretsu interesting.

4.5.1 Applicable outside Japan?

Many of the things that keiretsu secure – e.g. information sharing, joint planning, coordination among multiple levels in the supply chain, compatible philosophies, reduced supplier base (Ellram & Cooper, 1993) – are characteristics necessary to compete in the global market today. This might create an advantage for the Japanese companies, but the importance of keiretsu are given smaller and smaller value (see e.g. Ahmadjian & Lincoln, 2001).

As argued by Ellram & Cooper (1993) western industry builds upon other concepts than the Japanese – especially the opportunity to walk away if the relationship is not seen beneficial. Most companies value their autonomy too much for keiretsu to be a success in western conditions. Furthermore, the degree of control might be seen as negative by many companies. We agree with this point of view.

From the discussion on Keiretsu, it is apparent that it has many similarities to supplier associations. It is more relevant to talk about supplier associations and strategic alliances in which one might choose to invest in shared assets like information systems or specific production machinery since this suits the conditions in the West (and Denmark) more. The decision of cooperation is done from a cost perspective and not determined by ownership. Toyota is also very prominent within these fields, and there is without question much to be learned here. The cooperative, coordinating long term atmosphere is not to be mistaken – there are many benefits to be gained no matter if it is called keiretsu or supplier associations. It is a matter of picking out the good things.

In general Toyota's supplier network is greatly emphasized (see e.g. Dyer & Hatch, 2004). This was also confirmed by Mr. Adams, Purchasing Senior General Manager at TME. It is important to pick up best practices and use them throughout the company. One should though, also be aware of the risk of leaking technology between competing suppliers.

Finally, as also pointed out by Ellram & Cooper (1993) there are potentially illegal aspects of keiretsu outside of Japan. Not allowing suppliers to deal with others might be a breach on the free competition – in fact competition is often encouraged through legislation.

4.6 Best practices

A number of best practices especially in the UK and Toyota in the US have been studied to give inputs to the procedure and give different points of view. Experiences from both strategic alliances and supplier associations are brought here because both can be used. The area is relatively new outside Toyota so there is a lot of valuable information to gain. It has been arranged in agreement with the stages in the procedure.

The found cases are characterized by a focus on the first stages. E.g. NEC mentioned that Toyota is the mature state, and that NEC after 5-6 years of work within the field certainly had not reached beyond the first stages (NEC interview, 2006). It takes time!

Dell is also often used as a role model-company:

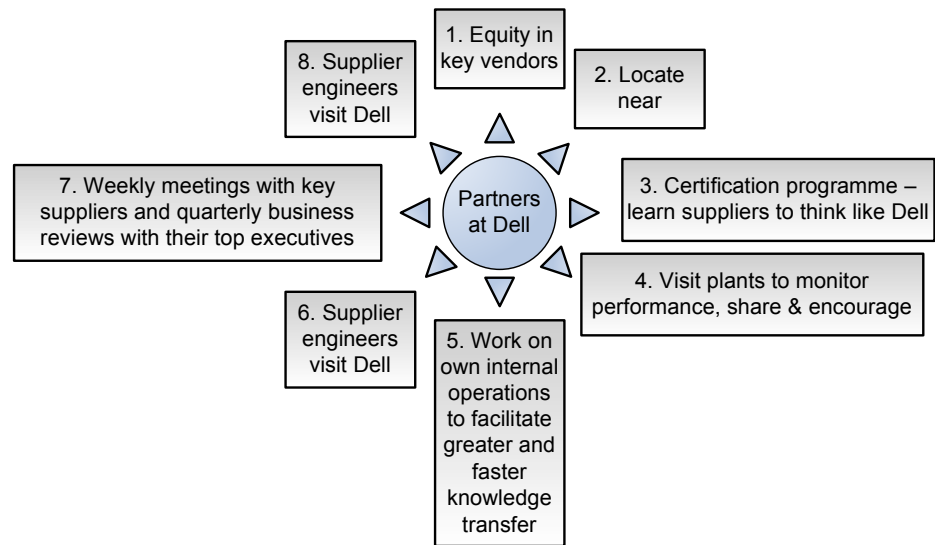


Figure 47 - Partners at Dell (Adopted from Dyer & Hatch, 2004)

This is comparable to the experiences from Honda and Toyota in The US (Liker & Choi, 2004). It is in other words very useful to look at the approach of successful companies. Another general aspect is the set up of a “Lean function” as suggested by Womack & Jones (2003).

4.6.1 Initiation and development state

Hines (1994) puts out two cases to illustrate a number of experiences in supplier association in the UK.

<i>Experiences from the UK</i>	
<ul style="list-style-type: none"> • Seminars for senior staff and practical workshops for operational staff during the first year • Start with a review of strengths and weaknesses 	<ul style="list-style-type: none"> • The early activities are about getting to know each other – creating a culture of collaboration and exchange

Figure 48 - Experiences from the UK. Adopted from Hines, 1994 and Rich & Hines, 1997

The seminars and workshops encourage knowledge sharing and best cases can be shown in practice generating enthusiasm between the suppliers, and developing the inter-company relationship which is very important. The use of meetings throughout the year is also supported by Bicheno (2004), Akacum & Dale (1995) and Emiliani (2000). So called supplier days are held facilitating training and improvement forums for the suppliers, explaining company plans and objectives, giving factory tours, giving out prizes for best performance etc. A thing experienced in this context from Toyota is the importance of maintaining key-personnel tying them to the alliances for as long as possible since trust is much about personal relations (TME interview, 2006).

Benchmarking exercises help the customer in gaining a closer understanding of its suppliers as well as building a mutual bond (Hines, 1994). On the basis of the outcome, the future events are planned including a number of e.g. seminars. It is also valuable to visit other companies in order to see things in action.

4.6.1.1 Education

It is often necessary to educate suppliers in order to convince them about the relationship and reach a certain level before the real work can begin. Emiliani (2002) puts out a number of valuable experiences from developing a network of suppliers:

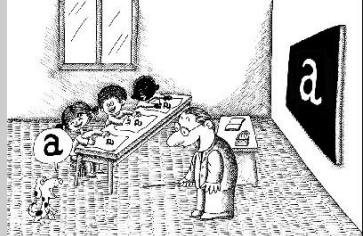
Education	
<ul style="list-style-type: none"> • Explain benefits in relation to the suppliers' own interests • Present topics solely from the viewpoint of the buyer to make suppliers feel more "safe and avoid exposure to begin with" • Use factory tours to witness results from e.g. kaizen events • Train suppliers in kaizen events using an experienced person as facilitator 	

Figure 49 - Education of suppliers (adopted from Emiliani, 2002)

To create productive interaction the buyer should commit to solve problems at the supplier prior to requiring the adoption of Lean. To reinforce the concepts personal follow-ups to measure progress are important as well as distribution of relevant information (Emiliani, 2002).

4.6.1.2 Contracts

Akacum & Dale (1995) concludes on partnering sourcing practices from 11 companies in the UK. One of the conclusions mentioned contracts as an unessential feature of the partnership giving personal relationships and mutual trust greater importance. The arrangements were informal or based on a one-year trading contract revising the alliance at the end of the year.

On the other hand Milgate (2001) claims that it is always advisable to put things in writing, no matter how informal the alliance is. He further puts out the content of a detailed agreement (for details see Milgate, 2001):

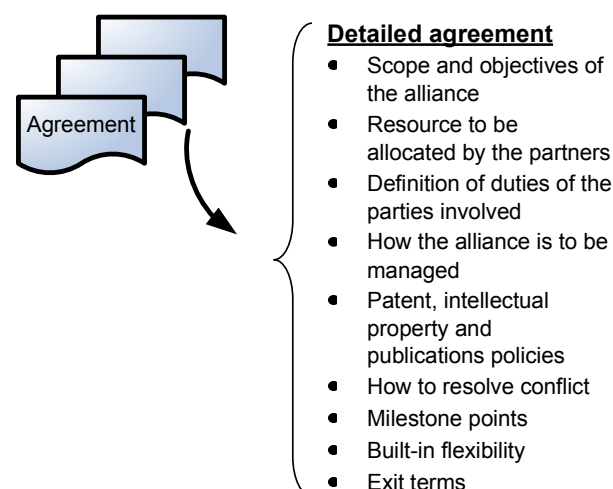


Figure 50 - Content of a detailed agreement between partners (Adopted from Milgate, 2001)

Because of the short-term focus in Denmark as described earlier, we believe it is favourable to write things down, and do it for one year at the time – at least for the first couple of years. In this way, one can always use the contract if disagreement occurs until a sufficient level of trust has been build.

4.6.2 Mature state

Strategic alliances and suppliers associations are set in an uncertain and dynamic market, requiring priorities and focus to change continuously (Rich & Hines, 1997). It is not an easy task and it takes time to build.

Allocating dedicated staff is important here as in all stages. This is brought out by Killen et al. (2002) in connection with a study of a strategic alliance between General Power Controls (GPC) in Australia and Toshiba. They are not on the same stage as Toyota but it gives another perspective. A hotline was established directly between the top managers and engineers from GPC worked at Toshiba on projects in order to get a better understanding of the processes at Toshiba. Also, GPC found it very important to look at culture and teamwork when hiring people, since the wrong attitude could easily damage the company.

4.7 The role of SMEs

Our proposed procedure for entering strategic alliances takes the perspective of a bigger company working with a number of suppliers. The situation for small and medium sized companies (SMEs) may be another – e.g. relying on *one* big customer and therefore putting all resources into making this particular relationship work. The Danish industry is characterized by a large portion of SMEs (Jensen, H, DI, 2006 and Martin, 2004), and therefore the role of these need to be commented on (possible differences in the definition of a SME is not taken into account. An overview is the purpose).

Advantages	Disadvantages
<ul style="list-style-type: none"> • SMEs aid ability to integrate suppliers at all levels • Improvements from spreading Lean especially happens when a larger company is influencing one or more of its smaller suppliers 	<ul style="list-style-type: none"> • Strategic alliances work better when the difference in size is small • Levels of risks can be a problem if a large difference in size exists

Figure 51 - Advantages and disadvantages of SMEs (adopted from Rich & Hines, 1997; Phelps et al., 2004 and Brouthers et al., 1995)

As seen there are both advantages and disadvantages of SMEs and it is important to be aware of these. Larger businesses must in other words understand the strengths of small businesses since they play a vital role (Emiliani, 2000 and Karlsson & Åhlström, 1997).

Karlsson & Åhlström (1997) deals with the subject of whether the Lean enterprise concept applies to SMEs since it originates from Toyota which is a very large and worldwide company – and they end up concluding that it does. Some principles are even more important, e.g. strengthening the firm's position relative to its competitors through the building of a position in a global network of competences. They also

point out that network building is the task of the larger firm, which support our chosen perspective of the larger company. Final Milgate (2001) argues that the global market will be dominated by large alliances with large companies as the leader.

Location

An interesting conclusion by Karlsson & Åhlström (1997) is the avoidance of large geographical distances for SMEs when collaborating in more complex and knowledge-based relationships. The competences and resources needed for this might be scarce in SMEs, and made more difficult over long distances.

"We make a budget each year for the travel expenses. We know it is going to be exceeded but we do not care – go-see-the-fact takes what it takes"

Mr. Shah (TME interview, 2007)

TME are aware of location, and suppliers are encouraged to move close but it is not crucial (TME interview, 2007). Denmark is not a big country in this matter, but it is still important to bear the location in mind.

4.7.1 Limitations & gains

<i>Gains</i>	<i>Limitations</i>
<ul style="list-style-type: none"> • Improved reputation from supplying a larger reputable company • Opportunity for growth 	<ul style="list-style-type: none"> • Fear of being replaced – risk of market security • Imbalance in power

Figure 52 - Gains and limitations for SMEs (adopted from Akacum & Dale, 1995 and Killen et al., 2002)

Akacum & Dale (1995) say it is not advisable to rely too heavily on personal agreements, because it creates a dependence on changes in the customer organization. Additionally, the small companies examined tried to develop relationships with customers instead of suppliers because it is perceived to have more benefits.

Because of the importance, SMEs put a lot of effort into maintaining the relationship with bigger companies (Akacum & Dale, 1995). But resource constraints can be faced which makes it difficult to invest the required time and energy into setting up and maintaining the network (Killen et al., 2002). Add imbalance in power between large and small organisations, and it might look disadvantageous making the needed trust hard to establish (Killen et al., 2002). But as mentioned earlier, both parties can benefit if power is dealt with in the right way.

We believe that the benefits outweigh the limitations. Even if the suggested procedure for entering strategic alliances is made from the perspective of a bigger company, SMEs can use it in many ways since they represent one part of the relationship. Killen et al. (2002) says that strategic alliances can enable both larger organisations and SMEs to be flexible and responsive to market needs while keeping costs down.

4.8 Part conclusion

In literature strategic alliances have only been dealt with to a small degree in connection with a Lean supply chain but it is argued to be a very important element. From our point of view it makes good sense to combine the two things, since it is all about creating a more efficient business – and that is certainly the case when companies work together in close relationships.

Different life cycle models of a strategic alliance have been brought out. On a general level the states can be divided into three; initiation, development and mature. As pointed out here and by literature, strategic alliances are not easy to manage, and there is a high failure rate. It is in other words important to keep focus at all times, and identify the critical areas. The most important ones as we see it have been summarized below:

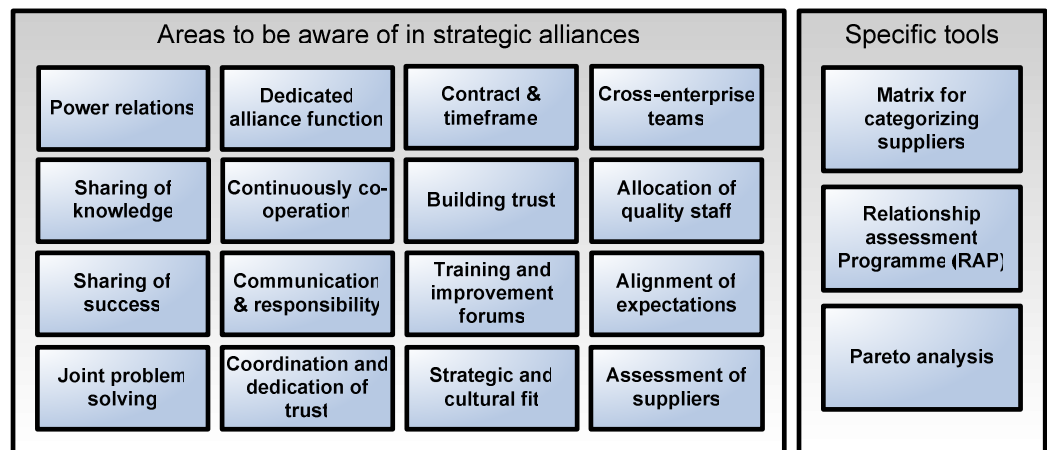


Figure 53 - Areas to be aware of in strategic alliances (based on the theory outlined)

Furthermore, some specific tools have been pointed out to use as also seen from the figure above. The areas originate from both strategic alliances and supplier associations but the procedure will focus on strategic alliance since we believe that this is the starting point for the Danish companies. Supplier associations that build upon strategic alliances will follow in the years to come.

Keiretsu has been mentioned since it is often connected with the success of Toyota. As argued the importance of keiretsu is falling, and supplier associations have more value outside of Japan.

Part 5 FIELDWORK IN JAPAN

Part five deals with the investigation of eight Japanese companies – Toyota (including three suppliers), NEC, Kawasaki, Denso, and Hitachi. The chosen focus on partnerships of course influences the fieldwork in Japan, and only information and conclusions relevant for our work with the procedure for entering a strategic alliance, will be brought here.

CONTENT

- 5.1 INTRODUCTION
 - 5.2 METHOD
 - 5.3 TOYOTA MOTOR COMPANY
 - 5.4 NEC PERSONAL PRODUCTS
 - 5.5 KAWASAKI HEAVY INDUSTRIES, LTD
 - 5.6 DENSO
 - 5.7 HITACHI
 - 5.8 PART CONCLUSION
-

5.1 Introduction

The field work in Japan gives the opportunity to investigate the Japanese production system with our own eyes instead of imagining it through the books. All together it counts for four days at Toyota including three suppliers Toyoda Gosei (1st tier), Otics (1st tier) and Ichiei (2nd tier) and one day at NEC, Kawasaki, Denso and Hitachi. Date for the visits appear in the figure underneath.

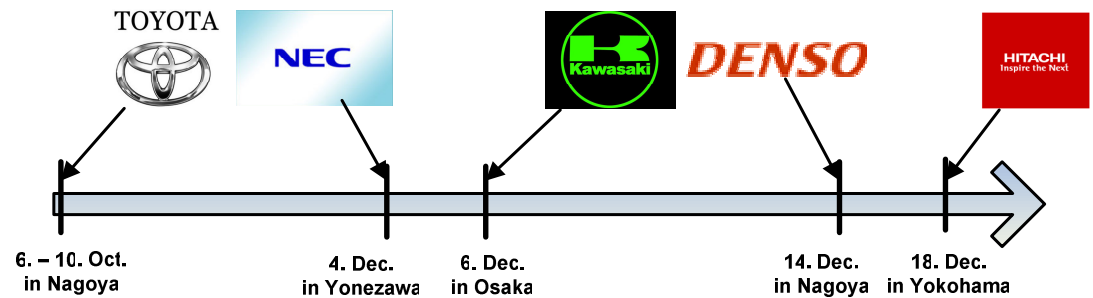


Figure 54 - Time framework for the visits

First company visited was Toyota in Toyota City (Nagoya) which was one of the main purposes of the fieldwork. The fact that we stayed there for four days made it possible to use Toyota as a case-company to compare the remaining Japanese companies with and that is why Toyota acts as our basis. The field work represents our perception of the companies and their production systems and it may differ from the many books and articles within the field.

During the meetings a lot of information was given – a lot of it without any relevance to this project – and for that reason it will not be mentioned. Main focus is the strategic alliances and the structure of the representation of the fieldwork will be characterized by this (for further details of the meetings, refer to appendix E and F). Only short company profiles will be given.

Some parallels will be drawn between *“The Toyota Way Fieldbook”* (Liker & Meier, 2006), and our actual perception and experience. This is done to show similarities and dissimilarity and to substantiate our perception in certain cases.

5.2 Method

Contrary to the procedure in Denmark we could not ourselves arrange the meetings and decide who to speak to. This had to be done through Professor Kimura, and we were therefore dependent on him, and the willingness of the Japanese companies to set up meetings. All the meetings had the same structure:



Figure 55 - Outline of the meetings

The structure gave a good basis for gaining a lot of information on a short time. Toyota was an exception on this area since we visited them for a week allowing a deeper investigation. An overview of our thesis was sent beforehand outlining the purpose of the visit and detailing the topics for discussion:

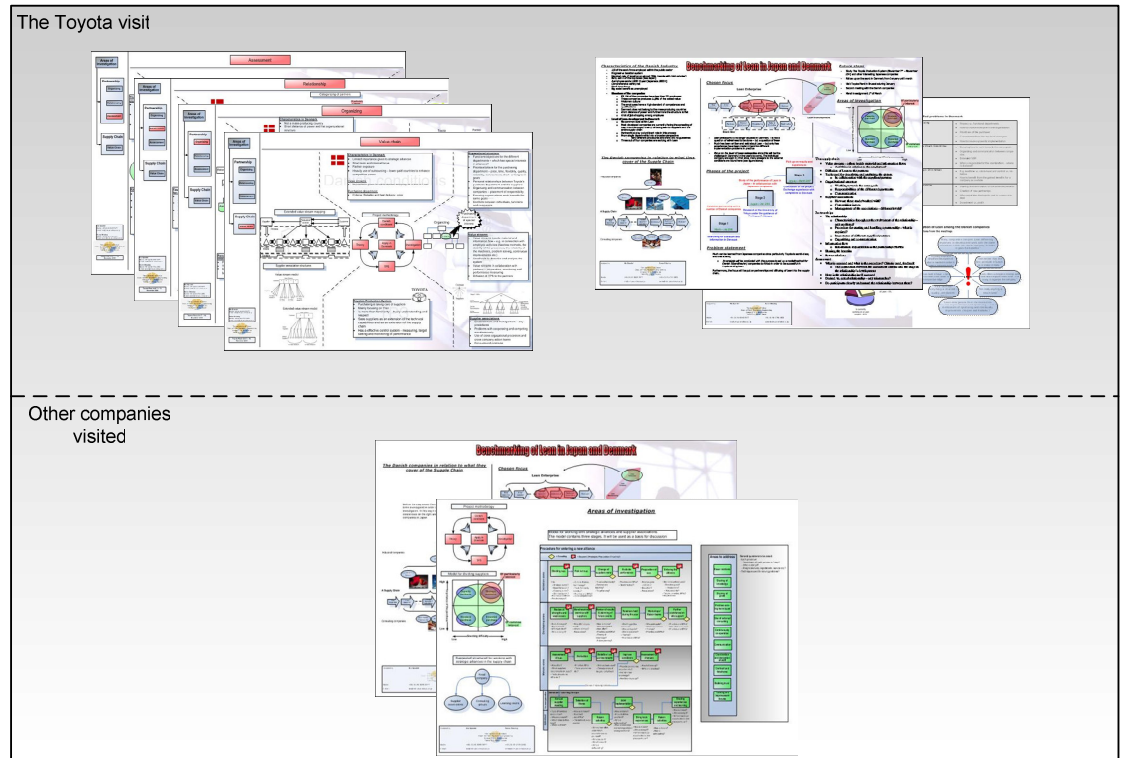


Figure 56 - Information sent to the Japanese companies (see appendix E and F for full size)

The particular content discussed changed over time as the focus of the project evolved and information was gained. As a starting point the areas were wide in scope, but after Toyota they were narrowed down because of limited time at each company visit. The procedure became the starting point for discussion since it was developed. No generic set of questions was used for all companies; rather questions were asked as the individual meeting developed on the basis of the procedure. We experienced that this approach secured the most useful information.

It has been the attention to stay neutral towards the gained data, but since much has been experienced through tours of the production, our own opinion will shine through in some areas.

5.3 Toyota Motor Company



The Toyota visit was held from the 7th of November until the 10th of November and prior to that, we made a plant tour at Tsutsumi Assembly Plant where the Prius Hybrid car is made. The initial plan was a visit with duration of three to four weeks, but due to the communication – our lack of the Japanese language – it was shortened down to one week. Though, it has been a very interesting week with a lot of impressions and experiences.



In advance of the stay, a training schedule (appendix E3) was sent to us showing a detailed sequence of the four days – it was obvious that nothing was left to chance. During the four days the TPS was taught through lectures, meetings, plant operations, visits at museums, conversations and visits at suppliers of Toyota. All this was done by the Operations Management Consulting Division (OMCD). Even though one knows the meaning of kanban from the theory (e.g. Ohno, 1988) as a synonym to TPS, it gets an entirely new meaning – it is obvious that it forms the fundamental part of the system. It is impressive and furthermore, all the impressions were reinforced by the people we met. Mostly it was managers, general managers (e.g. the descendant of Taichi Ohno) and other highly placed employees, and their dedication and enthusiasm were very remarkable. Compared to the typical manager from a Danish company, it is obvious that the Japanese employee has a more thorough and deep understanding of TPS. It lies within their spirit as a naturally part of their routines at work and way of thinking – all together very amazing. One must see it to get the fully understanding of the philosophy and culture behind TPS!

Each day was divided into topics to illustrate the different circumstance of TPS, but in this part the experience is described with the strategic alliances in mind, why the topics are not used as guidelines.

5.3.1 Strategic alliances

The Japanese way of production is unique and one might think that it is due to the culture and the Japanese law. Much has been said about keiretsu or cross-share holding as one of the reasons for successful partnerships, though, Toyota has shown that their system works abroad e.g. US and Europe with non-Japanese suppliers which makes it interesting compared to a European view.

It was clear from the beginning that a successful partnership only could be established when the right level of trust, mutual understanding and development is present between the two companies. Within the Toyota, a relationship is more than familiarity – it is a matter of truly understanding each others businesses, and working with Toyota is seen as a way of improving the business from the suppliers' point of view. Liker & Meier (2006) mentions, that Toyota sees their suppliers as an extension of the technical capabilities or assembly line. Their waste is also Toyotas waste, why it is important to work together to eliminate as much as possible. Furthermore, Liker & Meier (2006) presents the following model (the figure underneath), which is a good description of the aspects of the TPS approach.

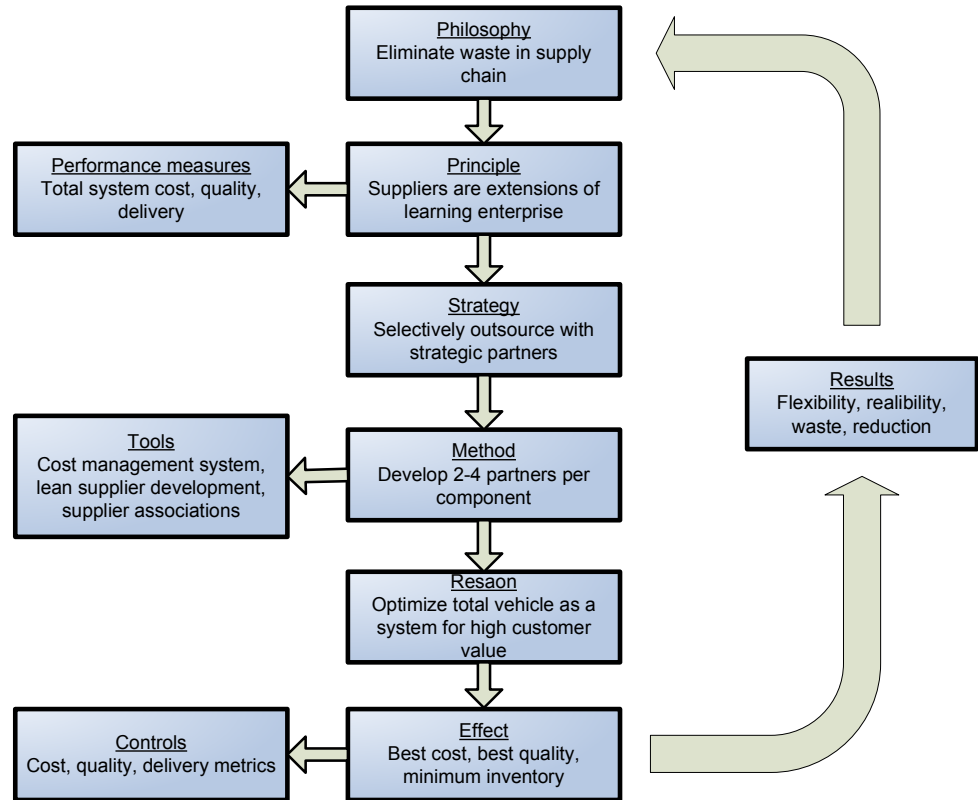


Figure 57 – Toyota’s approach to reduce waste (adopted from Liker & Meier, p.116)



A common understanding of the importance of a short lead time and high productivity is necessary and looked at as extremely important though, Toyota does not force their suppliers to follow the TPS concept. It is their choice and as long as they live up to the agreements, Toyota does not interfere, but they are aware of the importance of spreading out the TPS concept to the supply chain. Overseas this is done by picking parts up at the suppliers frequently and thereby suggesting them to produce to meet the pick-up schedule. In most cases the suppliers continue to produce in large lots but eventually they notice that frequently pick-up does not fit with producing in large lots and a part of the foundation for adopting TPS is created. This is a typical illustration of how Toyota approach and work with their suppliers, and employees for that sake – individual and organizational learning is extremely important, mentioned by Mr. Tanaka (TMC interview, 2006).

Toyotas approach to location of the suppliers

The frequently pick-up is a fundamental part of JIT and makes location very important for the logistics. In Japan the suppliers are responsible for the delivery and the costs of it. This stimulates them to move closer to the assembly line, but lately it has been causing problems due to the traffic jams and the pollution. Right now, Toyota is revising their policy with regards to this issue by implementing cross docking as in the US. It is not Toyotas responsibility, but they know that it is important to be seen as “the thoughtful company”.

Figure 58 - The supplier approach (source: TMC interview, 2006)

5.3.1.1 Procedure for establishment



The impression of how Toyota works with their partners was very different from what we realized during the stay. One might think that Toyota has a well structured framework for entering a new alliance or working with them, but that is not the case. The procedure is a “case by case” procedure and nothing is fixed as one should think. Though, some phases continue from case to case which is interesting.

One way of integrating companies often used in the Japanese industry is throughout systematic buying of shares in the companies known as cross-shareholding. During the stay, we visited four of Toyotas suppliers, all of them connected to Toyota through shareholding and vice versa. This is one way of creating mutual understanding and trust between the two parties – though, it does not change the way how Toyota is handling the establishment.

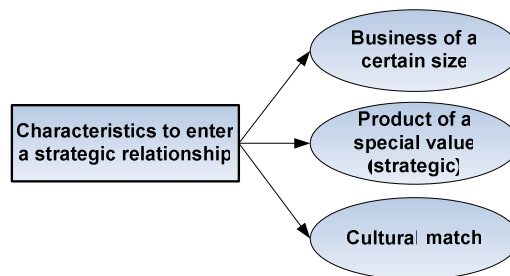


Figure 59 - Basic characteristics for a relationship (source: TMC interview, 2006)

As the figure above explains, there are some characteristics that have to be present and Toyota uses a lot of resources to assess these circumstances. The culture plays a significant role and one reason might be that trust is essential for Toyota (and other Japanese companies in general), why a relationship cannot be build overnight. Trust is seen as one side of the coin and effective control as the other – also mentioned by Liker & Meier (2006) and professor Kimura (Kimura, 2006).

Evaluation and learning

The continuously evaluation carried out in the purchase department is based on historical data and the relationship throughout time among other things. In most cases it is focusing on 1st tier suppliers but also on the rest of the business, and the result is companies for further investigation with regards to closer partnerships. In this case it should be mentioned that Toyota is aware of what is happening all the way upstream and they are very seriously about it, but expect that the 1st tier supplier takes care of the 2nd tier supplier and so on.

When Toyota and the collaborator are mature and ready for further development, an evaluation of the performance is carried out. Main focus is the production floor and manufacturing procedures and an important aspect is to understand that it is not seen as a test or exam, but more like the first of many opportunities for developing the relationship.

“This is the first opportunity to develop the competences of the supplier, and typically it is done through small 5S projects or other kaizen events”

Mr. Koda (TMC interview, 2006)



The keyword is learning-by-doing and a good illustration of one of the messages is: *See and observe the facts since discussions do not provide you with the solution.* During this process it is very important that the employees get involved and furthermore, that they create their own experience. This applies to both employees on the shop floor and the management. As Mr. Miura emphasizes:

“It is often about changing mindsets particularly within the management. Learning is a fundamental part and it enables to think beyond the given standards – thereby it is possible to evolve new and better standards, which is the basis of TPS”

Mr. Miura (TMC interview, 2006)

Learning is a never ending process always concentrated around the scene of act. During the establishment of the new alliance the learning process is often carried out with an OMCD consultant present. He works as a mentor and are able to manipulate the employees in a positive way in their search for the solutions. One can say that it is a way of preparing the supplier and the employees before entering the alliance.

Standards

“One cannot increase quality without standardizing – it is the fundamental idea of kaizen, a necessity to become better”

Mr. Miura (TMC interview, 2006)

Compared to Western countries, the Japanese view on standards are completely different. The Japanese employees consider standards as positive elements – it enables them to make the job correct each time, in the safest and fastest way. One standard exist until a new and better are developed, and that is why individual learning is essential – standards are made by the employees to the employees. Mr. Miura (TMC interview, 2006) points out that standardization is not difficult – each member has his or her own standard, and the issue is how to create a companywide method for securing good quality.

Contract

Even though many alliances within Toyota are characterized by long term relationship, trust and mutual understanding, they are still supported by written contracts. Its purpose and content is listed in the figure underneath.

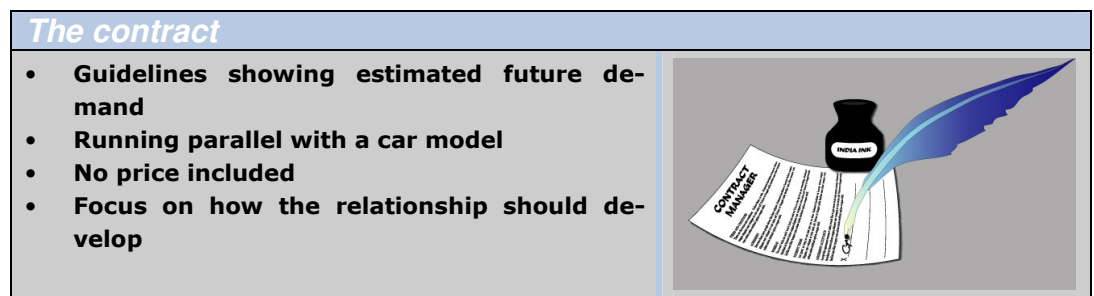


Figure 60 - Purpose and content of the contract (source: TMC interview, 2006)



Supply chain

Whenever new deals are being negotiated, Toyota always sees to it that there are at least two or three potential suppliers. Often the demand is spread out among different suppliers or simply insourced as Liker & Meier (2006) describe. This is known as one side of the coin and works as a part of the controlling element in the supply chain. It keeps the suppliers innovative and competitive and enables Toyota to control the power relations. Even though Toyota is a huge corporation, it is still working with major suppliers – the business is changing and e.g. electronic system plays a bigger and bigger role compared to earlier and whoever holds the development controls the supply chain (Liker & Meier, 2006). Toyota is aware of this element and TPS is not about playing the suppliers against each other. The suppliers are not used as buffers – they have a planning schedule and Toyota involves them in the heijunka process, see underneath:

Heijunka – product levelling

Toyota uses heijunka to level the internal (vertical) workload so it matches the capacity and external (horizontal) to level the deliveries (trucks). The concept is to create a steady demand both internal and external to make a smooth production.

Figure 61 - Heijunka at Toyota (source: TMC interview, 2006)

VSM

It was amazing to see how the production flow was illustrated. At Otics (one of the 1st tier suppliers) some kind of VSM (Material Information Flow Analysis (MIFA)) was used to map the material flow (see appendix D4 for an example of MIFA). They made it internal, sometimes with help from Toyota, and delivered it to Toyota who could use it in their production planning. Otics got their input from their 2nd tier suppliers and that was how extended VSM was created. In the end Toyota could put together an overall view of the supply chain and use it in the further work, see figure underneath. All this was taking care of by the purchase department who has the main responsibility for working with suppliers.

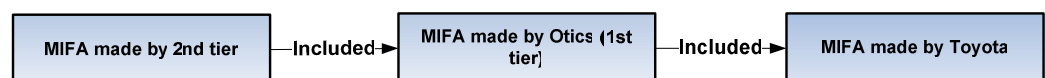


Figure 62 – Material Information Flow Analysis (MIFA) (source: TMC interview, 2006)

5.3.1.2 The daily work with strategic partners

The daily work is running smoothly without any participants of the supply chain interfering in each others work. This means that Toyota minds their own business and the same with regard to the suppliers. Though, this trust related issue is combined with an effective control and Toyota knows a lot about what is going on. The assessment in the purchasing department is an important element carried out in different ways depending on the suppliers (again the “case by case” concept). In this process Mr. Koda (TMC interview, 2006) points out:

“It is fundamental to understand that documentation is only documentation – communication is very important”.

Mr. Koda (TMC interview, 2006)

TOYOTA



By this he means that one cannot read everything in the reports. The communication process and the experiences from the scene of act are of at least same significance and have to be taken seriously. A lot can be learned just by observing, as long as one knows what to look for.

As in the establishment phase, the evaluation criteria are quality, cost, delivery, human relations etc. – last one very difficult to measure since judgment is subjective. New expectations are decided every year followed by targets for each supplier. These targets are compared to actual performance and if the model is good, then sourcing is increased. If the suppliers have already fulfilled the targets, new ones have to be defined. The other way around, if there is a lack somewhere, Toyota does not end the relationship. First step is to work with the supplier to become better together, which is one of the perspectives in a long term relationship. A lot of resources are already used combined with the mutually understanding and trust which are present, so it has to be a very critical issue if it has to end.

In many cases there is room for improvements in the supplier performance. This is not necessarily a conclusion from the yearly assessment, but can be pointed out by the supplier. One example could be a newly raised problem in the production, where the supplier asks the Toyota consultants for help.

Facts about the consultants

- **Free of charge! (a minimum service charge is taken)**
- **Only support if Toyota thinks it will pay back (but always if it is a question of delivery or not)**
- **Toyota supports as long as needed – two years not unrealistic.**
- **Used to enhance the learning organisation**



Figure 63 - Facts about OMCD consultants (source: TMC interview, 2006)

Another way of developing the learning organization is through exchange of employees between the supplier and Toyota. It happens often, that an employee from Toyota spends two or three years at e.g. Denso, first of all to develop experience but also to spread some of the principles behind TPS. This is seen as one of the best ways to learn from each other. An interesting example follows:

A professor as a trainee

Mr. Kawachi (one of our four contact persons) was sent to Toyota as a trainee for a six months period, with the purpose of learning TPS. Afterwards he shall return to his original occupation as a professor on a university. His knowledge and skills within operations management are extensive, but he needs a more thorough knowledge of TPS, why his university sent him to Toyota.



Figure 64 - A special case of job rotation (source: TMC interview, 2006)



Furthermore, job rotation is also used within Toyota between different departments. One example is Mr. Koda (from purchasing to OMCD), another is Mr. Otsu (from marketing to OMCD). Neither of them made the decision themselves – it came from their manager or the vice president.

Learning Groups

Parallel with the individual kaizen events at the suppliers, jishuken (learning groups) are established. It is another way of spreading knowledge in the supply chain and thought of as extremely important. Jishuken is an association of a representative from Toyota and a group of suppliers (often 6-8 suppliers) with common characteristics. All of them meet once a year, at an annual supplier meeting, with main purpose of selecting a theme in which improvements shall be made the following year. Productivity and quality are topics for discussion. The representatives from the suppliers depend on the theme, but could be a mix of employees from the shop floor, engineers or managers.

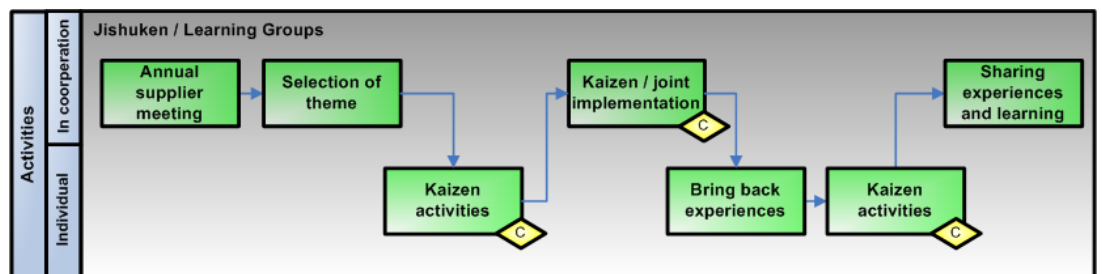


Figure 65 - The approach for jishuken (source: TMC interview, 2006)

The theme provides focus area and the basis for the following kaizen events, which takes place over the following six months usually, see the figure above. The first two months are used for preparation and making kaizen individually (some of the suppliers have to bring e.g. the facilities or production line up to speed). Afterwards the group is doing kaizen together at one of the supplier's plants (new supplier each year). The time frame is usually a couple of days up to a week. All the experience made during these two days are collected and compared with individually experience from each supplier, and an implementation plan is created. Third step is to implement "the solution", which is also made in collaboration. All participants are active during this phase, and it is their own responsibility to gather as much of experience and information as possible. Afterwards the group splits up and the suppliers go back and implement the solution at their own facilities. Often additionally kaizen events are needed, but the foundation and knowledge are created so it should be manageable. Last step is the subsequent meeting where the group shares individual experience and discuss different problems. This is the way of following up and perhaps one of the most important steps.

Toyota has a lot of different learning groups, all of them creating a small part of the huge network. Working with jishuken is important and the suppliers take it very seriously (see also Dyer & Hatch, 2004 and Liker & Choi, 2004 for a description of jishuken).

5.4 NEC Personal Products



The Visit took place the 4th of December at their Yonezawa Plant in Yamagata Prefecture north of Tokyo. Compared with the previous visit at Toyota this was very different. It is another kind of business – electronics compared with automobiles – and NEC is a big player in their field but small compared to Toyota (revenue). The time at NEC was limited and the outcome was expected to be smaller, though, it was very interesting to see this type of business because it creates a good perspective to the system at Toyota.

NEC – Nippon Electronic Company was established in 1899 (www.nec.com). It started out as production, sale and maintenance of telephones and switching systems and today the main products are home and business computers, printers, software, tape storages and business appliances. This line of business is very tough and NEC experience both seasonal and daily fluctuations. It is a kind of unique market trend and speed is the key to stay in business. Furthermore, the life cycle is becoming shorter and shorter parallel with significant component price erosion, why supply demand balancing also is a key element to success.

This evolution was the main reason for introducing TPS in NEC six years ago and it has helped them a lot with performance, especially in the production. The system used at NEC is the original TPS introduced by a Toyota consultant – all levels in the production are covered. The same consultant covered more than 20 of NEC's plants, started out with two or three visits every month at each plant, now he is there once every third month.


<i>Use of consultancy at NEC</i>	
<p>NEC has worked with TPS for 6 years. During this time they have had a Toyota consultant with great experience in TPS attached during the entire process.</p> <p>One of the biggest tasks for the consultant has been to keep telling that it is possible – by saying the same things. After a long time NEC started to actually <i>understand</i> the things being said – it took a great amount of time to reach that point.</p>	

Figure 66 - Use of consultancy at NEC (source: NEC interview, 2006)

Strategic Alliances in NEC

NEC benchmark their development with Toyota, who they see as the as the mature state – the ideal picture of how the production system can be developed. Compared to Toyota NEC's experience with regard to alliances is relatively small. At this moment they have two suppliers whom they work very close with, but not in same degree as Toyota. Mr. Sawamura (NEC interview, 2007) says that this field is very complicated because many part suppliers are bigger companies with higher bargaining power. Toyota is used to be the biggest fish, for NEC it is a bit different.

NEC's attempt to develop an alliance with Intel

One of the first attempts to create an alliance was a big fiasco due too the fact that NEC choose the wrong partner. In the analysis their findings told them that Intel were an important supplier why they should focus on them. After the initial work they had to give up because Intel would not work on the same conditions as NEC. NEC tried to improve the relationship and create new changes but Intel would not yield. NEC's influence was too little and Intel did not really care if they were in business with them or not.

Figure 67 - NEC's experience with Intel (source: NEC interview, 2006)



The starting point is a bill of material analyzing the products with regards to subparts and components. Afterwards these are divided e.g. according to geographically location, experience with TPS, the amount of the purchase, trust and familiarity to NEC and so on, cf. the following figure This Bill Of Material (BOM) splits up the suppliers in different pools and an important message is to start with the easiest suppliers.

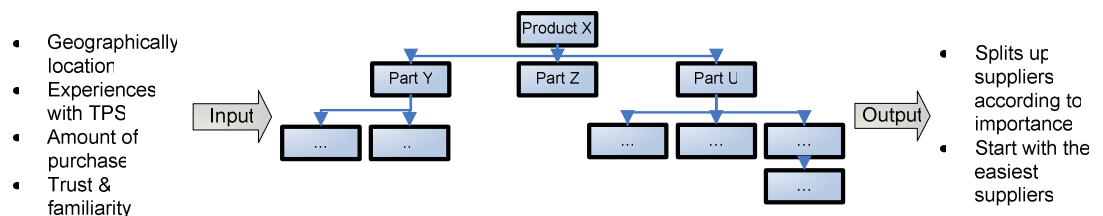


Figure 68 - Typical BOM (source: NEC interview, 2006)

Sharing benefits

The initiation will most likely include external consulting (Toyota) so the issue of sharing the benefit is a bit different compared to Toyota. Usually they evaluate the cost of the relationship and discuss how to do it afterwards. Still it is handled case by case – nothing is fixed.

Contract

The arrangement is defined in a basic contract without any special agreements. Some general issues can appear e.g. how to implement and work with kanbans. The result oriented goals are dynamic and will be changed when achieved, though Mr. Sawamura (NEC interview, 2006) points out that it is important that both sides have good conditions.

Jishuken

In the daily work Jishuken is used in the same way as by Toyota though limited to the two nearest companies. It is on a lower lever and NEC sees themselves as a young player and knows that there is a long way ahead of them.

Communication and meetings

The communication depends on the suppliers, though, regular meetings are held with many of the local suppliers – e.g. every 2nd or 3rd month. The topics are the general performance of the supply chain or relationship and how to improve the delivery to

NEC. Compared to Toyota the statistical background is another, prime measures are number of kanbans in flow, quality and operation efficiency.

5.5 Kawasaki Heavy Industries, Ltd



The Kawasaki visit took place two days after the NEC visit – the 6th of December. Compared to the previous visits, this was focusing a little bit different. Main purpose was to introduce us to the Kawasaki Production System (KPS) as another way of doing production – a way that the people at Kawasaki think is more flexible than TPS. The reason for this is that Kawasaki produces many kinds of products to many kinds of businesses e.g. aerospace, shipbuilding, consumer, energy among others. It requires a flexible method, one that they insist that KPS contains. Compared to Toyota the profile is completely another, which makes it difficult to talk about one particular model to approach the production system. The division targeted for our visit was the Akashi Plant in Osaka, where they produce motorbikes and smaller engines. It is one of the factories within the consumer products division and the production method used is mass production – much like Toyota. Unfortunately it was not possible to see how they worked with KPS in projects, which could have been very interesting.

KPS has been around since the 70's, first introduced at the Akashi Plant at the Motorbike assembly line. It was learned from Toyota's car production and next after Toyota; Kawasaki must be seen as one of the most experienced players, when talking about use of JIT production systems.

KPS is seen as a system to promote and accelerate kaizen improvements and kaizen is defined as problem solving. To the employees of Kawasaki problems mean that the situation is a bit off the standard, why one could say that KPS is a system that exposes problems. It is all about control and standards and Mr. Kido (Kawasaki interview, 2006) emphasizes that:

"it is not important to reduce inventory to zero – focus should be put on controlling inventory instead"

Mr. Kido (Kawasaki interview, 2006)

Mr. Kido's experiences with implementing KPS abroad tell him that Japanese engineers are required to make it work. For that reason they have Japanese managers on the motorcycle plant and construction plant in the US and they are doing as well as in Japan.

Supplier relationships

The supplier relationship depends on the division in question. The motorcycle division is very skilled due to the fact that they are heavily dependent on the daily deliveries just like Toyota. There is a good relationship between Kawasaki and the suppliers and Mr. Kido (Kawasaki interview, 2006) says that it is because Kawasaki always fills them in. Production plans with assurance of quantity are at disposal. Practically it is all about production levelling. The way that Kawasaki levels their production is crucial for their suppliers, and they are aware of that.


<i>Similarities between KPS and TPS</i>	
<ul style="list-style-type: none"> • Problem solving techniques as a foundation • Define and stick to standards • The essence of product levelling 	

Figure 69 - KPS and TPS (source: Kawasaki interview, 2006)

The continuous improvement of the relationship is taken care of by skilled people inside Kawasaki. They visit each supplier and help them with cost and value engineering. An important aspect is the learning organisation and Kawasaki focus a lot on this when teaching the suppliers. Furthermore, KPS specialists also visit subsidiaries and help them in their production – main goal is often cost reduction. The specialists always act on equal basis no matter if the companies in question are suppliers or subsidiaries. They do it fairly, logically, rationally and it is important that the employees or suppliers do not get any bad experiences. The continuous teaching is supported with a rotation system between the major subsidiaries. The best employees are picked out and transferred to Kawasaki temporarily to learn KPS on the spot.

5.6 Denso

DENSO Denso is one of Toyota's main suppliers of Toyota. They have been dealing with them for many years and the relationship is well developed. Denso produces and develops many of the electronic components in the Toyota vehicles and particularly electronics play a bigger and bigger role. This makes the visit very interesting especially to investigate the relationship between the two companies. The visit took place the 14th of December at their Daian Plant in Nagoya. This was the fourth visit at a Toyota supplier, but the first one arranged after the Toyota visit.

Production system

Basically Denso follows the same production methods as Toyotas, still based on JIT and jidoka. They call it Denso Production System (DPS) and they have been working with almost as long as Toyota. During the plant tour one got the same impression as at the other Japanese companies – Kanban makes up the internal system and it works very well. Denso's manufacturing policy (monozukuri) focus on quality and safety as the two main parameters, hence the slogan is:

"Quality and safety are the keys to a good defence"

Denso' manufacturing policy slogan (source: Denso interview, 2006)

Quality is obtained when the customer reject rate is "zero", but the safety issue is a little bit different. It is there to create a good environment, but one hidden agenda is of course the efficiency that follows. As mentioned before, standards is one way of creating a safe environment but also a way of creating high efficiency. During the introduction, cost was barely mentioned. Denso addresses this area in a very simple way – minimize cost by surpassing the competitors' manufacturing technology!

Relationship with Toyota

As mentioned, the relationship with Toyota is very close. This is very clear when observing the information flow. The close information sharing is very important and it starts in the early stage of the product development process – and it goes both ways. Still a contract is made when the two companies starts on a new business or a new product development process. Often the time frame is until the product is developed or the car model is replaced.

Relationship with suppliers

The daily work with the suppliers follows the same pattern as at Toyota – the suppliers are left alone as long as they fulfil the goals set up in the contract. The quality assurance department is taking care of the relationship – quality and delivery are the two main aspects when checking the suppliers. Many of them are doing well and a lot is done to fulfil the targets. The competition between suppliers is huge and many would like to work with Denso because it is a sign of prestige.

When working with the suppliers, cost is the 2nd priority – quality comes first. It seems a little bit strange compared to the Japanese way of doing production, but the main reason for this is the quality problems in the electronic business. Right now Denso cannot afford to change focus away from quality – it makes up the competitive advantage and as long as the quality is fluctuating, it will be this way. For that reason VSM is not used extensively in the context of the suppliers. It does not make that much sense.

Spreading the concept

The DPS is the responsibility of the individual plant, a bit like inside Toyota. New ideas are shared on a gathering held two or three times a year. 300 – 400 employees participate at these events. When starting a new plant, a Japanese manager will assist the process until the production system is running perfectly. In this period the local staff is send to Japan to learn about the production system and to look around at the Japanese production facilities. They return to their plant and start to improve accompanied by the Japanese manager. It is yet another example of the concept – “go see the facts”.

5.7 Hitachi



Hitachi was the fifth and last company targeted for visit during our stay in Japan. The facility called Hitachi PERL is located in Yokohama with hard drives as the main product. The demand for hard drives is very fluctuating and furthermore, the yield is very fluctuating, why one of the biggest challenges on this facility is to combine these two parameters. This was the focus area for our visit – discussing methods for combining this problem, though it is a bit off direction compared to our field of interest.

To us it is uncertain how their production system works since it was not possible to see the production itself. It seems like they have not adopted TPS to the same degree as the other companies, but they could not explain it why we cannot conclude too much.



Working with suppliers

The PERL facility is in the same situation as Denso and NEC, discussed previously. Both are in the electronic industry, which is characterized as a market with fluctuating demand and yield. This means that one cannot be certain how much to sell next period and at the same time it is unsure how high the quality of the purchased components is.

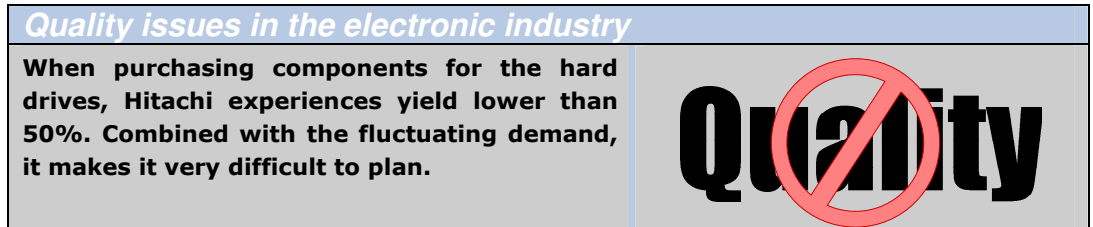


Figure 70 - Problems regarding quality (source: Hitachi interview, 2006)

This problem changes the focus from a cost view to a focus on the quality. It is far more important to get the right volume with the right quality, than earning a penny more (or yen) per piece. The quality issue makes it naturally for Hitachi to work closely with their suppliers, and it is done with a wide range of them.

The kind of relationship depends on the strategic importance of the product and Hitachi splits up their suppliers due to importance of the purchase. Sometimes the suppliers are stronger than Hitachi, e.g. Intel, and in this case it is extremely important to use multi-sourcing to keep the right power base – competition between two suppliers helps motivating the relationship. Furthermore, it is a good way of levelling the production. If the demand is fluctuating, it is possible to use one supplier as a buffer and meanwhile the other as main supplier.

Third reason (as seen from the following figure), with out talking delivery into account, is the positive influence on product development. Two companies competing against each other create more innovative solutions and technologies. This is an important aspect especially in the electronic industry.

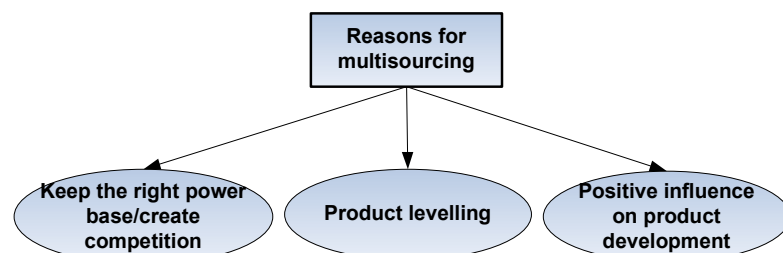


Figure 71 - Reasons for multi sourcing (source: Hitachi interview, 2006)

Contract

When beginning a new relationship a contract is signed. This is not a standard contract, but tailor-made for the single case. Main purpose is to dictate common rules and of course some demand targets for the future. Furthermore, different terms of delivery and quality are dictated to align the expectations of the two companies. In the last ten years, key component suppliers have been making good money due to their power base, why it is an area Hitachi management pays a lot of attention to.

Sharing of knowledge

To keep up with the development and to keep learning, success stories are shared among all sites within Hitachi, no matter if it involves supplier related information. This is mostly done through different meetings between management in the corporation, but still it reminds one of the other Japanese companies. When new methods are developed, it is the company policy to use the same approach at all plants. That is why manufacturing sites are visited at regular intervals to evaluate and modify the technology if necessary.

5.8 Part conclusion

It has been eight very interesting visits during the stay in Japan, and it is our belief that we have gathered a good impression of how the Japanese companies act. Compared to the companies from the Danish fieldwork and those we know from other contexts, it is obviously that the “Japanese way” is unique, especially Toyota’s. The TPS spirit lies within most people we have met; it is impressive and remarkable to see how they work.

Comparing the Japanese companies

An important message is that not every Japanese company performs as well as Toyota. Toyota has developed their system throughout the last sixty years; it has been a tough journey with a lot of fundamental learning. Compared to the rest of the Japanese companies Toyota is unique, only Denso’s and Kawasaki’s production systems are developed to the same degree. Kawasaki points out that their production system is more flexible due to the fact that they are working in many different businesses. From our perspective the difference is not that big – KPS is developed during the 1970’s with the help from Toyota’s consultants.

In fact, seven out of the eight Japanese companies have adopted their production system from Toyota by learning from internal or external consultants. It is remarkable and indicates that TPS is a special concept.

TPS philosophy

The visit at Toyota gave a deeper insight into their production system, than one can read from the books, and it was possible to come up with our perception of what makes TPS unique. It can be seen in the figure underneath:

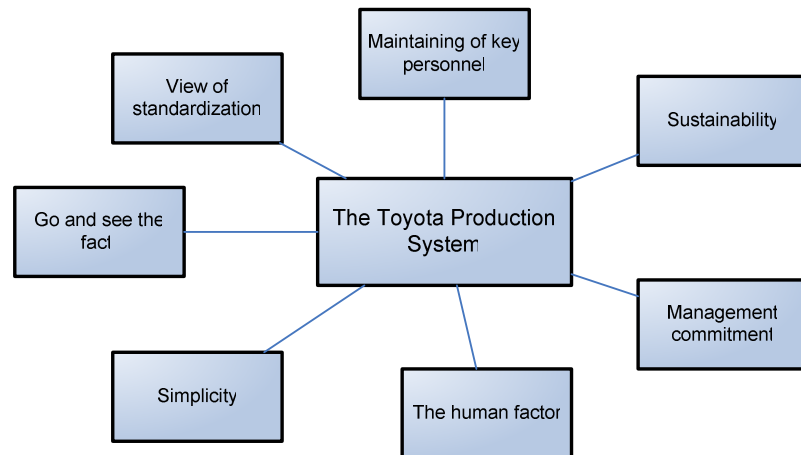


Figure 72 - The elements of TPS as we see it

When reading the theory many of these impressions are clarified, but it is our belief that they are not emphasized enough. Terms like “Go and see the fact” and “Simplicity” are more valuable to the concept compared to the impression that one gets from reading the theory. In this context, we would like to draw attention towards the movie made up of impressions from Japan (attached to the project). It shows some of the cultural differences that exist in Japan.

Respect for people

A lot of conclusions can be linked to the Japanese fieldwork – many of them familiar to the western mindset. One is that focus must be placed on the value adding work, why workers are an important focus area. The Toyota people mentioned that only workers produce value (strictly logical) – they are the people driving the innovation of the company and the supply chain, why their well-being is extremely important. One way of handling this is to consider all downstream processes in the company as your customers and do your best to make their job easy and enjoyable. It is a simple way of creating a comfortable work environment and very important.

Strategic alliances

The advices from the Japanese companies were simple and clear. When starting a strategic alliance it is important that the focal company chooses a supplier who is easy to work with. The word ‘easy’ covers a supplier to whom your business is important, one that has the same development within Lean (or can be developed easily) and one that has the courage and passionate mind to start the process. This does not necessarily mean that you have to choose your biggest supplier. NEC made this mistake when trying to develop a relationship with Intel.

One way of getting an overview of the suppliers, is to make a BOM with regards to Lean development, geography, value of business etc. NEC uses this approach because it makes a clear overview in a simple and fast way.

The use of external consultants (in Japan we think of Toyota consultants) is a great help when working with strategic alliances. As mentioned by NEC and Kawasaki: experienced eyes from outside the company often have another approach and way of addressing the situation, why it is an important element of the development.

Part 6 COMPARING JAPAN & DENMARK

This part compares Japan and Denmark with regards to both the industry and the national culture. Differences are important to take into account when transferring the principles from Japan to Denmark, since it might create obstacles towards a successful implementation.

After analyzing both the Danish and Japanese conditions this comparison is possible to make.

CONTENT

- 6.1 INTRODUCTION
 - 6.2 THEORY
 - 6.3 THE INDUSTRY
 - 6.4 NATIONAL CULTURE
 - 6.5 PART CONCLUSION
-

6.1 Introduction

Going to Japan has not only given us a unique possibility to study Japanese companies including Toyota, but also the chance to see how everyday life in Japan is like. In this way it is possible to make comparisons between Denmark and Japan in terms of both the industry and the national culture. The comparisons have been divided as follows:

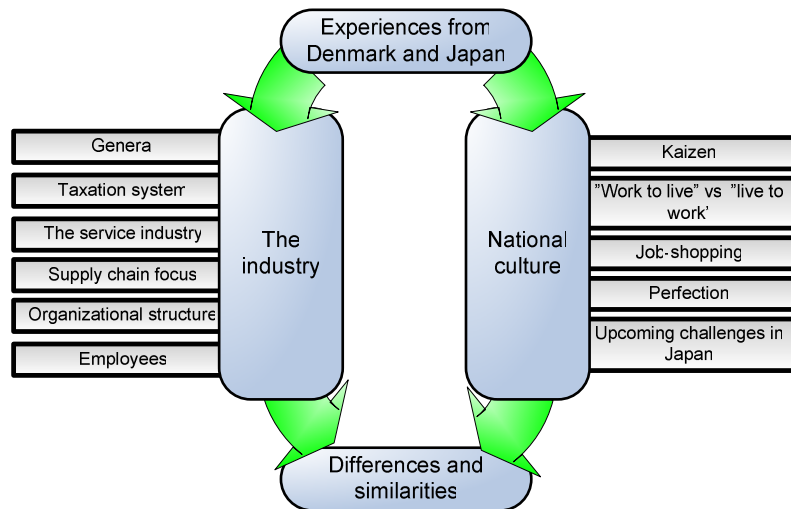


Figure 73 - Experiences from Denmark and Japan

Differences and similarities are pointed out in order to evaluate the impact of culture on companies' ability to work with strategic alliances and supplier associations. The observations have been supported by literature, but the main issue has been the experiences – of which some cannot easily be read about in books.

6.2 Theory

The national culture is very interesting to look at, because many see the culture in Japan as a reason for the success of TPS. It is important to know the set of values and fundamentals held by the people, to understand how they react in different situations. There exist a number of different models for analysing national culture (Brooks, 2003). Geert Hofstede is seen as the expert on cross-cultural analysis and his model will be used in the following (see also Hofstede, 1983).

Originally, Geert Hofstede used four cultural dimensions but a fifth dimension was added later, for countries with a Confucian background (Brooks, 2003):

<i>Cultural dimension</i>	<i>Description</i>
Power distance (PDI)	The social distance between people of different rank or position
Individualism (IDV)	The extent to which an individual relies on a group (a collectivist approach) or takes individual initiative in making decisions, solving problems and engaging in productive activity
Uncertainty avoidance (UAI)	Reflects people’s attitudes to ambiguity in a society or country
Masculinity (MAS)	Reflects values which are widely considered to be more “masculine”, such as assertiveness competitiveness and result orientation, whereas “feminine” values can be seen to be cooperative and to show greater awareness of feelings and equal opportunities
Long term orientation (LTO)	Values of long term: thrift and perseverance Values of short term: respect for tradition, fulfilling social obligations, and protecting one's 'face'

Figure 74 - Hofstede's five dimension (adopted from Brooks, 2003 and www.geert-hofstede.com)

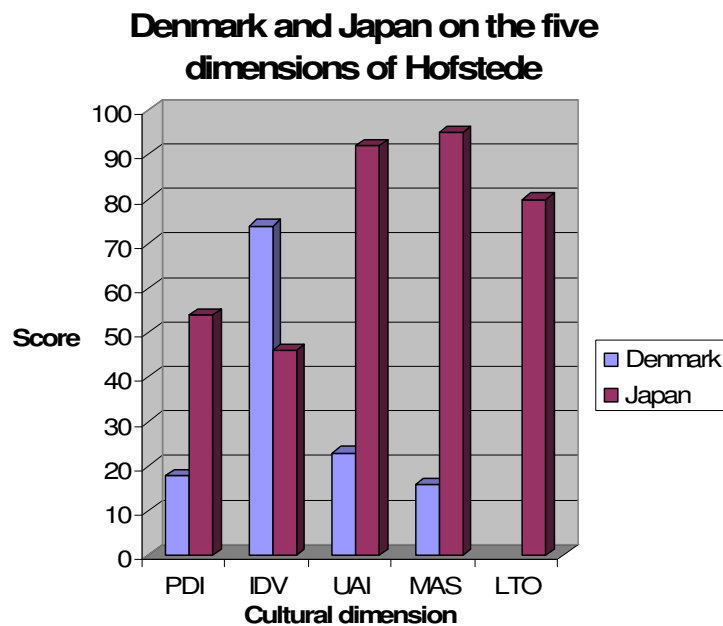


Figure 75 - Denmark and Japan on the five dimensions of Hofstede (source: Brooks, 2003 and www.geert-hofstede.com)

As seen from the figure above Denmark and Japan are quite different.

Power distance (PDI)

The gap between subordinates and superiors in Denmark is low, saying that the communication between them is characterized by dialogue and agreements. Also, people are very independent. In Japan the employees instead look for directions from their superiors and there is a lot of respect for authorities.

Individualism (IDV)

This is the dimension with the smallest difference, but still it is significant. The score in Japan tells that people rely on relationships in key groups or family instead of themselves, and they are afraid of losing face. In Denmark relationships between people are looser and privacy is valued higher.

Uncertainty avoidance (UAI)

The big difference in score tells that Japanese people are happier with written rules, laws and policies to cover every situation. Furthermore, they value job security, whereas Danish people are more willing to take risks.

Masculinity (MAS)

This dimension has the biggest difference in score – and Japan the biggest score among all countries in the survey. In Japan the values of men and women are very different and there is a high level of discrimination in the organisation. The very low score in Denmark indicates that conflicts in the working environment are solved by compromises and negotiations.

Long term orientation (LTO)

This shows that Japan has a long-term perspective, which explains the Japanese strong work ethics. Also, it explains the wish for long-term relationships with suppliers.

In the following analysis of the industry and national culture, the analysis will be used to support the findings.

6.3 The industry

A comparison of Japan and Denmark has been made:

<i>Dimension</i>	<i>Japan</i>	<i>Denmark</i>
Economical		
• Service	69%	75%
• Industry	24%	20%
• Agriculture	7%	5%
• GDP (per inhabitant)	US\$ 28.000	US\$ 29.000
Employment by size of manufacturing enterprises (number of employees)		
• Less than 10	50,9%	71,4%
• 10-19	22,7%	11,7%
• 20-49	16,5%	9,4%
• 50-249	8,5%	6,0%
• 249+	1,4%	1,5%
Value added by size of manufacturing enterprises (number of employees)		
• Less than 10	5,2%	6,4%
• 10-19	6,9%	5,4%
• 20-49	12,5%	10,8%
• 50-249	29,2%	24,4%
• 249+	46,2%	53,0%
Research and development expenditures (% of GDP)	3,2%	2,6%
Organizational structure	Flat, high power distance	Flat, short power distance
Employees	Highly educated, look for directions	Highly educated, independent
Working hours per year	1789	1540
Labour productivity (GDP per working hour)		
• 2005	36	43
• 2001-2005 (average increase)	2,1%	1,7%
Effective marginal tax for higher wage earners	39%	63%

Table 1 - Comparing the industry in Japan and Denmark (source: OECD, 2006; DI, 2006; Martin & Olds, 2004; Jensen, P., 2006 and Jensen, H., 2006)

6.3.1 General

Japan is the world's second largest industrialised economy. They are leading within production of automobiles, ships and electronics (Martin & Olds, 2004) and the big enterprises play an important role. In Denmark the companies first of all make spe-

cialised and often very advanced products, and there are only a few very large companies. Denmark does not belong to the mass producing countries, but as seen from the table above, the structures of the industries are very similar. It is the big companies that produce most of the value. Japan is often cited for its huge amount of technological and scientific resources (Martin & Olds, 2004), but Denmark is also doing well. A lot of money is spend to increase the technological level (DI, 2006).

6.3.2 Taxation system

Denmark has a marginal rate of taxation on 63% for the people with a higher salary (if consumption taxes are included almost 75%) (DI, 2006). Furthermore, Denmark is the country within OECD, where the top tax sets in earliest. A Japanese employee is allowed to earn nine times as much as a Danish employee before the top tax sets in (DI, 2006). This has to do with the comprehensive welfare system (Martin, 2003) and the huge public sector in Denmark, in which more than a third of the workforce is employed (DI, 2006). This puts the private sector under a huge pressure, because two thirds of the employees are financing the services provided.

These facts have a huge impact on the number of hours that Danish employees are willing to put into work. Because of the progressive tax system there is no stimulus to work hard (more than demanded) which also reflects on annual working hours (see the table above). The Danish companies experience this as a barrier in the competition with foreign companies. The tax system also results in a limited desire to be an entrepreneur – the typical Danish employee is a wage earner (DI, 2006).

6.3.3 The service industry

As seen from the table above the service industry is big in both Japan and Denmark. But from our impressions in Japan, their service industry is very inefficient, and not at all comparable to Toyota. When visiting service institutions like hospitals, banks, the city hall, tourist agencies etc. we realized, that it is not a normal for a Japanese employee to think improvements.

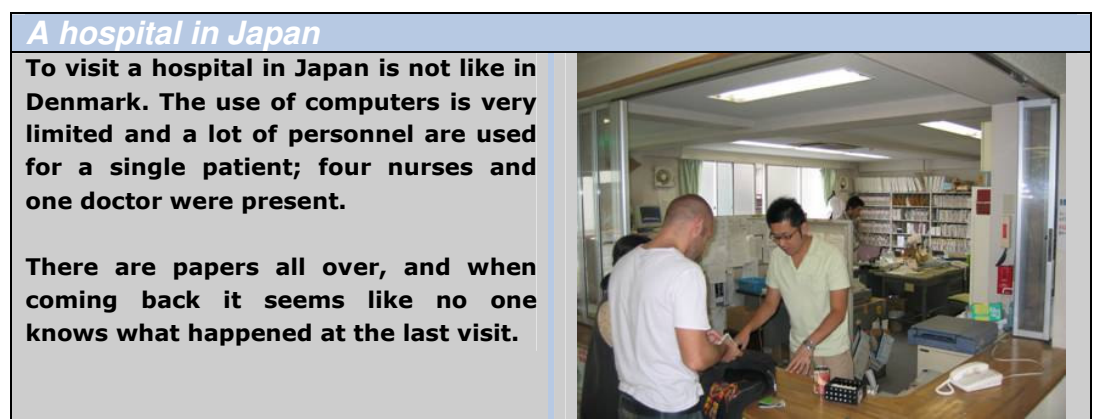


Figure 76 - A visit to a hospital (source: our stay in Japan)

Furthermore, the number of employees is huge. It seems like Denmark is doing much better in this area.

6.3.4 Supply chain focus

This area is treated separately because of the importance to our project.



<i>The West including Denmark</i>	<i>Japan</i>
<ul style="list-style-type: none"> • Internal and short term focus • Win-loose not necessarily bad • Strategic alliances not seen as a major strategic weapon • Competition rather than cooperation 	<ul style="list-style-type: none"> • Focus on the entire value stream • Tradition for close relationships with suppliers • Human relations are very important 

Figure 77 - Supply chain focus in the West including Denmark and Japan (source: fieldwork in Japan; Lamming, 1996; Milgate, 2001 and Womack & Jones, 2003)

The West including Denmark

Lamming (1996) argues that focus of supply chain management historical has been internal and on the short term implications of supply. Stages between internal processes rather than between companies have prevailed, and optimization of individual benefits within a market-driven context has shadowed the goals of the company as a whole.

In the context of this project purchasing criteria in Denmark is often limited to focus on price, reliability, delivery and lead time (Danish interviews, 2006). Organizations are afraid of being dependent on suppliers and win-loose situations resulting in partner exposure, are not necessarily seen as a bad thing. This point of view is supported by Milgate (2001). He points out that western managers do not see alliances as a major strategic weapon, and that competition is fostered rather than cooperation.

Japan

The conditions in Japan are another story. Japan is known for its co-operation between the industry and the government (Martin & Olds, 2004). Feudal traditions of obligation and government policy have resulted in focus on the needs of the entire value stream rather than on individuals (Womack & Jones, 1994). Furthermore, Japanese keiretsu makes management want to cooperate with others on all levels (Milgate, 2001). Close relationships is a natural part of running the business and the view is long term.

There is great emphasis on the human relations involved in a relationship. Purchasing selects suppliers on a wide spectrum of criteria including attitude towards the relationship and human relations (TMC interview, 2006) – all in agreement with Milgate (2001).

6.3.5 Organizational structure

The organizational structure in Denmark is flat and there is a very short distance of power (Jensen, P., 2006; Jensen, H., 2006 and in agreement with the Hofstede analysis). A consequence of this is the authority among the foremen on the workplace – it is relative big and for that reason the autonomy compared to e.g. high placed managers in US companies is almost the same (Jensen, 2006). Moreover, collaboration be-

tween employees and managers are common used e.g. through the use of different committees and representatives within the companies.

The structure in Japan is also rather flat and the jump in salary between bottom and top is not that big (TMC interview, 2006). But there is a high power distance and the employees prefer specific directions from their superiors (in agreement with the Hofstede analysis). Another difference pointed out by Milgate (2001) is that Japanese organizations are more effective at organizational learning, which may be a result of the Japanese cultural influence of people and organizations being ashamed to seek help from outside (in agreement with the Hofstede analysis).

6.3.6 Employees

The level of education in Denmark is very high (OECD, 2006). The culture on the workplaces is characterized as a workmen culture, that is, most of the employees are skilled (Jensen, P., 2006; Jensen, H., 2006). There is a high delegation of responsibilities to the employees, which is possible because of the high education level (in agreement with the Hofstede analysis). The employees have a high standard of competences and qualifications. They only need special training in complicated cases.

Japan is often cited for the high work ethic and the high level of education among employees (Martin & Olds, 2004). Toyota often draws attention to the importance of having qualified employees to make TPS work; it is important to use both brain and hands (pointed out by Michelsen, 2006). When comparing Japan and Denmark, both countries have similar labour productivities.

6.4 National culture

This part focus mostly on the Japanese national culture and emphasis has been given to our own experiences from Japan.

6.4.1 Kaizen

Michelsen (2006) points out that kaizen is not rooted in special Japanese patterns or culture. It was known and used in the US in the 1940s but the Japanese companies have been very good at adopting and improving the concept. The real difference lies in the way Japanese companies are working with improvements – see the figure underneath:

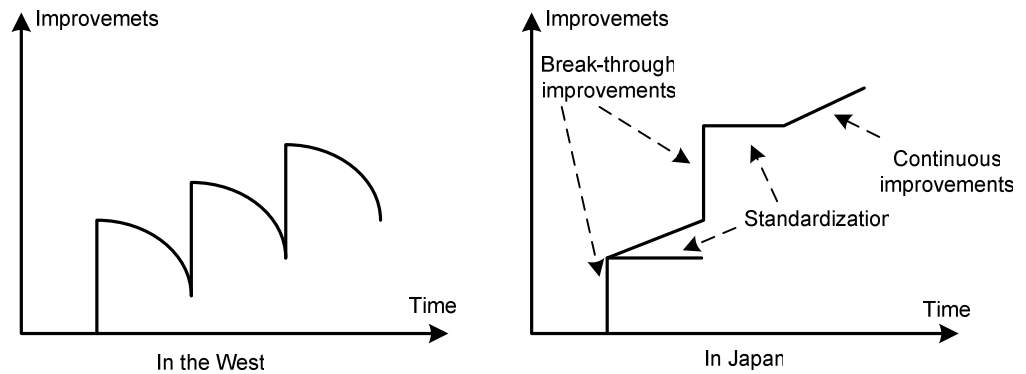


Figure 78 - The use of improvements in the West and in Japan (adopted from Michelsen, (?) s.15)

As evident from the Hofstede analysis, Japanese employees prefer to follow rules, policies etc. in their work, which makes it easier to accept standards. But actually, Danish companies have good conditions for working with kaizen since workers are very skilled, think independently and come up with improvements if they see some. It is, though, important to change the negative view towards standards.

6.4.2 “Work to live” vs. “live to work”

The degree of challenge in the job is viewed differently in Denmark and Japan. The honour of having a job means more for a Japanese employee than the content of the job, whereas a Danish employees often demand a challenging job (based on own experiences).

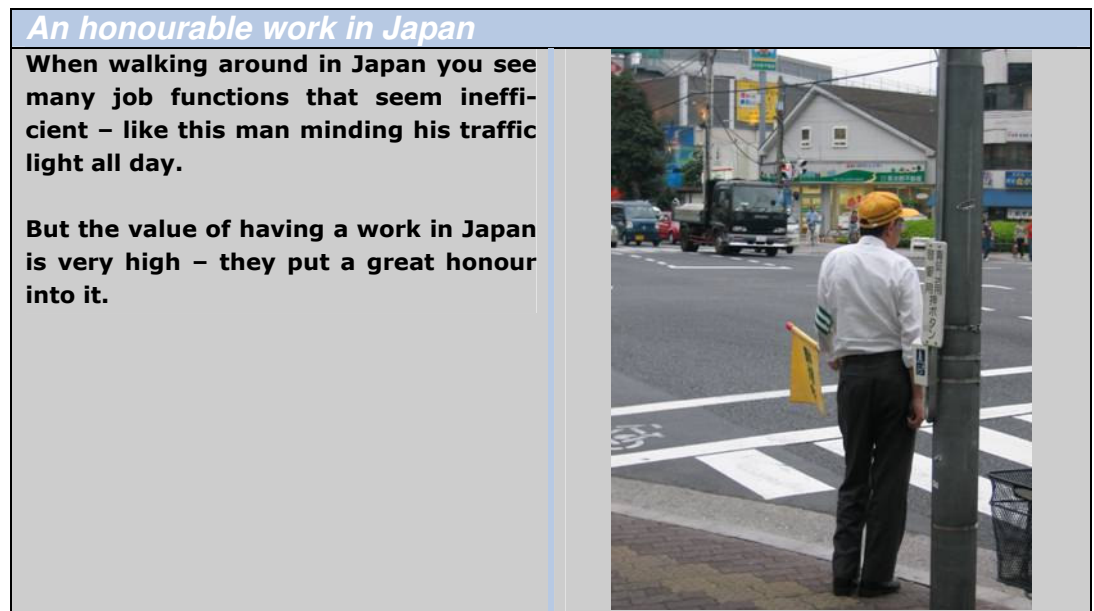


Figure 79 - An honourable work in Japan (source: our stay in Japan)

On the other hand, the increased challenges in the job are the main motivators for promotions in Toyota. There are only 5-6 grades of salary between the shop floor and the general manager (TMC interview, 2006). This actually indicates that the difference in wishing a challenging job might not be that great after all.

Japanese employees put many hours into their work, but not necessarily efficient hours (own experiences from Japan). They are often measured on time and not efficiency, which is very different from Denmark. But one important conclusion should be made here. Despite what many people think of Japanese working hours, using their spare time for kaizen activities, this is not true in the case of Toyota. The average working day at Toyota consist of eight hours Monday to Friday as in Denmark. The difference is the use of overtime and temporary workers. Each day can be scheduled with 45 min. overtime regulated by government (TMC interview, 2006).

6.4.3 Job-shopping

The number of years spend in one company differs a great deal as seen from the following table (in agreement with the Hofstede analysis).

<i>Tenure (%)</i>	<i>Japan</i>	<i>Denmark</i>
Less than two years	22,6	36,5
2-5 years	13,9	16,2
5-20 years	20,7	18,2
10-20 years	21,5	17,7
20+ years	21,4	11,4
Average (years)	11,3	7,9

Table 2 - Employee tenure in Japan and Denmark (OECD, 1997)

This was also experienced at all of the companies visited in Japan. In this way many employees have a thorough knowledge about the company, and almost all managers have experienced the shop floor at some point in their career.

In Denmark the job shopping seems like a problem (Jensen, H., 2006). The Danish employees often change job and company, because their educational level makes it possible. The single company has to be careful not to invest too much in one human being.

6.4.4 Perfection

Two evident differences are the respect between people and the degree of vandalism and violence. The Japanese are very respectful towards each other and think less selfish than Danes which might provide a better breeding ground for working in teams. But this does not necessarily result in effective teamwork. In terms of vandalism and violence you rarely see this anywhere – Japan is one of the safest countries in the world.

<i>Parameter</i>	<i>Japan</i>	<i>Denmark</i>
Population victimised at least one	0.1 %	1.1 %
Prison population (Number per 100.000 population)	39,3	42,9

Table 3 - Population victimised and Prison population in Japan and Denmark (OECD, 2006)

From our everyday life in Japan we have experienced a nation that seems to be very concerned about perfection. Rules are very important and strictly followed – e.g. peo-

ple would never overtake in a queue (in agreement with the Hofstede analysis). Also, everything must be carried out to the letter, and there is a lot of attention to details – e.g. in wrapping presents and how people dress.

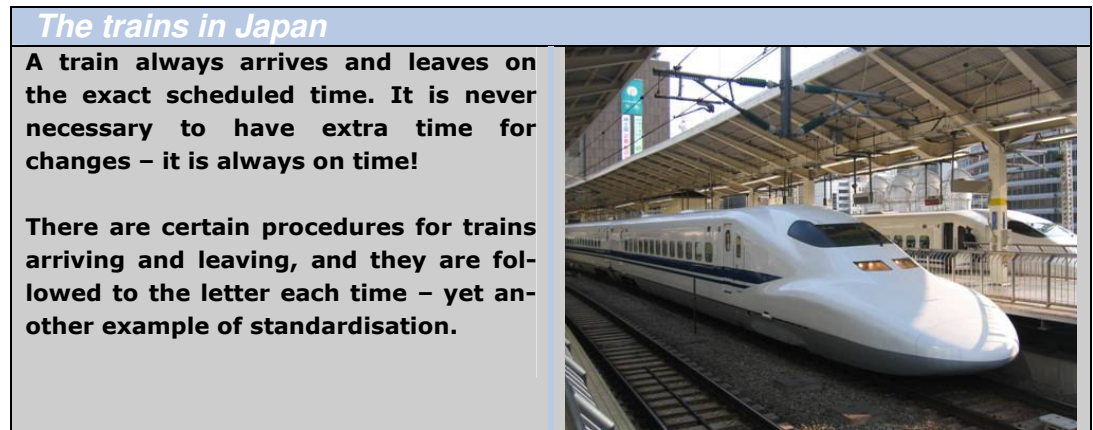


Figure 80 - Trains on Time (Shinkansen)

6.4.5 Upcoming challenges in Japan

Travelling in Japan also shows a country of contrasts. Especially the young people in Tokyo are different and they value other things compared to the older generation – Professor Kimura (Kimura, 2006) supported our experiences. The young people are to a lesser extent prepared to work many hours, and the preference for working for only one company is also decreasing. The changes are happening slowly but it will create challenges for the Japanese companies. The regulation of overtime by government is a good example of the changes.



Figure 81 - A new generation in Japan

6.5 Part conclusion

Michelsen (2006) points out that JIT has been seen as not doable in the West because of too big differences in culture, religion, working hours and low salaries. We believe that some of these perceptions still exist to some extent creating obstacles towards Lean and therefore strategic alliances as well.

As evident from the discussion above, there are a number of differences between Japan and Denmark. The question is whether these differences are of major importance,

and how much they influence the possibilities for a company to do a good job. Japanese people are e.g. drawn to perfection, and their work with standards is natural. From our point of view, it is important to realize the differences but not necessarily see them as limitations. The Danish companies have an advantage in highly educated employees capable of thinking creative solutions, and taking control over difficult situations. There is in other words a good basis for working with improvements.

The conclusions made from the service industry show that the Japanese efficiency does not necessarily have its background in the culture. We strongly believe that the real difference lies within the framework that Toyota uses and puts up for their employees – and not in the Japanese culture. A lot of them are temporarily workers without thorough knowledge of TPS. This is not a problem partly because of the standardised work. But also, no one is making wrong decisions – it is about addressing the right decisions to the right competencies and simultaneously supporting the employees in thinking in the right way (TMC interview, 2006). They make everybody work towards the same overall goals, not interfering with individual optimization.

As we see it, it is a question of changing the attitudes of the top management and create the necessary focus towards the importance of close long term relationships. The participating Danish consultants agree on this. TPS is said to work against human nature (Mr. Miura, TMC interview, 2006) and therefore passionate people are required. The smaller degree of job-shopping in Japan is an advantage because of the importance of maintaining key personnel. But it does not mean that the Danish companies cannot overcome it.

The differences and similarities have been summed up in the figure below:

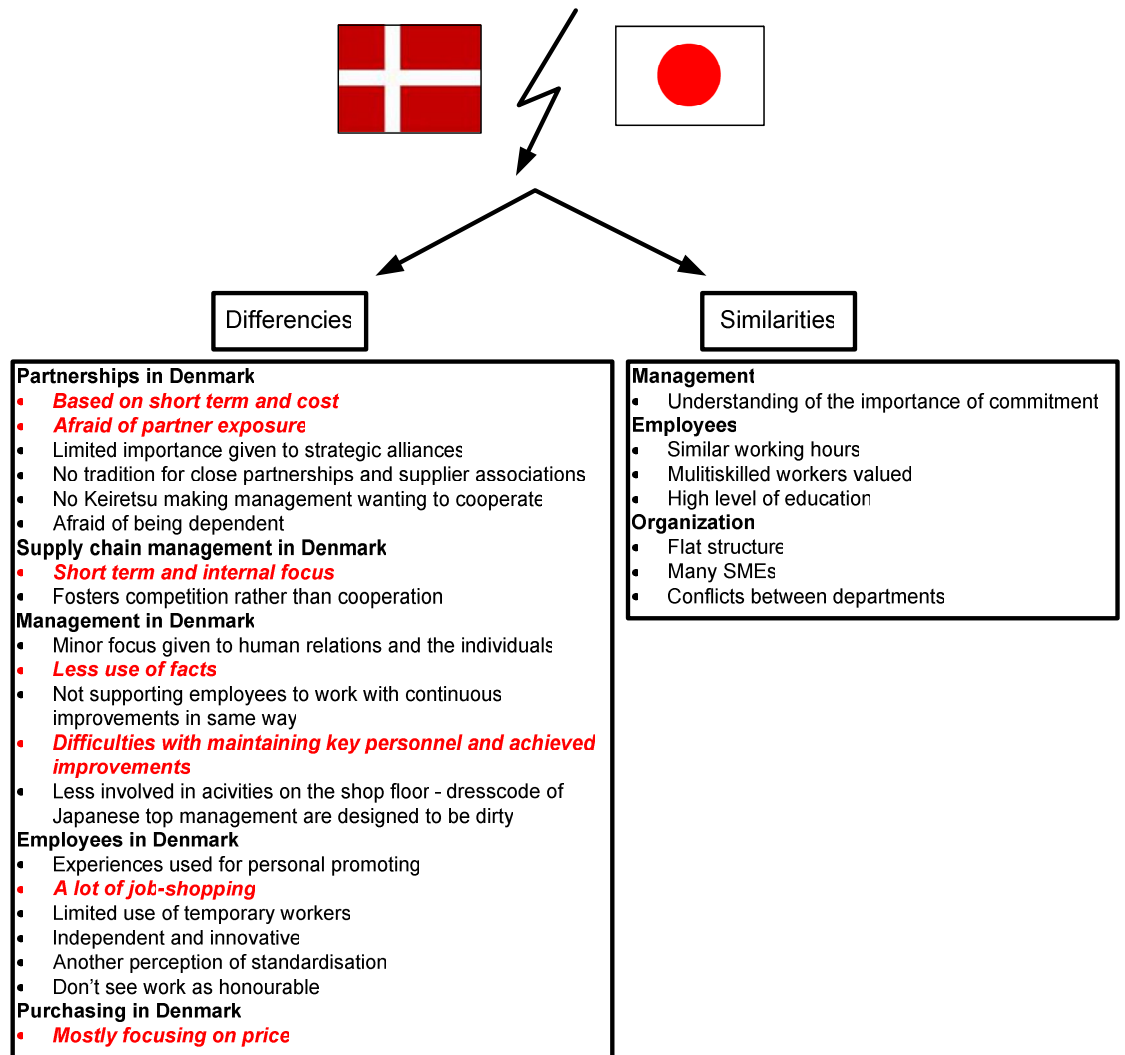


Figure 82 - Denmark vs. Japan - differences and similarities

Some of the characteristics are more important than others when transferring the principles to Denmark, because they create some limitations towards close partnerships. These are highlighted with red in the figure above.

We believe that these differences are not too big to overcome, if the right amount of attention is created. Toyota has many years of experience, and knows how much it takes to make strategic alliances work. Our procedure will help to overcome the differences, and create the needed focus on strategic alliances.

Part 7 FIELDWORK IN BRUSSELS

The visit to Toyota Motor Europe (TME) in Brussels was a unique possibility to discuss our proposed procedure for entering a strategic alliance. TME is the European Headquarters who among other things take care of suppliers in Europe.

The procedure was used as a starting point for discussion. From the visit we have had a possibility to compare Toyota's work in Japan and Europe, and thereby conclude on the influence of culture.

CONTENT

- 7.1 INTRODUCTION
 - 7.2 METHOD
 - 7.3 TPS IN EUROPE
 - 7.4 WORKING WITH SUPPLIERS IN PURCHASING
 - 7.5 PART CONCLUSION
 - 7.6 CONCLUSION ON THEORY AND FIELDWORK
-

7.1 Introduction

This part of the project is an extension of the framework set up in the beginning. The visit at TME was established by Professor Kimura during our stay in Japan. It was a great opportunity to build on top of the experience from Japan.

7.2 Method

The stay was planned in Denmark as a two day trip – first day with General Manager Jonathan Ballard from Operations Management Development Department (OMDD), who could explain the European approach to TPS. He has worked together with Mr. Miura (General Manager in OMCD, Japan), who as earlier mentioned is the successor of Taichi Ohno. The examination of the European TPS is very familiar to the Japanese approach, why it is not interesting to explain it in depth (see Part 2 – Lean theory for details on TPS). Only similarities and differences will be brought out. Focus is put on the experiences from purchasing department who deals with suppliers.

Our procedure was discussed with purchasing. Seven lectures were given with discussion in between by two General Managers. It was interesting and the focus was very relevant with topics as: “Overview of the supplier selection process”, “Roles & Responsibilities working with suppliers”, “Business expectations to supplier” and so on (see the agenda for the visit in appendix G3). At the end of the day there was opportunity for Q&A with Mark Adams, Purchasing Division Senior General Manager. All together a very interesting scenario for us as students – it is amazing what kind of resources they have put into it.

The procedure was used as a basis for discussion. Material was sent beforehand outlining the project (see appendix G1 and G2). As in the case in Japan no structured set of questions were developed. Rather, questions were formed as the discussion developed with the intent to cover all areas of the procedure.

7.3 TPS in Europe

The European TPS exists from TMC Japan and the two are almost identical regarding the philosophy itself but adaptations have been made to handle the European culture. The people in Brussels in charge of spreading out the concept have all of them been in Japan several times and learned from the Japanese experts. Mr. Ballard's approach to explain TPS was very similar to the one experienced in Japan and one can say that they have been successful in adopting it overseas. In reality it is all about having the right people. They must be willing to learn and explore new areas constantly. That is the core of developing TPS, new learning and challenges are some of the reasons why people choose Toyota instead of e.g. Ford (TME interview, 2007).

Basically, the concept is focusing on safety as priority number one. It makes good sense compared to Japan. The employees are also the “customers” and their well-being drives the next area – quality. When the quality is fulfilled one can move on to the volume, extend until all the demand is settled. Sustainable growth comes naturally when cost is prioritized, cf. the following figure.

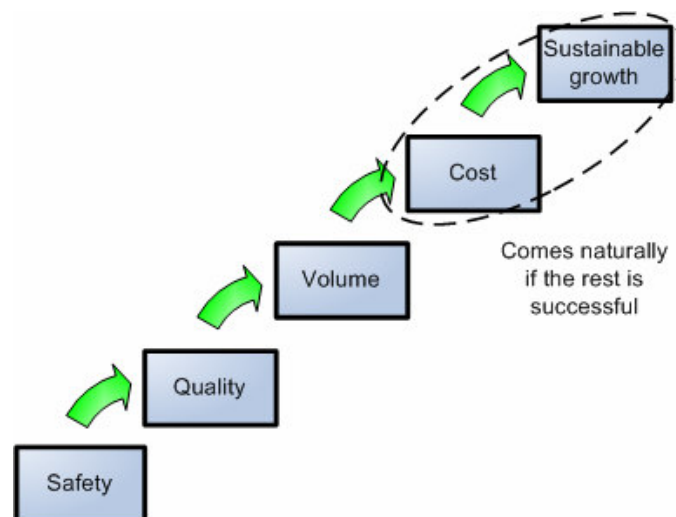


Figure 83 - Priorities within TPS (source: TME interview, 2007)

Internal consultant functions

One of the conclusions pointed out by Mr. Ballard was the importance of the internal consultant function. It must have high credibility internal and external and the department needs a certain amount of power. The suppliers must be aware of the effect of the department; Mr. Ballard describes OMDD as a very energetic department. The suppliers know that something will happen when OMDD visits them, and that is what is driving the success of the division.

See the fact

One of the main concepts within the Japanese problem solving method is: “Go and see the fact”. It is the same in TME, though they call it: “Study the process”. It is remarkable and funny to observe how much effort they put in this concept, it seems like one of the main differences between traditional European management (non Toyota) and Toyota’s management. The approach was explained by Mr. Barclay, cf. the following figure.

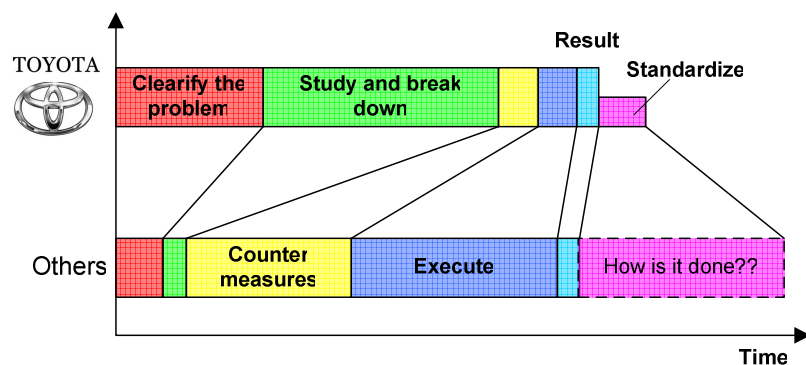


Figure 84 - Method for problem solving (source: TME interview, 2007)

The figure shows that Toyota put a big effort into clarify, study and breakdown of the problem, compared to traditional companies (this is their point of view). Afterwards it is relatively easy to make a countermeasure, execute it and standardize the result. The traditional way used by others is to make a quick study and instead impose several countermeasures until the problem is solved. In this way it is very difficult to standardize, why it is often doomed to fail. Toyota’s point is that it is worth the trouble to use the main part of the resources in the preface – “Study the process”.

7.4 Working with suppliers in purchasing

The purchase department within TME is taking care of the relationship with the suppliers. It is a part of their daily job and a lot of resources are put into making good long term conditions. The department is a unique setup – also compared to Japan – and it is our belief that a lot can be learned by investigating TME’s approach.

Organization of purchasing

The organization is very familiar to Western companies; in this case the interesting area is centred around Supplier Production Management (SPM). This is the division working deeply with the suppliers, developing them and making sure that everything is running smoothly. The division is divided in three departments with different roles and responsibility, see the figure underneath. This structure is very important and one of the reasons why TME is developing. Ford and Renault have adopted it in their organization during the last years.

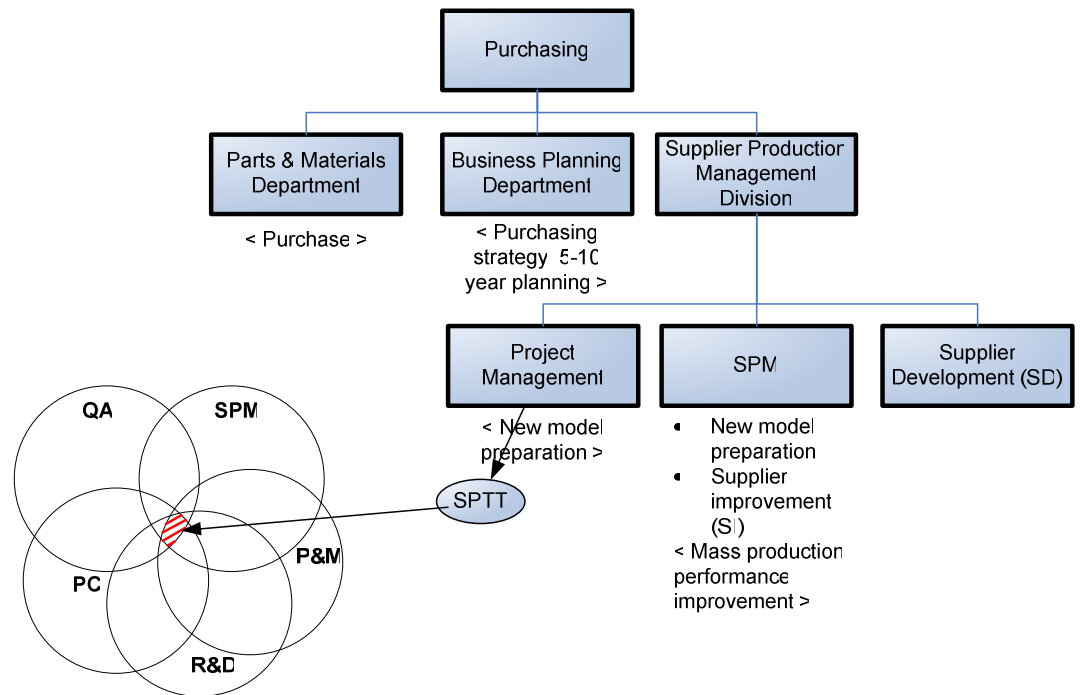


Figure 85 - Organization of purchasing department and the structure of SPTT (source: TME interview, 2007)

The Project Management department

Project Management department is taking care of the development of new models including preparation of the production system and the suppliers. Last-mentioned is handed over to Supplier Parts Tracking Team (SPTT) – a team composed of five departments within TME, cf. the following figure. Same structure exists at many of the suppliers’ organizations.

The daily work of SPTT is to prepare the production and the suppliers for new car models. It is a very difficult task that is spread over 3 years up until start of production (SOP). SPTT enters after the first year (SOP -2 years) and their job is to develop and standardize different processes at the suppliers’ facilities. It requires excellent engineering and technical skills – it is all about securing quality and a smooth transition when the mass production begins.

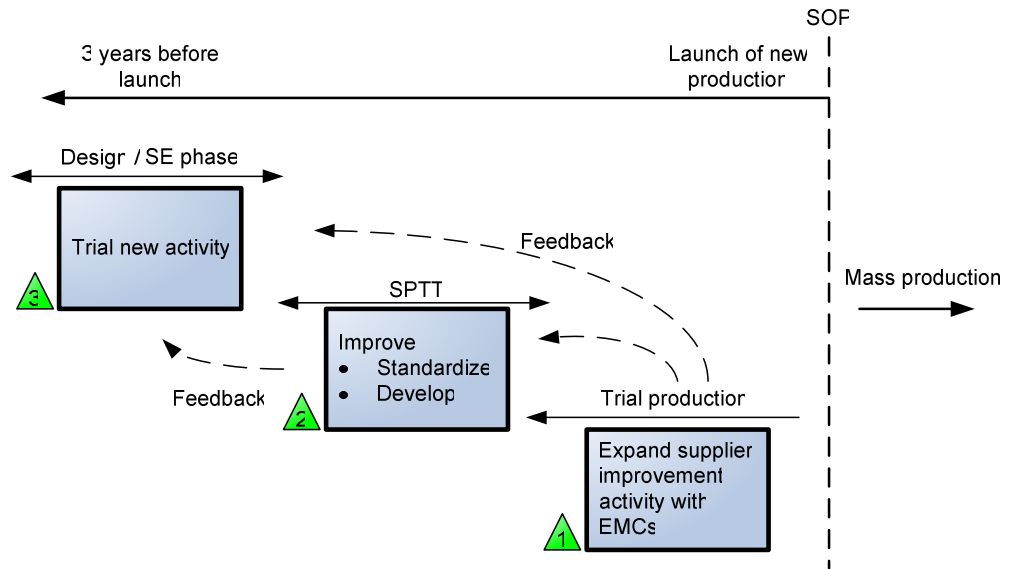


Figure 86 - Preparation of a new model launch (source: TME interview, 2007)

Each European manufacturing plant has this kind of arrangement and it is their own responsibility to work and develop the suppliers. This issue can create problems because many of the suppliers supply two or more manufacturing plants. One SPTT team may demand something special which can go against others. That is why the SPM division is coordinating the different SPTT teams and making sure that the same messages is delivered – “One voice to the suppliers”.

New model launch - Japan vs. Europe

One way of describing the development of TPS in Europe is by observing the procedure for new model launch. Mr. Barclay describes it in this figure. It shows that Japanese suppliers start on a higher level and finish faster which result in a SOP half a year earlier than Europe, cf. the following figure.

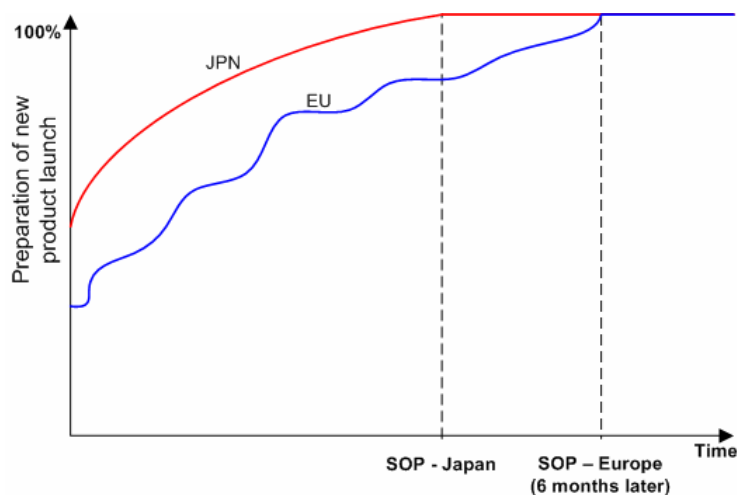


Figure 87 - New product launch - Japan vs. Europe (source: TME interview, 2007)

The Japanese suppliers are better at developing new processes and systems that fit into TPS which indicates the higher starting level. Furthermore, the following se-

quence is more steady – no stagnation or set-backs. In all its simplicity, this figure shows that TME and the European suppliers still have a lot to learn. Mr. Adams mentions their faster kaizen events as one of the reasons for this difference. It is driven from the shop floor and not top down as in TME.

SPM department and Supplier Improvement (SI) activities

The SPM department is also working with new model preparation and furthermore SI on a mass production level (after SOP). The suppliers targeted are found through performance monitoring. They are measured on two parameters continuously – Parts per Million (PPM) which is an indication of the quality level delivered from the supplier to Toyota and Delivery per Million (DPM) which describes the quantity, time, rightness and reliability of the delivery. These data are plotted in a matrix, see the figure underneath (random data are plotted). By observing the outcome of the matrix, one can figure out how well the single supplier is performing.

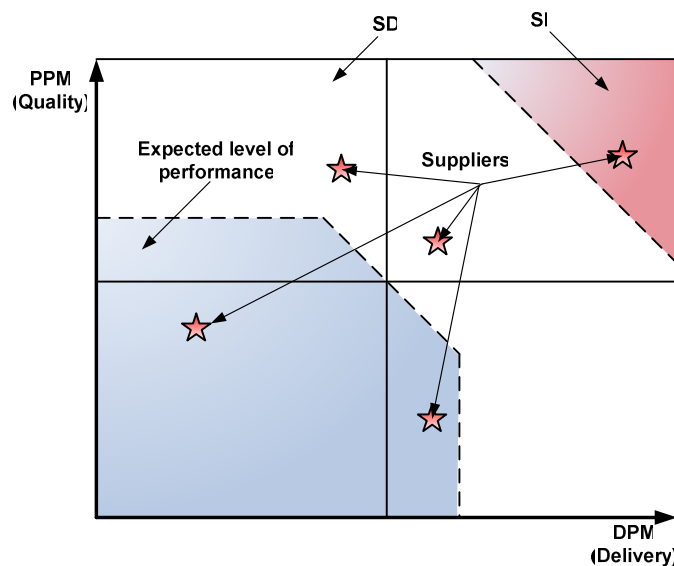


Figure 88 - Supplier performance matrix (source: TME interview, 2007)

The blue, white and red area have their characteristics, hence if a supplier is located in the blue area, the supplier is performing really well. In this case it is not necessary to help the supplier in the improvement process – they are self supportive.

Suppliers in the white area need help to improve but not critically. Toyota works with all of them to some extent. Mostly the work is characterized by help during execution of smaller project and guidance and recommendations during kaizen. They follow a fixed method for solving problems; cf. the next figure. Normally one SPM engineer (working with SI) is assigned to 12 – 14 companies. Normally the SPM engineer visit the supplier approximately one day each week – in this way he is able to help all of his companies through out the year. His daily work consists of helping them in the development process no matter if they are ready or not. Normally suppliers are happy to cooperate, because they know problems exist and that Toyota is able to help them.

The performance matrix is made each month which makes it possible for Toyota as well as the supplier to evaluate the progress. One important aspect when using this matrix is the time frame. If a supplier is unlucky and delivers to late at the manufactur-

ing site due to e.g. a car accident in which the supplier was without guilt, it will give a very bad indication on the matrix. In this situation it is not due to bad performance and the next months matrix will show that, why consistence is very important. Toyota is aware of that. Target is to develop all suppliers to deliver less than 15 PPM and 0 DPM.

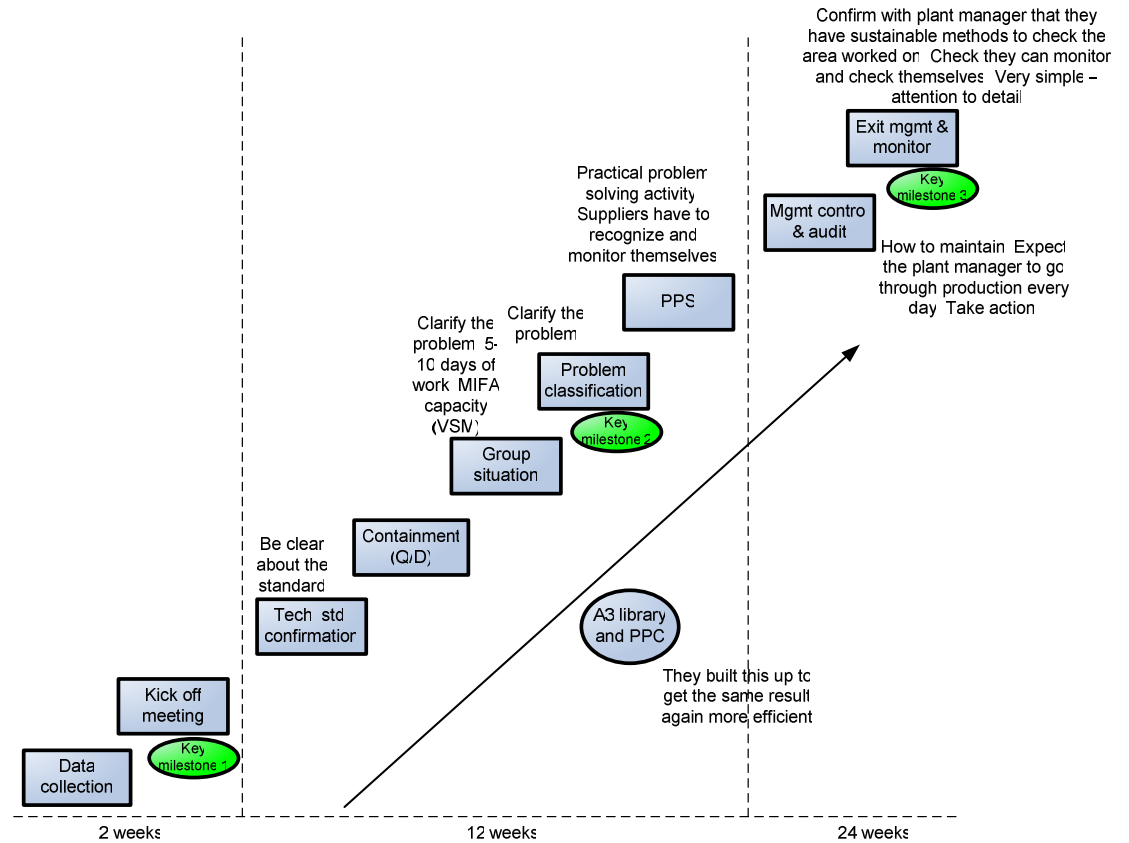


Figure 89 - SI activities (source: TME interview, 2007)

The activity follows the common procedure for problem solving within Toyota. First step is to gather information, next is to clarify the standards that has to be reached. The problems are investigated in several ways. One aspect is to develop a Material Information Flow Analysis (MIFA) – an analysis that remind of VSM in the Lean philosophy. Though, the employee within Toyota claims that this tool is much stronger – it was not possible to see the method, why we cannot judge it. The identification of the problem is replaced by a practical problem solving activity and in the end the solution is implemented and standards are developed. It is case by case, but approximately it takes six to nine months to improve and contain the improvements, when talking about one supplier.

Supplier Development (SD) activities

SD is taking care of basic development (the red area in the performance matrix) whereas SI focuses on improvement. To develop suppliers’ capabilities is very important and the high demands to PPM and DPM exist from the strategic suppliers who are delivering with high performance rates. Within Toyota SI and SD are two fundamentally different pools. The red part is the absolute worst performing suppliers and

they are chronic taken care of by SD. It is fundamentally management issues that are causing the problems and Toyota puts a lot of resources into developing them. The SD activity is taking place as in SI – almost same procedure – but the amount of resources is higher. Normally, it takes one SPM engineer one year fulltime to make the necessary changes. Of course this is beneficial to other customers of the supplier, but Toyota does not mind.

Objectives from purchasing

The car industry and its customers are driven by quality and this is also one of the main objectives from the purchase department. Get the best quality and furthermore, get it in a timely manner and at the lowest cost. Cost is emphasized and not price because it is the philosophy within Toyota that one cannot understand anything by looking at the price.

The price of a product consists of cost and profit, see the figure below, and if Toyota was told a price for a product, they would not be able to find out how much of this is cost and how much is profit. It could be that they had to pay too much for the product and opposite that the supplier tried to undersell the product to get Toyota as a permanent customer. Both coincidences should be avoided.

The cost focus (also referred to in the theory as target-pricing (Liker & Meier, 2006)) secures an open-book arrangement as Toyota wants it. Still it is based on fair competition, Toyota knows that the supplier has to earn money and once they have started a partnership, Toyota will do a lot to keep that supplier inside the supply chain. As a supplier of Toyota you will get the production for one car model (around five years) and the offer for the next model. You will not get dumped just because another company is cheaper. Instead Toyota tries to develop your capabilities and in this way the competitiveness.

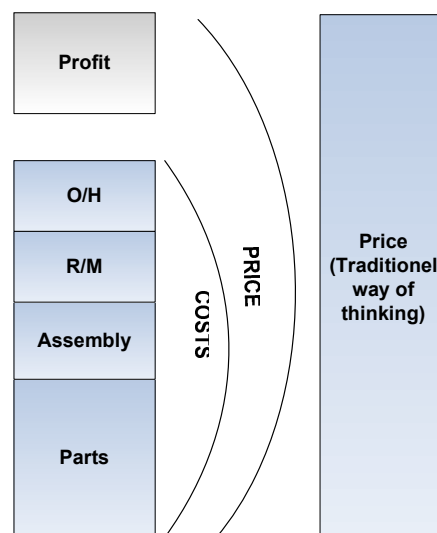


Figure 90 - Cost of a product (source: TME interview, 2007)

The open-book arrangement may seem strange to some extent because of supply exposure. A supplier may be frightened to open up due to fear of losing core competencies. Though, Toyota makes a big effort to stick to their role as an assembler and

not a producer. Furthermore, it is obvious that Toyota has been doing business in a good manner, hence, a lot of companies have worked with them for several years.

Dual Supplier relationships

A relationship with Toyota is very valuable due to the time frame and the effort that they put into it. To keep the supplier innovative and competitive compared to the market, Toyota uses dual or multi sourcing in the purchasing process. Each supplier knows how much they are going to produce and sell to Toyota during the next 1½ or 2 years, but the competition between the two suppliers prevents stagnation. Furthermore, it creates security if one of the suppliers should fail. In this case the other supplier is familiar with the product and production method, why an increase in demand is easier to switch around.

Right now it is difficult due to the fact that TME does not have the same volume as TMC, but it is one of their goals to develop a competitive environment through this approach.

Annual supplier meeting

As in Japan, TME holds an annual supplier meeting for all suppliers. Main reason is to create a kind of team spirit and of course to pass on their target areas. Again, it is about sending only one voice to suppliers. First point on the agenda is always: “what went wrong during the last year” – always the bad news first. Afterwards, they call attention to the positive elements. This is followed by upcoming targets, cf. the following figure, explained by the same figure each year. The overall goal is to create long term relationships with the suppliers. At the end of the day, the best suppliers are awarded. It is taken very seriously and there is a lot of prestige in being awarded.

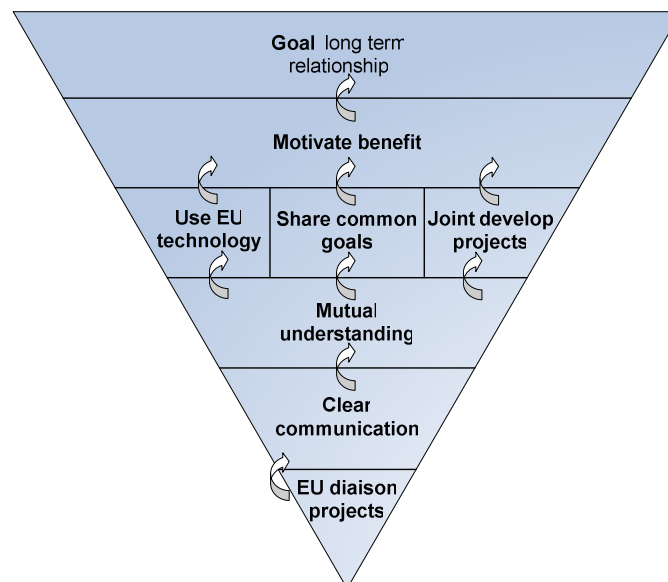


Figure 91 - Messages in the annual supplier meeting (source: TME interview, 2007)

Assessment

During the relationship each supplier is assessed continuously by the engineers. Right now, it is done twice a year but the aim is to do it at least every fourth month. The criteria are both quantitative and qualitative, cf. the next figure. It seems very complicated; hence, there are a lot of different groups and within each group a lot of lower groups with questions that has to be evaluated. It was not possible to describe the content of the lower groups, but when asking about the complexity, Mr. Barclay explained that this is not complicated. On a yearly basis they make an assessment even more thoroughly compared to this.

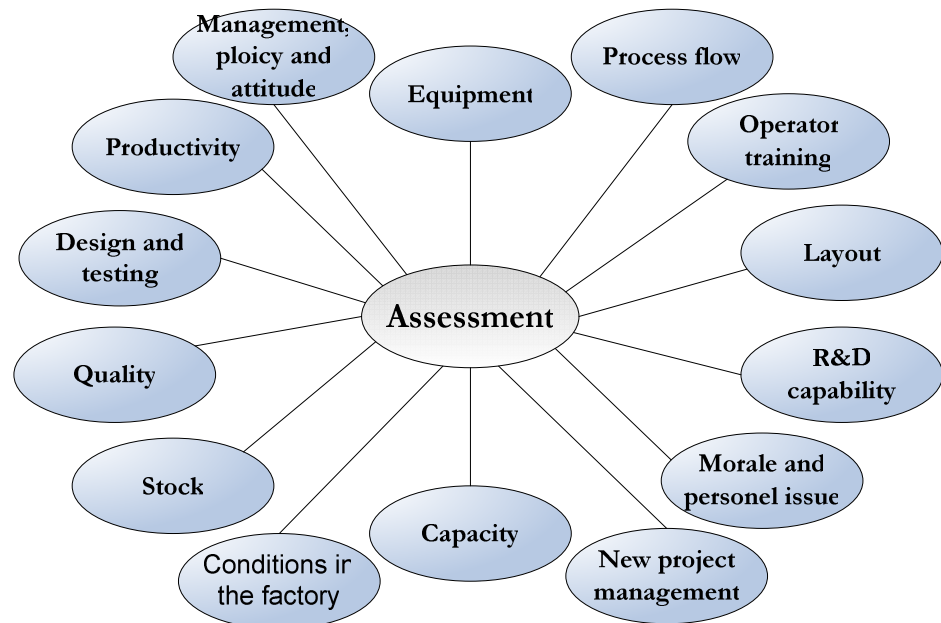


Figure 11 - Assessment criteria (source: TME interview, 2007)

Choosing suppliers

The process of choosing which suppliers to work closely together with is taken care of by the purchase department as well. All the suppliers are split up due to a Pareto analysis (Bicheno, 2004 suggests a Pareto-type analysis by cost and number of parts). In many companies a little percentage of the suppliers supply a big percentage of the parts – this is also the case within Toyota. These suppliers get most of the attention and they are measured on quality (PPM) and delivery (DPM). It is about getting a supplier with the right technical and human skills, last mentioned is qualitative evaluated. The selection process is finalized by making a document signed by all managers involved. This issue is well thought out – no one will get blamed if the relationship turns out to be a mistake. If it fails it is a mistake made by all managers and not only one. Furthermore, by making joint responsibility one hinders individual problem solving. Problem gets exposed right away which is very important.

Toyota Europe Association of Manufactures (TEAM) activity

Like in Japan, the European division has some gatherings for their suppliers very familiar to jishuken. It is called TEAM and main purpose of the organization is to make a social and economic contribution to develop together, and contribute to the overall targets. It is about developing individually and together – improve by seeing someone

with similar problems and then learn from it. The philosophy is that if you treat the supplier independently it may be hard to solve problems because you often need the help from other suppliers as well.

The TEAM association consists of 42 suppliers – those of a certain strategic importance. They are divided into 7 groups (one SPM engineer in each) and each group chooses one theme each year. Every month the group visit one of the members (supplier), discuss the chosen supplier's project, explains what the problem is and discuss how to solve it by using own expertise and experience. The SPM engineer is not the driving force, it is the suppliers themselves. He is just there to guide and assist if it is necessary and of course help them in using Toyotas problem solving method.

Many of the processes are alike the Japanese, but Mr. Shah points out that the European version of jishuken is slightly different in the relationship between the suppliers. They also use the group as a forum for discussion of general concerns not related to any particular industry – e.g. the rise of oil prices. This is not the case in Japan.

Contract

As in Japan, there is no kind of written standard contract between the supplier and Toyota. The one that is used is brief and simplified; it talks about the spirit of the business and dictates what to do if something wrong happens. Normally the contract runs for 5 – 10 years and even longer, why the price is never mentioned. The contract can be thought of as an agreement and nothing else. It does not have a great importance.

7.5 Part conclusion

The visit in Brussels was unique and very rewarding because the topics were clear and precise. It was interesting to experience how TME addresses problems because many of them are familiar to the Danish companies.

Finding problems

First of all TPS is about finding problems and solving them. Go and see the fact is brought out again and again. It is necessary to study the processes and understand them in depth in order to be able to work with them. Theoretical frameworks are not enough, and opinions have little value – it is important to value the things you see.

Problem solving techniques are highly emphasized and suppliers are assessed on their ability to solve problems. The message is clear, as Mr. Ballard explains:

"If you have a problem, go and see it. If you do not have problems it is simply because they are hidden!"

Mr. Ballard (TME interview, 2007)

Find problems, establish countermeasures, and introduce new standards are important and suppliers know things will improve whenever people from Toyota work with them. Still one must understand that TPS is expressed as the opposite of human nature, why passionate, skilled and continuous management is essential to succeed.

Cultural differences

Regarding the culture, there are some obstacles that have to be considered. One is the approach to cherry pick TPS whenever a small project is needed. The perception of TPS and what it stands for is not the same throughout Europe (TME interview, 2007); we experienced the same in our Danish fieldwork. It is a general misunderstanding that one can implement just a part of TPS, but of course it is not up to Toyota (or us) to decide what is wrong and what is right. When pushing it to extremes, Toyota is not even sure that TPS is the best solution. But it makes sense and history proves its value.

Standardisation

Mr. Ballard agreed that standardisation is viewed negatively in Europe but Toyota does not see it as a problem:

“If you really work with the employees, and show them that you care, they will understand and see the reason for following a standard”

Mr. Ballard (TME interview, 2007)

Respect for people is what it is all about. To give them a challenging job is respectful and there is nothing wrong in pushing them, because it develops them and creates enthusiasm (TME interview, 2007).

Job-shopping and management issues

One of the bigger issues in Europe is job-shopping (as TME sees it). It hinders organic learning and makes it difficult to maintain the objectives. But it is not perceived as a huge problem in TME. It is an obstacle that one has to accept, but it is possible to keep it to a minimum. It is all about challenging the employees continuously and develop their skills. In many companies higher salaries are used as the answer, but Toyota’s approach is educational. The employees within OMDD and other departments are challenged daily in everything they do. They do not get any routine assignments – instead they are pushed and pushed and that is motivating, as long as the targets are reachable. Furthermore, it includes job rotation – many of the employees in OMDD have worked other places in the organization just like in the Japanese approach. Job rotation strengthens the basic understanding of TPS and furthermore, genchi genbutsu comes naturally because the shop floor is familiar. Though, the lack of qualified people is a problem, mentioned by Mr. Worsfield. People demand more and more and are willing to give less and less.

7.5.1 Comparing TMC and TME

When comparing TME and TMC it is interesting to see that the two adoptions of TPS are very much alike. The employees have the same messages, the same things are said and it seem like Toyota is good at delivering only one voice to the suppliers. Furthermore, TME has proved that it is possible to use TPS in Europe, which is a milestone from our point of view.

Though, there are some differences between TME and TMC, mainly due to the fact that TMC has been working with TPS much longer. It is also obvious that the culture

in Europe is different, and that it has an effect on TPS and how the concept should be used (the differences are listed in the figure underneath).

<i>TME vs. TMC</i>	<i>Culture</i>
<ul style="list-style-type: none"> • TMC and TME are on two different stages on the TPS journey • Kaizen is top-down driven in Europe whereas Japan is bottom-up • Japan is faster at kaizen at the moment 	<ul style="list-style-type: none"> • Europe is cherry-picking • A lot of job-shopping in Europe – but not a huge problem • Negative view on standardisation not viewed as a problem in TME • Finding qualified people are a problem in Europe

Figure 92 - TMC vs. TME (source: TMC interview, 2006 and TMC interview, 2007)

The main conclusion is still, that TME shows that it is possible to adopt TPS in Europe. The difference as pointed out by Mr. Adams is:

“Japan and Europe are on two different stages on the journey, nothing else”

Mr. Adams (TME interview, 2007)

7.6 Conclusion on theory and fieldwork

To begin with, it should be mentioned that part of the theory is written on the basis of articles that investigate how Toyota is doing. As a consequence, there are many similarities between the theory and the fieldwork. Still it is very interesting to draw parallels on the basis of own experiences, and thereby have the opportunity to give a critical view on the investigation others have made of Toyota. A number of the important similarities as we see it, have been summarized in the figure below:

<i>Similarities between theory and fieldwork</i>	
<ul style="list-style-type: none"> • Importance of trust • Working on-site at each other • Joint problem solving • The importance of cooperation • Personal relationships and face-to-face communication are essential • Top management commitment • The important role of the purchasing department in dealing with suppliers 	<ul style="list-style-type: none"> • Focus on long term • Not <i>one</i> solution to strategic alliances • Importance of an alliance function • Strategic & cultural fit • Integrated business teams • Changes in the organisation is necessary • Continuous assessment

Figure 93 - Similarities between theory and fieldwork

The agreement of the time and resources needed to make it work should also be mentioned. Strategic alliances are not something that happens overnight!

7.6.1 Differences

The most interesting points to draw out are the following differences:

Problem solving approach – go see the fact

If there are no problems it is because they are hidden. Finding problems and establishing countermeasures by going and seeing the facts is a unique characteristic of TPS, which they also use in their strategic alliances. Discussions can only be made on basis of actual facts, so it is necessary to see them first. This must be taught to *everyone* through a practical approach which requires hard work. TME and TMC express this as *TPS is working against human nature*. (TMC interview, 2006 and TME interview, 2007). The theory does not talk about problem solving in this way.

Organizing – Consultancy

Both theory and Toyota agree upon the use of some kind of an alliance function. Alliances are said to be an unnatural organizational form (see Part 4 – Theory), and therefore they require a lot of attention and care. Toyota and the Japanese companies have a unique approach towards this. They have people with extremely high credibility dedicated to work with suppliers. The cost of their work cannot be justified on a daily basis, but they know how important it is. Compared to the theory it seems like Toyota put more resources into this function than normal.

Sharing the benefits

The suppliers' use of consultancy from Toyota is free of charge which creates an incentive to use it whenever needed. Furthermore, many short term cost reductions from kaizen activities are left entirely to the suppliers. The benefits and importance of having highly performing suppliers surpasses the cost of helping them to improve – and Toyota knows this. Of course Toyota requires lower prices as the supplier improves, but they do not let issues of sharing the benefits at the beginning of a relationship destroy a potential partnership. On this point theory talks about evaluating the cost and benefit of each change (see Part 4 – Theory), which seems more difficult than the approach used by Toyota.

To end a strategic alliance

Theory talks about what to be aware of, when wanting to end a strategic alliance, and actually it is included in the life cycle (see Part 4 – Theory). Ending a relationship in Japanese companies are not really seen as an option, which we think is healthy. Of course the suppliers must be kept competitive – and the relationship will be ended if they cannot perform – but it is seen as the very last option. Extensive help is given before reaching that point. This attitude helps secure the long term view, which is very essential.

The high number of similarities between theory and our fieldwork proves, that the things learned are applicable in Denmark too, as long as attention to critical areas is kept. It is our belief that the culture plays a smaller role in this connection (as argued in Part 6 – Comparing Japan & Denmark). What matters is the attitude of the management and the framework they put up for their business.

Part 8 THE PROCEDURE

Literature has been studied and Danish and Japanese companies have been investigated. Visiting Toyota in both Japan and Brussels has created a unique possibility to examine the influence of culture on their success. It has been concluded that it is their framework that matters, and the principles can therefore be used in the Danish companies as well.

This part deals with the application of the results in Denmark. This is done in the form of a proposed procedure for entering a strategic alliance. The identified differences between Japan and Denmark are dealt with, and an overview of the process is created. Critical areas are pointed out and possible tools on the way are explained.

CONTENT

- 8.1 INTRODUCTION
 - 8.2 PURPOSE, REQUIREMENTS, LIMITATIONS AND ASSUMPTIONS
 - 8.3 STRUCTURE
 - 8.4 INITIATION STATE
 - 8.5 DEVELOPMENT STATE
 - 8.6 MATURE STATE
 - 8.7 AREAS TO ADDRESS
 - 8.8 TIME AND RESOURCES
 - 8.9 PROFITS AND SHARING BENEFITS
 - 8.10 MANAGE DANISH CHARACTERISTICS
 - 8.11 PART CONCLUSION
-

8.1 Introduction

The impression when reading theory on the area of strategic alliances in a Lean context is that no general and concrete method or model is proposed. The many different variables in play and the heavy dependence are given as reasons why. Of course guidelines can be given (Part 4 – Theory) and best practices can be analyzed to get an idea of what needs to be done.

It is our wish to work with a procedure on a more specific level in order to answer questions related to *how* and not only *why*. Taking the Danish conditions into account narrows the area of application compared to a general procedure. There are of course still many limitations and obstacles related to the work, but we believe that it can be done. Additional, it is important to understand the purpose of our work. The procedure will not be definite, instead it should be seen as a possibility and of course a source of inspiration. We want to assist in the process of answering *how*-questions in the context of Danish conditions.

To combine best practices as read in the literature and seen through visits to Japanese companies, especially Toyota plays a great role. The week at Toyota accompanied by the four other visits gives a well-established foundation, and Toyota has a huge amount of experience throughout the world (see e.g. Dyer & Hatch, 2004 and Liker & Choi, 2004). Different tools and methodologies have been identified in Japan and Brussels, but also the fieldwork in Denmark has provided input – e.g. the tool used for choosing suppliers used by Company D. As seen from the following figure, the procedure is founded on the basis of three areas:

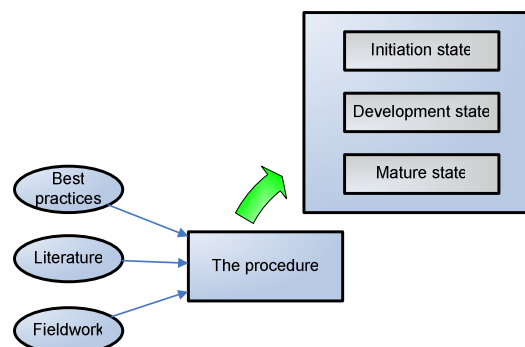


Figure 94 - Basis for the procedure

The procedure has been developed on behalf of three areas: best practices, literature and fieldwork (Japan and Brussels). Everything relevant has been outlined in Part 4 – Theory, Part 5 – Fieldwork in Japan and Part 7 – Fieldwork in Brussels and for that reason only a few references will be used here.

8.2 Purpose, requirements, limitations and assumptions

The purpose, requirements, limitations and assumptions of the procedure can be seen from the figure below:

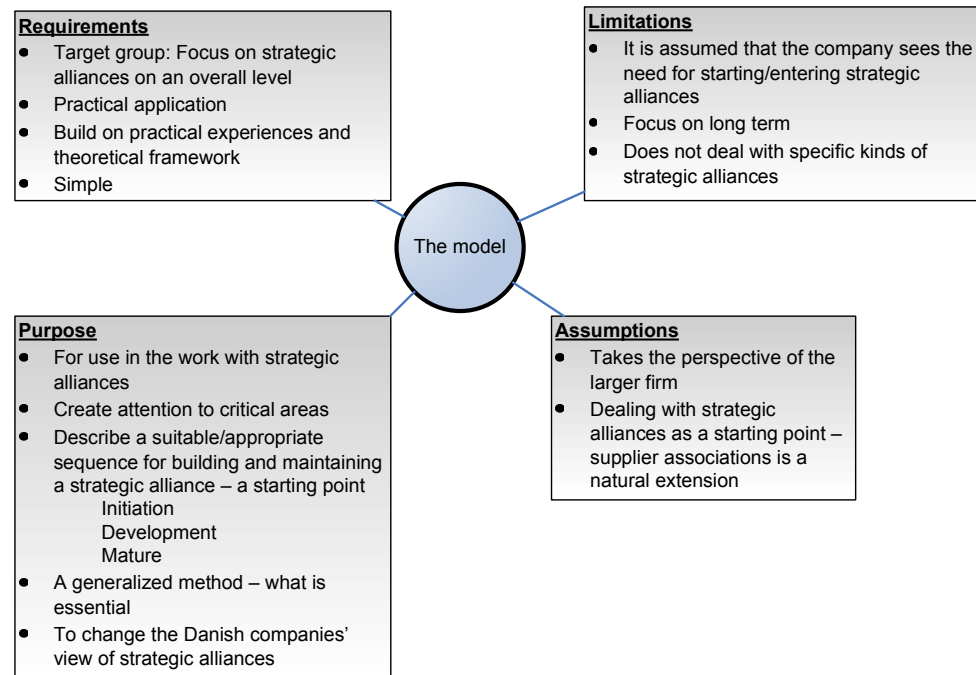


Figure 95 - Purpose, requirements and limitations of the model

Limitations

Attention is on the traditional buyer-supplier relationship in terms of manufacturing because this is the focus of the participating Danish companies and the investigated Japanese companies.

*“The usefulness depends on what situation you are looking at. E.g. many companies in Japan **are** Toyota so they are a perfect example of a strategic alliance, but then again how many types of strategic alliances are there?”*

Mr. Adams (TME interview, 2007)

This is a good point but there has not been enough time to investigate how different types of strategic alliances might influence the procedure.

The focus on manufacturing is evident in the procedure – e.g. go and see the fact which is associated with the factory floor. This is of course not necessarily the case in other industries, but the concept of seeing the fact is true for all industries making the procedure useful in general.

As argued in the section on SMEs (Part 4 – Theory), the procedure takes the perspective of a bigger company working with a supplier. Building a network is the task of the larger firm, which is aided by the presence of SMEs.

Entering a strategic alliance is based on a one to one proportion. It is the focal company and one supplier working together throughout the procedure, not like a supplier association formed by several suppliers and the company. But dealing with supplier associations is not excluded from the procedure. Strategic alliances and supplier associations are two aspects of the same subject, and the procedure is composed of elements from both. The benchmarking exercise in the development state can e.g. be conducted by suppliers in a group, and the improving of conditions in the mature state can be done in learning groups (*jishuken*). The focus on strategic alliances has been chosen since this is a prerequisite for building an association. Supplier associations should be seen as a further development of the alliance.

Purpose

The procedure is meant as a general method. The intention is to provide an overview of a (*possible*) process for entering a strategic alliance and to point out critical areas. It is meant as a help and not as a way to convince Danish companies of the importance of strategic alliances.

The procedure is not very detailed since we believe that doing so will reduce the usability in different industries. E.g. *kanban* and *heijunka* are not found in the procedure. Furthermore, the procedure covers a great area, and it is possible to conduct an entire project dealing with a single phase (explanation of a phase follows in next chapter) within one of the states. Literature has been studied on an overall level and not in particular on the individual phases. Rather, we wish to cover the whole procedure on an overall level because we believe that this will result in the biggest benefits.

Finally, we call it a procedure on purpose. It is not e.g. a model since there is not necessarily coherence between in- and output. There are not a number of prerequisites that must be satisfied in order to use it.

8.3 Structure

The procedure exists of three different states, which reflect the “natural” course of the development of an alliance – as we see it. It makes sense to talk about an initiation, a development and a mature state due to the fact that certain goals have to be reached during the procedure and furthermore, the theory supports it. Each state consists of three different levels as seen from the following figure:

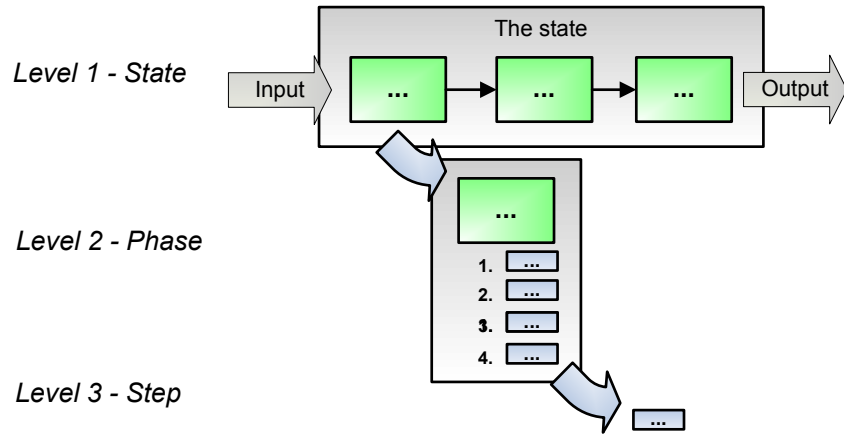


Figure 96 - Levels in each state of the procedure

In order to make the procedure structured and operational, a number of steps have been made for each phase in the state. Furthermore, the procedure is build up of inputs, the state it self and outputs as seen from the figure above.

With each state comes a table that gives a quick overview of the state. It has been divided into “background” containing a short description of the phase and who manages it; “execution” explaining the in- and output and what should be achieved and avoided for each phase; “assistance during execution” outlining how each phase is actually carried out. It is our wish that this together with the individually state can be used separately.

Input

To establish an alliance it is important that the supplier and the company have the same approach towards the future. The alliance depends on it and both parties must access the procedure seriously. Companies are different in culture and the way they handle business and this is some of the characteristics that the input part uncovers. It describes the characteristics individually and also the interaction between the companies. These characteristics changes as the companies progress towards the development and mature state.

The state itself

This part is build like a simple flowchart. Each phase must be completed before the next can begin. One phase could be e.g. choosing supplier and this phase is completed when an appropriate supplier is found. The way of approaching this problem will be described later, but the characteristics of this phase are the elements used to complete it. Different procedures and tools will be mentioned as a way to address the phase, and furthermore, the yellow light in the lower right corner indicates whether it could be helpful to involve consultants with a special knowledge – see the figure underneath:

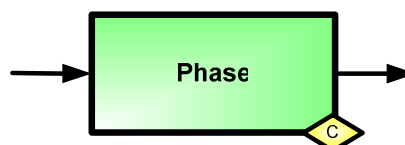


Figure 97 - The individual phase

Each phase have an input and an output. The input originates from the previous phase and output is the result used for next phase – e.g. to choose a suppliers to work together with. Furthermore, things to achieve and avoid are identified for each phase. It could be elements like pitfalls in connection with execution and necessary part results. These are pointed out in the table for each state.

The output part

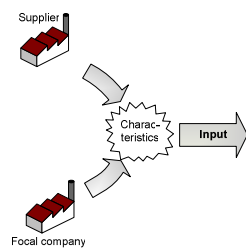
The output is the result of the last phase in the state. It should be characterized by some goals which should be fulfilled. Besides that, there is the box called “areas to address” where the important focus areas are listed. These should be seen as areas throughout the state, which has to be solved or addressed– some of them in the end of the state.

The development and mature state are run through a couple of times (perhaps more) before the next state is reached. It is a natural progress with new learning every time it they are repeated. Everything cannot be learned at once – it takes time. When the targets are fulfilled, next state can be started.

8.4 Initiation state

The overall goal of this state is to establish an agreement between the focal company and a future collaborator unknown at this moment. Concepts like alignment of expectations and trust make out this state, which is the beginning of a hopefully long lasting beneficial relationship.

8.4.1 Input characteristics



The inputs are the different characteristics that the two companies contribute with, mostly their “personality” – the company culture, way of doing business and state of development.

Characteristics of the suppliers

The characteristics are divided in two categories inspired from quality management (Hartz, 2006 and Hartz, 1990) and product management (Kotler and Keller, 2006).

Need to have	Nice to have
<ul style="list-style-type: none"> • Right product, capacity, knowledge, core competencies etc. • Passionate management • Knowledge of Lean to a certain extent 	<ul style="list-style-type: none"> • High level of openness • Lean experience • Cultural fit • Technological fit • Nearby location • High innovative skills, etc.

Figure 98 - Supplier characteristics (source: Part 4 – Theory and Part 5 & 7 – Fieldwork in Japan and Brussels)

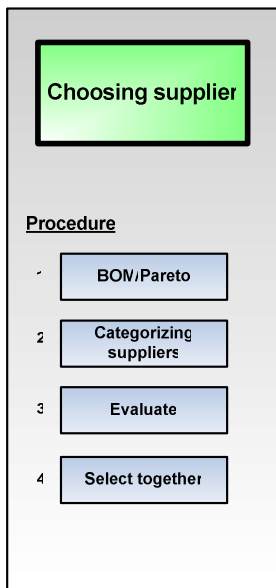
Need to have are characteristics that the supplier must have in order to be in business with the focal company and nice to have are the characteristics that make it possible to differentiate. The last mentioned are the ones (together with criteria mentioned

later) among which the focal company chooses the future partner for the alliance. Often it is only 1st-tier suppliers because it is too complicated to develop a strategic alliance with a 2nd or 3rd-tier compared to the gains.

Characteristics of the focal company

The focal company should prefer a long term view rather than a short term and have preferences for dealing with few firms instead of many. The management and the rest of the company must be passionate and prepared for opening up and expose themselves. It seems like simple words, but still a difficult decision for many to make, though, it is a new way of doing business. Furthermore, the focal company must be an important customer seen with the eyes of the supplier – Toyota operates with half of the output as a rule of thumb.

8.4.2 Choosing supplier



Choosing supplier is the first phase in the initiation state. The phase is a simple straight forward process. The key aspects are to pick out the one of strategic importance.

A proper starting point could be to make a bill of material and a Pareto analysis (NEC uses both, TME some kind of Pareto). Either one helps clarifying the content of the product/products regarding the suppliers. It is a systematic approach – many companies will claim that they know the influence of all their suppliers, still it is a rational starting point. BOM splits up the product on a part level continued by a Pareto analysis that splits up the most important suppliers from the BOM (BOM and Pareto is only carried out if it makes sense).

The categorizing is done by evaluating each supplier with regard to importance of the purchase and sourcing difficulty – input are the suppliers from the Pareto and BOM. They are plotted in the matrix underneath; the ones in the upper right corner are of greatest importance (strategic purchase).

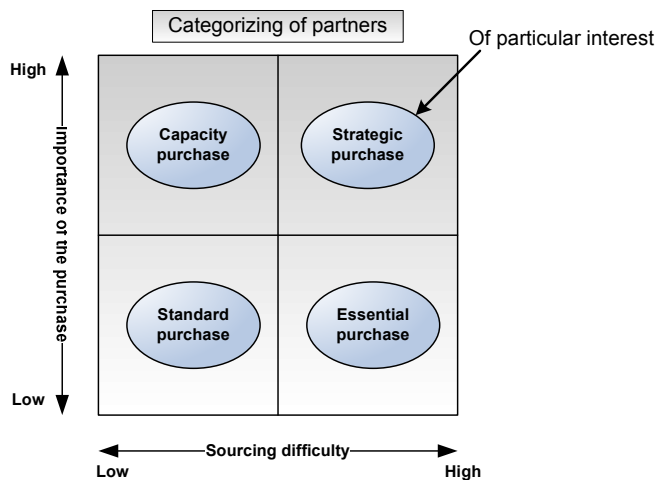


Figure 99 – categorizing of suppliers

The suppliers located in “strategic purchase” makes up the core, why they are target for further corporation. Some companies will find only a few actors in this area, no matter how many, it is important to keep in mind that the procedure is based on one-to-one why only one can be chosen.

The ongoing procedure for choosing the single supplier must be based on individual preferences depending on the focal company. Geographical location, future development, familiarity are characteristics that can be considered if it is not obvious to choose. A simple advice from Mr. Sawamura:

“Choose the easiest supplier. Go for the small one, with a culture and standards like your company, to whom your business is important.”

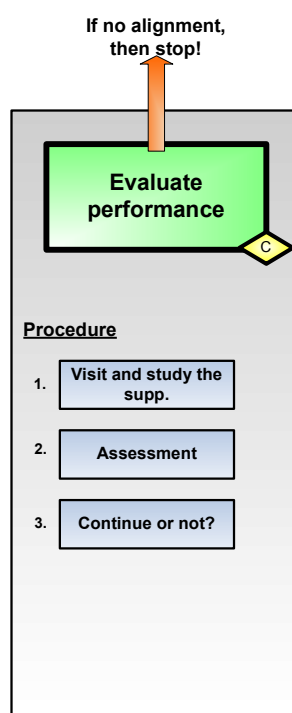
Mr. Sawamura (NEC interview, 2006)

To secure that the agreement is fully understood by all managers involved, it is important that a written agreement is made signed by all parties. This makes it clear that all agreed why no one can be claimed if the attempt turns out to fail.

<i>Reasons for signing an agreement</i>	
<ul style="list-style-type: none"> • Everybody agrees from the start • No one takes personnel responsibility • It creates a team spirit 	<ul style="list-style-type: none"> • More skilled minds to secure the right choice • Problems become clearer and nothing is hidden

Figure 100 - Advantages in signing an agreement (source: based on Part 4 – Theory and Part 5 & 7 – Fieldwork in Japan and Brussels)

8.4.3 Evaluate performance



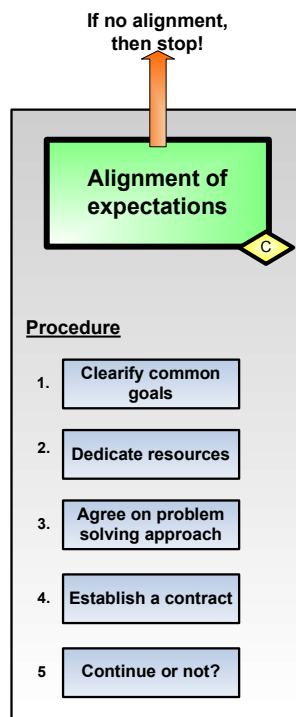
An appropriate supplier has been chosen and next phase is to evaluate the performance level of the supplier. The focal company is seen as the major player with regards to extension of Lean and supply chain management, and for that reason one must be prepared for differences in the performance level. Within Toyota this phase is taken care of by OMCD by visiting the supplier and study the production. It is not about interfering in the production, rather about observing how a normal working day is like. Do the employees feel happy and how is the overall performance?

Due to the lack of experience regarding this field within many companies, it could be advisable to hire external consultant as tutors during this phase. They have the power of knowing what to look for, where to find it and how to evaluate it. A very important skill also pointed out by Toyotas Mr. Koda during a company visit.

The field study is followed by an assessment done on the location. The starting point is relatively simple – the assessment is meant to be developed over time in the following state. Focus should be placed on key factors compared to the kind of alliance that is being developed. If it is based on manufacturing it is obviously that many of the assessment points are within this field.

The output of this phase is very simple – yes or no. Either the focal company continues with the supplier or else it stops. At this point it is about minimizing the risk and investment.

8.4.4 Alignment of expectations



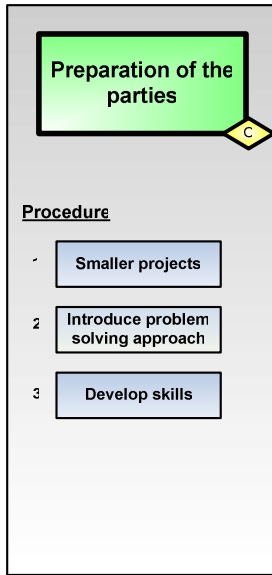
This phase is seen as the most important during this state. The single keyword is absolutely alignment – both parties of the future alliance must agree on every strategic element. This phase is focusing on the management level and the aim is to clarify the goals of the collaboration so everybody agree (development within the market, demand, deliveries, quality, sharing of benefit, contract and timeframe, etc.). Some common ground rules must be dictated all the way down from the strategic level to the operational level. In the long term view both companies must establish some common goals and combine these with a win-win way of thinking. Of course it is very difficult to satisfy both parties up front, why trust must be invested.

Each company must provide resources and personnel and to succeed some of the best employees must be used. Still it is on a management level and the team is not yet established. As described in Part 4 – Theory this is the moment for choosing an alliance manager. From the focal company's point of view the investment seems bigger due to the fact that it possesses most of the knowledge and skilled personnel, though, this should not be seen as a fifty-fifty relationship.

When the dedicated resources are submitted, it is important to define the main objectives in the daily work, especially the improvement work. A lot of it is evolved from the way problems are solved, why a problem solving approach must be determined. It is our belief that this approach has to follow the one used inside TME and TMC (see Part 7 – Fieldwork in Brussels). Though, this is not the time for determining exact procedure but more an overall approach.

All the agreements must be clarified in a contract to explain the common rules. In some ways this contract must be informal, especially when talking about price, performance and so on. Of course it should contain some overall goals for future deliveries, but it is also important to remember that the relationship is dynamic, why room for improvements is fundamentally. The establishing of the contract is a milestone and it indicates that the alliance is a reality

8.4.5 Preparation of the parties



Last phase of first state is focusing on the performance level from the evaluating phase (second phase in this state). Any mismatch is being taken care of typically throughout smaller 5S projects or kaizen events.

Main target is to raise the standards of both participators and optimize the facilities so they match each other. It is no necessarily taken places at the supplier’s facility; also the focal company is paid attention. Outcome should be a better knowledge of each others business, more team spirit and of course enhanced skills in each company.

The phase is taken care of primarily by specialists or external consultants and affected employees. It is the fist opportunity for the alliance to work together on a more operational level.

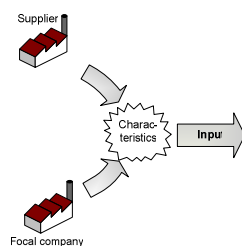
8.4.6 Changing to development state

Purpose of the initiation state is to establish a strategic alliance and focus is put on choosing the right supplier. The approach seems very rational but a lot of work has to be done in order to develop the alliance. This area is addressed throughout next phase, which is focusing on how to develop the relationship in order to fulfil the long term goals set up in the beginning.

8.5 Development state

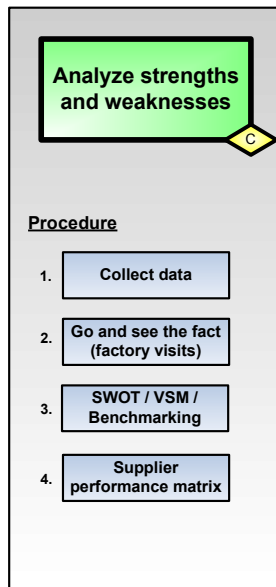
The strategic alliance has been established, and the work can start on a more practical level. The overall goal is to build more trust between the parties through different activities and at the same time create sustainable improvements in order to develop the alliance. It is important to get to know each other, and to encourage sharing of experiences and knowledge, and to create a wish to continue the alliance in the long term.

8.5.1 Input characteristics



In this state it is important to share information openly for planning purposes, and to get insight into areas of improvement. It is important to provide technical assistance and provide planning and feedback information. Toyota is very good in this area, and is capable of sharing it to all parts of the supply chain (TMC interview, 2006 and TME interview, 2007). An open book philosophy is used providing as much precise information as possible to help the suppliers. Problems can only be solved if they are evident. It is about knowing where one is heading and being respectful to each other

8.5.2 Analyze strengths and weaknesses



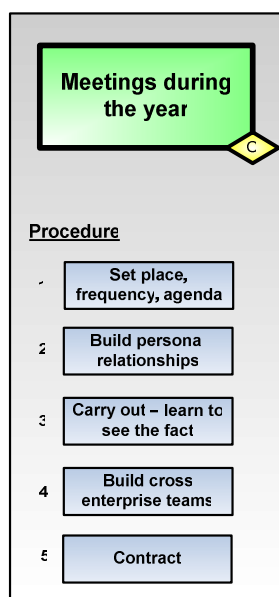
In order to get an overview of potential areas of improvement an analysis of strengths and weaknesses is carried out. Both internal and external conditions are examined, and different tools are used depending on the situation.

As always when doing an analysis it is necessary to collect data. In this connection it is important to emphasize that this involves going and seeing the fact e.g. through factory visits or by seeing a particular problem on the spot to create a personal impression of the conditions. It is also important to accept the fact that areas of improvement can lie at both parties.

After this, the analysis can be carried out through a SWOT or a benchmarking exercise (see e.g. Kotler & Keller, 2006 and Jacobsen, 2004 for a description on SWOT and Slack & Lewis, 2002 on benchmarking). It is important to identify best practices to learn from. Also, extended VSM is very essential to understand overall flow and the link between the partners.

As learned from TME the supplier performance matrix outlining the quality and delivery from suppliers can be useful. Through this it is identified how critical issues are and what kind of activities that are necessary to improve. We do not wish to use it in the exact same way, but there are many good points to learn from. – e.g. whether a dedicated person should work at the supplier for an extended period of time (as in SD) or more people supporting during smaller time periods many times (as in SI with approximately 1.5 days a week). With this information it is possible to plan future activities and monitor progress over time (see Part 7 – Fieldwork in Brussels for an explanation on SI and SD).

8.5.3 Meetings during the year



This is a phase of planning and meetings held on three different levels – senior-, process and action level – since it makes sense in relation to theory, and how it is normally done in a company (see e.g. Bjarnø, 2006 on the three different levels of planning). The purpose is to strengthen the identified weaknesses and learn from each other.

As seen from the figure to the left, frequency and agenda should be set to begin with (a suggestion on frequency can be seen from the accommodating table). The agenda is dependent on the level in question – from strategic decisions at senior level to detailed plans of action at the action level. For all levels it is important to follow up to evaluate if things are going as planned.

It is important to emphasize that beside the specific outcome of a meeting, the intent is to build the relationship itself and develop familiarity between members in order to increase trust. Mr. Adams (TME interview, 2007) pointed out that he as the Purchasing Senior General Manager meets with the top management (from strategic important suppliers) 2-3 times yearly to

secure the top-to-top commitment and the company attitudes. Also, the advantages from working together are explained.

Carry out – learn to see the fact

“TPS must be run from the top in Europe whereas it is more driven from the bottom in Japan” – Mr. Adams (TME interview, 2007)

“Normally in Europe the top management does not like to see the production. They like to see the computer” – Mr. Miura (TMC interview, 2006)

As evident from the quotations above it is important to make management understand the importance of seeing the fact in order for them to guide their own people. Practical experiences are essential for learning which was evident from the management courses held by TME.

<i>Management course</i>	
<ul style="list-style-type: none"> • Learn that time is best spent on the factory floor getting involved • Provides direction throughout the company – giving same basis and knowledge to everyone 	<p><u>Content</u></p> <ul style="list-style-type: none"> • See the fact – on the shop floor • Practical approach – doing kaizen on a concentrated level • Can be done individually or across suppliers

Figure 101 - Management course (source: TME interview, 2007)

It is important that this is done on things that have already been improved in order to be able to guide the process, and lead managers in the right direction. When going on the factory floor and actually doing it, managers will most likely realize that they did not understand properly – and this is a never ending process. Therefore these kinds of activities should be planned several times a year. One should never have meetings about something that is never seen or experienced. Furthermore, these courses on management level provide an opportunity to show the direction for the company by telling about the expectations for the future etc. (TME interview, 2007).

A second form of meeting that secures direction and creates motivation among suppliers is an annual supplier meeting (learned from TME).

<i>Annual supplier meeting</i>	
<p>In order to create motivation among suppliers and to learn from each other suppliers can be brought together on a yearly basis. Awards are given out to best performers which give something physically to bring back to the factory floor.</p> <p>Also, expectations for the upcoming year are given.</p>	<p>Structure</p> <p>Morning</p> <ul style="list-style-type: none"> • Different speakers making it short and clear what is important and how performance is on a general level • Upcoming expectations <p>Lunch</p> <ul style="list-style-type: none"> • Pep-talk from sales & marketing and people within the industry to give an impression of success <p>Afternoon</p> <ul style="list-style-type: none"> • Prize-giving

Figure 102 - Annual supplier meeting

In principal, this includes all suppliers – not only strategic suppliers – but still brought here because it provides a breeding ground for learning from each other and motivating for further development.

Build cross enterprise teams

A required condition for carrying out the action plans is the formation of cross enterprise teams since the actions involve both parties. It is a difficult area because many variables come into play (discussed in Part 4 – Theory).

<i>Personal skills</i>	<i>Composition of the group</i>
<ul style="list-style-type: none"> • Good communication skills • Trustworthy • Committed and motivated • Skilled and focused • Like new challenges 	<ul style="list-style-type: none"> • Size: Keep it limited • Skills in quality assurance, production control, R&D, production & maintenance and purchasing (depending on the particular alliance) • Degree of interaction depend on the intensiveness of the activities

Figure 103 - Building cross enterprise teams (source: Part 4 – Theory and Part 7 – Fieldwork in Brussels)

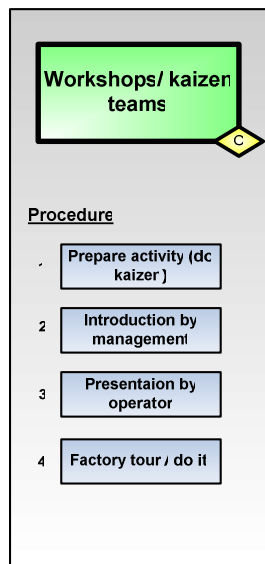
The creation of cross enterprise teams is of course very dependent on the kind of task in question. In the case of very intensive activities in which a lot of improvement is necessary, a team from the focal company will be working at the supplier using the necessary resources from the organisations. Otherwise, two similar groups from the partners will work together but implement independently (inspired by TME), and the aim is to create supplier momentum to take care of things themselves as times goes by.

With regards to coordinating the teams, we suggest this to be the focal company to begin with since they are the one building the network. They have the motivation, and know how to draw on expertise from the internal consulting department. The size of the team should be minimized – TME normally uses four people.

Contract

Last step is the contract. This is evaluated on a yearly basis (as a means to overcome the Danish short term focus as argued later). It is natural to do this in connection with the meetings on management level.

8.5.4 Workshops/Kaizen teams



Before being able to carry out the planned improvement activities at own site, a workshop or kaizen event might be preferable to learn from the more experienced company. Furthermore, it is a phase of introducing the concept for the employees on the shop floor.

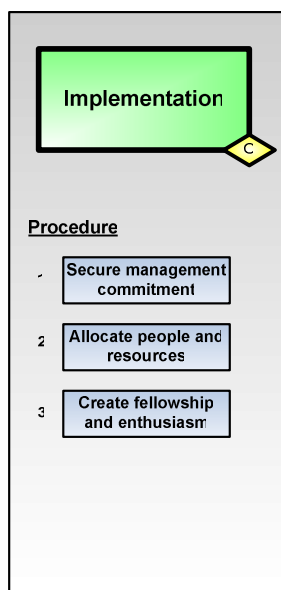
To make the activity successful preparation is essential. As in the case with management courses it is rather concentrated, and the work should be conducted on a problem known to the arranging company. It this way it is possible to guide the participants and let them experience for themselves under the guidance of e.g. consultants.

Again the approach is practical but it is useful to let the management introduce things which also creates an opportunity to explain the goals of the business and unify the mindset of both parties. This should be followed by an operator presenting work from own perspective, and showing what has been accomplished at the best performing partner.

A successful event creates enthusiasm for going to own site and work with the learned skills. Learning from like-minded can create a better understanding for the things necessary to be successful. With regards to the participants it is important that these are the once influenced and working with it on an every day basis. The place for the event can be at either company depending on experience and the problem worked on.

The frequency of workshops is difficult to determine. As a starting point it could be quarterly after the planning on senior level since there might be basis for sharing plans and show own experiences. But it also requires a lot of planning and resources why it should not be too often. The required time is typically from 2-5 days – Toyota uses two days (TME interview, 2006).

8.5.5 Implementation



This phase is the one requiring the most in this state, and also the most difficult one to detail. The purpose is to work at own site with the projects started at the workshops or starting a new project based on the experiences gained from the workshop.

In order to make it work commitment from top management is important, and it is essential that enough resources and the right people (besides the ones from the workshop) are allocated. As argued in theory it is important to create fellowship rather than leadership (from Gore's concept) and to create enthusiasm about the work in order to make it successful.

It takes time, and this fact should be accepted. Further assistance from the focal company is probably required, and should be used whenever needed.

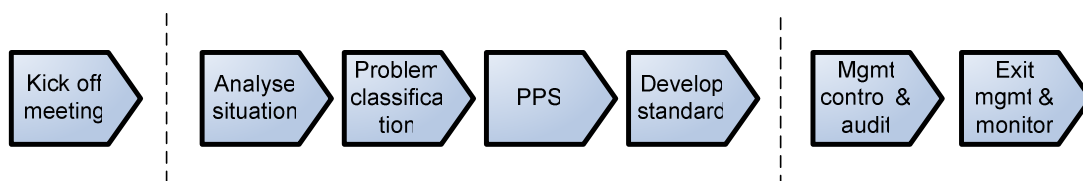
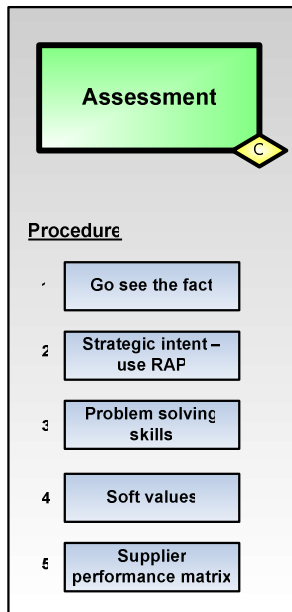


Figure 104 - Possible sequence for the implementation

Much can be learned from the SI activity at TME – a process of clarifying, doing and then assessing. It is essential that suppliers develop problem solving skills and experience in order to carry out the activities themselves. When management show the ability to maintain improvement and have sustainable methods to check and monitor the area in question then the implementation should be finished. The company should have developed its ability to see the fact and handle it.

8.5.6 Assessment



It is important to give feedback on a continuous basis in order to know about progress. To end the loop a more thorough assessment is carried out e.g. yearly to assess the implementations, and how performance is on an overall level

There are a number of Key Performance Indicators (KPIs) to measure on like delivery, quality, efficiency, price etc. Furthermore, it is essential that the strategic intent is clarified so that partners are still working towards the same goals and allocating the necessary resources. As pointed out in Part 4 – Theory the RAP tool is good in this situation.

As seen from the figure to the left it is also very important to address how the problem solving skills have developed, and how the relationships is working out in terms of the more soft values like job satisfaction. The assessment evolves over time as experienced from TME developing more and more criteria. It is important that the assessment is consistent in order to have a successful relationship, and the assessment should be the same for all suppliers.

Finally, the supplier performance matrix should be used to assess whether things are going in the right direction, and to clarify what kind of resources to allocate for further development. Of other tools to be used a GAP analysis can be mentioned (see e.g. Gjendal et al. (2005) for an example).

8.5.7 Output

The output of this state can be formulated in the things to achieve throughout the work as seen from the following figure:

- | <i>Achieve</i> |
|--|
| <ul style="list-style-type: none"> • Get to know each other – build trust • Commitment from suppliers • Maintaining key-personnel and tie them to the relationship for a long time • Education – go see the fact • Roughly plan for meetings during one year • Development of problem solving through learning by doing • Creation of cross enterprise teams • Monthly/quarterly reports |

Figure 105 - What should be achieved in the development state

The points have been discussed throughout the state, and are brought here to sum up. The main thing is to develop a supplier to improve on a continuous basis without big involvement from the focal company, and at the same time recognizing that the focal company also has a lot to learn. According to TME, suppliers are often concerned about actually doing what they are told and taught since this is difficult. This should be accomplished during this state through doing it on a practical level.

One thing to point out is the monthly or quarterly reports for keeping track of progress. It creates clearness, and it should be simple to use and make and have the same

layout over time. The particular layout and content of course depends on the situation – e.g. product or knowledge based alliance – but it should as a starting point be clear and manageable. How are the different departments doing compared to each other and earlier months. Problems and best practice are identified, creating a possibility to fix problems and learn from each other.

Finally suppliers should have realized the potential in being in a strategic alliance, and that it is a business necessity for them to improve and keep competitive.

8.5.8 Changing to the mature state

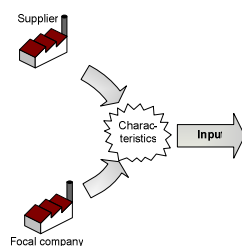
The mature state is characterized by a relationship that takes care of itself. The responsibility changes and running it all becomes a natural part of the business and requires fewer resources.

Familiarity with each other and increased trust is high, and the partners are developed together heading for the mature state.

8.6 Mature state

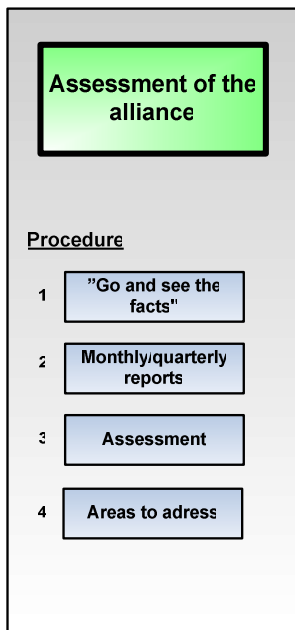
The transfer from development state into mature state indicates that the alliance has reached the final state. It is characterized by the way the relationship is running. Not much attention is needed from the management or the project team. We characterize this state by steadiness and continuous improvement in a smaller scale. Compared to the other states, smaller amounts of concrete methods can be drawn out. It is a question of how things have been done in the development state. Only few things are introduced – it is a matter of running the alliance on an every day basis.

8.6.1 Input characteristics



Main areas are still planning information and feedback information, but procedures for this have been established why it is not an area for great attention. The focal company has most likely started a new relationship with a new supplier, why attention is needed there.

8.6.2 Assessment of the alliance



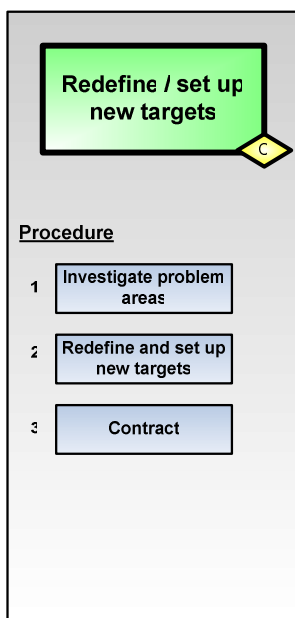
First step is “go and see the facts” – an aspect of the problem solving technique and it is very important to keep on doing it even though the assessment phase has ended. This must be seen as a never-ending process that helps evaluating the working place and the well-being of the employees. Outcome is a deeper insight and a better foundation for creating a competitive company.

By investigating the monthly/quarterly reports it is possible to get an overview of the performance and changes during the last year (a part of the internal and external feedback information). It is important too understand why changes occur – a fact closely related to “go and see the facts”.

Third step concludes the “collection” of data by making an assessment of the supplier. This assessment has been developed throughout the two previous states. In this state it should be fully developed and carried out as a normal part of the “daily work”. It should not be thought of as problematic – more like a routine assignment made every 4-6 month. It is our belief that one bigger assessment should be carried out each year in the light of the monthly/quarterly reports and a good way could be to do it together.

Output of the three previous steps is areas to address for further improvement compared to targets of the last period, still it is important to focus on the continuous improvement to prevent stagnation.

8.6.3 Redefine/set up new goals



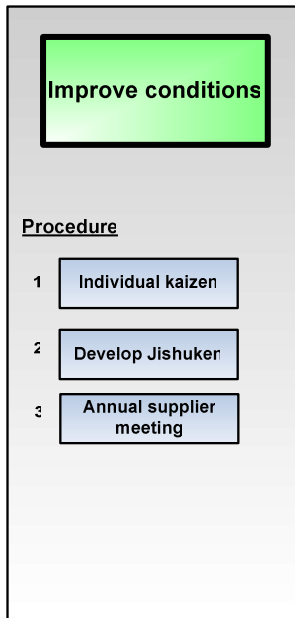
The areas from the previous phase are used to define next period for the alliance – two options can be used. Either, all the goals from the last period have been fulfilled, why new goals must be defined, or else problems have existed in some way that made it impossible to fulfil them. In this case it is necessary to analyze the problem, figure out why the goals have not been fulfilled and afterwards redefine some of the upcoming goals. It is a strategic process and it is important that the upcoming targets are realistic and obtainable.

The most important issue in this context is to challenge the system all the time. It is not necessarily positive to fulfil the target each year – instead they should be missed sometimes to make sure that they are of proper difficulty. In a way like the assembly line at Toyoda Gosei (TMC interview, 2006). If it does not stop for 20 minutes each day, the system is not challenged enough!

All these decisions are done in a dialog between the two companies and output should be contained in a written document outlining which goals that have been set up for the next period and which areas that should have attention in the further improvement process. The document could be a part of the yearly subscribed contract (if still evaluated yearly) and the right moment to make the contract could be in this phase.

The main output used in next phase is the areas for further investigation. These are the potential cost reduction areas and can be found both at the supplier and in the focal company.

8.6.4 Improve conditions



The interesting issues are to figure out how to obtain the goals, what procedures to use and how? Though, both companies have been working with this approach for many years – the knowledge and experience helps choosing the right procedure. One way used a lot by Toyota is the jishuken or learning teams explained in the fieldwork chapter. It is a simple approach, but it is our belief that it is very efficient.

If it is decided to keep the improvement process internal between the focal company and the supplier – for some reason – it could be appropriate to approach the problems in the terms of kaizen events. This is also the approach of Toyota and it seems reasonable.

This phase is completed when the objectives from last phase have been fulfilled. In that case the loop should be started by addressing the assessment phase once again. Though, in case of the yearly contract it is necessary to keep a steady flow, why the loop must be done on a yearly basis.

As in the development state an annual supplier meetings can be used to improve and motivate suppliers.

8.7 Areas to address

There are many areas to address when working in strategic alliances. Of special interest are the areas that change in importance over time as we see them. They are shown in the following figure which has been inspired by Part 4 – Theory and Part 5 and 7 – Fieldwork in Japan and Brussels.

	Initiation state	Development state	Mature state
Strategic fit	High	High	High
Contract	High	Medium	Low
Cross-enterprise teams	Low	High	Medium
Problem solving techniques	Low	High	High
Education & training	Low	High	Medium
Sharing of knowledge	Low	High	High
Sharing of success	Low	High	High
Consulting	Medium	High	Low

Figure 106 - Importance of areas to address

The initiation state is mostly concerned with management level whereas the development state is operational – things are to be realized. The alliance has become a natural part of doing business in the mature state requiring less attention. This evolution is reflected in the figure above.

As pointed out in the Part 4 – Theory it is essential that the strategic fit gets attention continuously since a mismatch is identified to be the main reason for failures. Another area to point out here is the contract. It is important to begin with in Denmark because of the short term focus and fear of being exposed as a supplier. But as the companies start to realize the benefits from working in strategic alliances and starts believing in it the importance falls.

8.8 Time and resources

It is very difficult to judge the amount of necessary time and resources throughout the procedure. In general it is important to allocate enough time and resources for it to be successful and be committed about it.

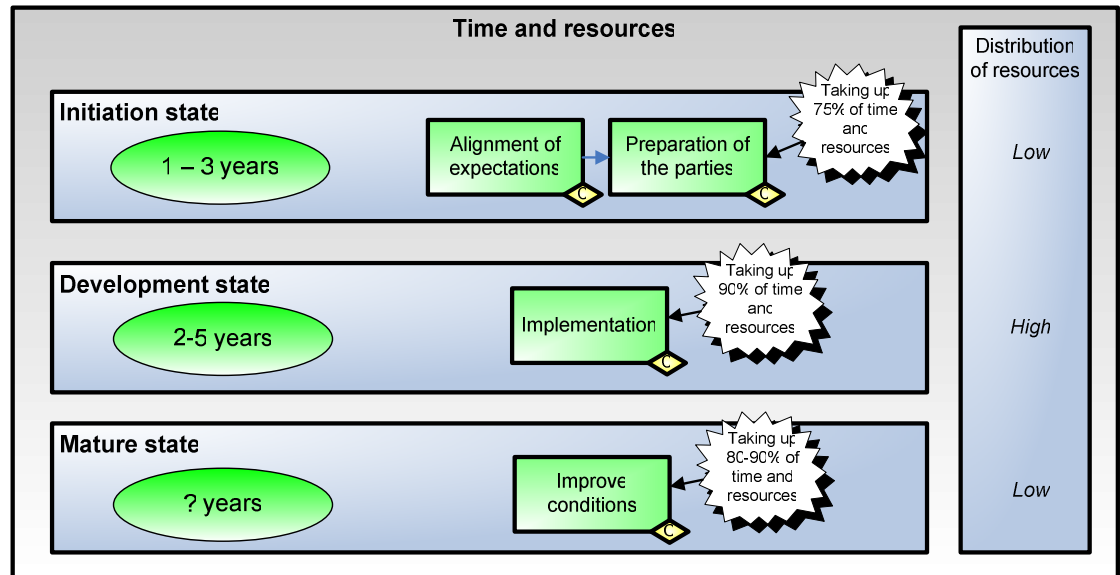


Figure 107 - Time and resources throughout the procedure

As seen from the figure above an estimate has been made of time required for each state. Furthermore, the phase(s) within each state that requires the most resources have been identified and the distribution of resources over the states have also been indicated. The most requiring state is the development state. Many of the bigger improvements have been carried out when reaching the mature state why the projects are only of minor scale requiring smaller resources. But saying specific how much is required is difficult and not done here.

Time

The estimates have been done on both the fieldwork and literature studies, and there seem to be a consistency between the two areas. The time span for the individual state might seem big, but it depends on the context and also experiences. This is proved by comparing NEC and TME. Their timeframes are very different because of different degrees of experience.

The development state is repeated a number of times – e.g. yearly – before reaching the mature state. In this way e.g. the trust is slowly built, and the alliance starts to take care of itself.

8.9 Profits and sharing benefits

As in the case with time and resources it is very difficult to say anything specific about the profits, and how they should be distributed. Hopefully a lot of cost reductions are achieved through the many improvement activities.

<i>Short term</i>	<i>Long term</i>
<ul style="list-style-type: none"> • Better understanding and coordination creating better responsiveness and flexibility 	<ul style="list-style-type: none"> • New knowledge/competences • New market opportunities • Bigger volume of orders • Bigger responsibility

Figure 108 - Profits in the short and long term

The advantages have been discussed in the theory part but in general greater knowledge about each other is gained creating competitive advantages. The case of Toyota keeps showing that the gains are bigger than the resources invested.

Two important points should be made here. First of all, sharing the benefits should not be negotiated extensively too early in the process when there is nothing concrete to argue about. This could result in a potential relationship ending for no real reason. Instead it should be done as the improvements start showing themselves, and it is possible to evaluate how much each partner put into it. Secondly, the gained benefits should be expressed in a lower cost price on the product. E.g. the supplier keeps the benefits from a particular improvement but in the long term the focal company should receive still lower prices on the bought products. In this way both parties gain and the focal company should not forget the importance and value of having good performing suppliers.

8.10 Manage Danish characteristics

A number of differences between Japan and Denmark have been identified (see Part 6 Comparing Japan and Denmark) some of them hindering the building of strategic alliances. These are seen from the table below:

Danish characteristics	Done to avoid downsides		
	Initiation state	Development state	Mature state
Short term focus	-Contract renegotiated every year; guidelines and expectations to the market and customers - One can always leave - Allocated resources to the relationship will create a barrier to leave	- Gained improvements show why it is worth working with - Available consultants to help make it long term - Seen possibilities with kaizen events	-This problem should no longer be an issue
Afraid of being dependent and exposed as a supplier	-Start with your self - be a good example and share e.g. Information - Must be solved in cooperation and not by the focal company demanding the changes - Present problems from the focal company's point of view to begin with	- Increased trust lessens the fear - See the benefit of being open	-This problem should no longer be an issue
Less use of facts	-Important to understand your suppliers - Go visit each other to see how things are working	- Kaizen events ensure insight - Factory tours ensure the practical point of view - Use of training for all levels to see the importance of seeing the fact	-Keep emphasizing the importance seeing the fact - e.g. through training
Difficulties with maintaining key personnel - a lot of job shopping	-Important to use documentation - Use of a key team instead of key individuals	- New challenges and education open up for personal development - Solidarity and familiarity because of a lot of teamwork - Deliver some of the gained benefits to the employees in the form of bonus	-Many of the same characteristics as in development state is still relevant
Mostly focusing on price in purchasing	-Important to use education so purchasing understand their role - Make guidelines clear e.g. between departments	- Cross enterprise teams should contain people from purchasing to make them understand the goals they are working towards - Education	-The benefit of not only focusing on price should have been experienced by this state

Figure 109 - Actions taken to avoid the downsides of the Danish characteristics

What is also seen from the table, are the initiatives taken in the three states to overcome the downsides of the characteristics. When entering a strategic alliance these characteristics must be dealt with to some extent because they create some obstacles towards a successful implementation. Overall the gained benefits play a great role since they directly show why strategic alliances should be build. The availability of free consultancy in return of a part of the success creates a stimulus for keeping working with difficult topics – there are always help to get. This is true throughout the procedure.

Initiation state

In order not to rush into the long term view we suggest that the contract is negotiated on a yearly basis. In this way there is a possibility to discuss the purpose of the alliance and to express dissatisfaction. Furthermore, there is always the opportunity to leave the alliance if one feel that it is not giving the expected benefits.

With regards to overcoming the fear of being dependent and exposed, it is important for the focal company to show a good example by e.g. starting to share information and present problems from the focal company's point of view.

In terms of maintaining key personnel it is important not to be too dependent on a single individual. This can be done through e.g. using a key *team* instead of key *individuals*.

Finally, it should be pointed out that it is important to understand that a strategic alliance will often bring changes to the role of the purchasing department. It is important to clarify this by e.g. using proper training if needed.

Development state

In this state the importance of going to see the fact is emphasized. Workshops and factory visits will help with this because an environment in which you go and see the fact is created. Also management should receive education and practical experience with going and seeing the fact. It is essential.

The new way of working in cross enterprise teams implementing improvements after being educated create new challenges and responsibilities for the employees. Personal development is possible and a new career path is created which deals with some of the reasons for the job-shopping in Denmark (we see the reasons for job-shopping as a way to follow a career, personal development, self-realization, earn more money etc.). Also, we believe in letting the employees benefit financially from the improvements made between the parties in some kind of bonus arrangement. As Mr. Ballard from TME expressed it – *people will not do what you expect but what you inspect* (TME interview, 2007).

In terms of job shopping this is recognized by TME but not seen as a problem. What is important is to create valuable jobs in which people can develop. TME is successful in this, and even though people from e.g. purchasing often get very attractive job offers they turn them down because they value their challenging jobs at Toyota.

With regards to the focus on price it is important to educate the people in purchasing, and involve them in the cross enterprise teams to make them understand the goals that are worked towards.

Mature state

Actually, being in this state implicates that the downsides of the Danish characteristics have been managed. It is important though, again to emphasize the importance of going and see the fact. This can be done e.g. through training if necessary as emphasized in the development state.

With regards to maintaining key personnel many of the characteristics from development state is still true.

8.11 Part conclusion

The procedure for entering a strategic alliance has been put out, and attention has been drawn to critical areas. The procedure gives a good suggestion of how to make it work on a practical level and points out possible tools on the way. In order to make it

as useful as possible, focus has been put on simplicity and the graphical element. We hope it will help the Danish companies when working with suppliers.

The procedure has not been detailed very much since we believe that this will reduce the wide area of application. Because it is made on a general level it can be used in many different situations. The procedure should of course not be seen as the only way to handle strategic alliances, but instead as an option.

Finally, the procedure helps to create attention to the fact, that much is required when working in close, long term relationships. This should be remembered at all times so the proper care and attention is given to the strategic alliance.

Part 9 CONCLUSIONS

This part outlines the final conclusions of the master thesis. Japanese companies and literature have been investigated and a procedure for entering a strategic alliance has been put out. The differences between Denmark and Japan have been taken into consideration. Conclusions towards the importance of culture have been made, saying that what matters is the business framework set up, and not the Japanese culture.

The intention in this part is to draw attention to a number of conditions needed for making our procedure work, and not to describe the procedure in a short version. Furthermore, a comparison between Danish and Japanese companies will be made concluding upon their level of Lean development. Before giving suggestions for further work, a number of myths towards Japan will be discussed.

CONTENT

- 9.1 RECOMMENDATIONS
 - 9.2 HOW ARE DANISH COMPANIES DOING?
 - 9.3 MYTHS ABOUT JAPAN
 - 9.4 FURTHER WORK
 - 9.5 FINAL CONCLUSION
-

9.1 Recommendations

We believe that a number of fundamental characteristics must be considered before starting a strategic alliance using our proposed procedure (see the following figure).

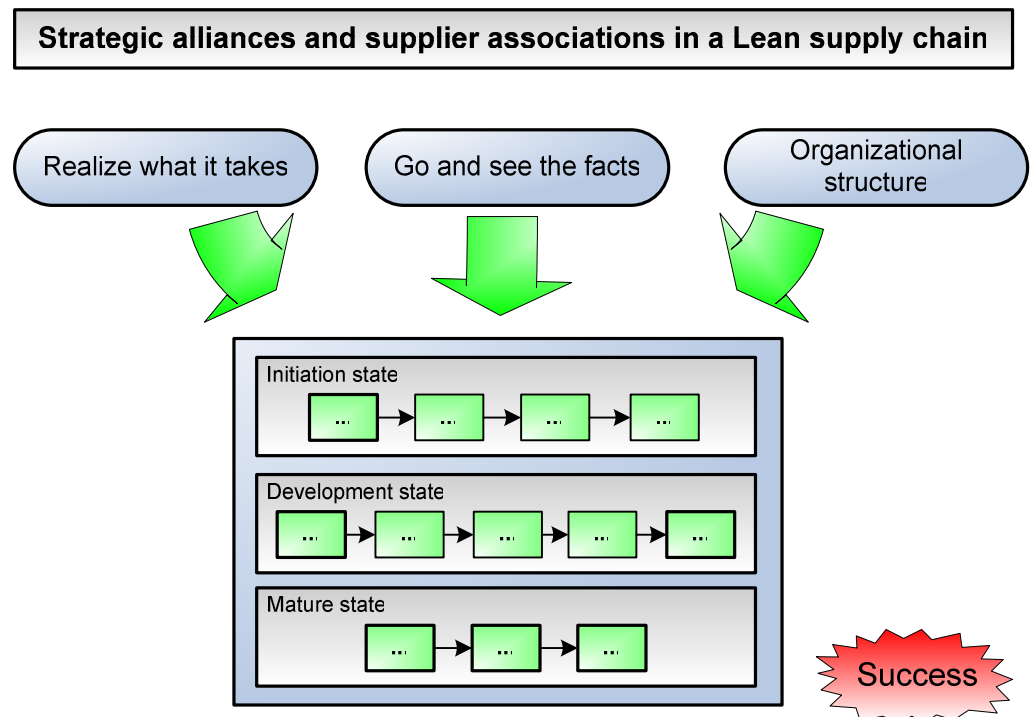


Figure 110 - Needed characteristics for being successful in working with the proposed procedure

9.1.1 Realize what it takes

Many Danish companies' perception of Lean indicates that it is perceived as a toolbox with a rational mindset behind, rather than as a philosophy. Cherry-picking is widely used in smaller projects, which has to do with the fact, that the Danish consultant industry uses Lean as solution, before the problem is known (own opinion). By selling Lean as a toolbox, it seems like it has been possible for many consultants to do smaller projects, e.g. optimization projects referred to as Lean, without selling the philosophy, which might explain some of the focus on the toolbox. When talking about Lean it is important to understand the meaning of the philosophy behind, and we would like to emphasize this.

Furthermore, it is important to be aware of the amount of resources, time and commitment that has to be invested to succeed. The fieldwork showed that it is a continuous process when developing Lean and a strategic alliance – e.g. NEC has developed their concept of TPS over the last six years, still there is much to do.

NEC's approach to implement TPS	
<ul style="list-style-type: none"> • Their concept has been developed over the last six years • Same consultant covered more than 20 sites and has been helping during the whole period 	<ul style="list-style-type: none"> • In the beginning: Two/three visits each month • Now the number of visits are reduced to one every third month

Figure 111 - NEC and TPS (source: NEC interview, 2006)

As the figure above explains, it is demanding to implement TPS and the work with an alliance must be thought of in the same way. Basically, the resources, the time and the commitment must be "unlimited" – many attempts to implement Lean has failed due to problems with maintaining the philosophy in the organization (Danish interviews, 2006). The same will happen during development of the alliance if the commitment from top management is not strong enough. Even the people from TME (TME interview, 2007) say, that it is hard to show in numbers that the long term view is preferable – but the success of Toyota proves it.

9.1.2 "Go and see the facts"

TMC calls it "Go and see the facts" and TME calls it "Study the process", but the meaning is the same. It is a part of their problem solving technique used internal and external at their suppliers. It is our belief that a similar concept must be implemented in the Danish managerial style. At Toyota, the value is produced on the assembly line, why it is natural for the management to put a lot of attention to this area. It makes sense, but it also creates problems because time is a limited resource. In Denmark the time of the management is widely used in meetings and different assignments behind a desk. E.g. TME chooses to cut down on internal meetings and instead use the time on the factory floor. How much time and how to create it, is an individual matter. Our point is to draw attention to the importance.

9.1.3 Organizational structure

As pointed out throughout the thesis, a Lean consulting function is very important. Furthermore, the role of the purchasing department changes. This is again emphasized here.

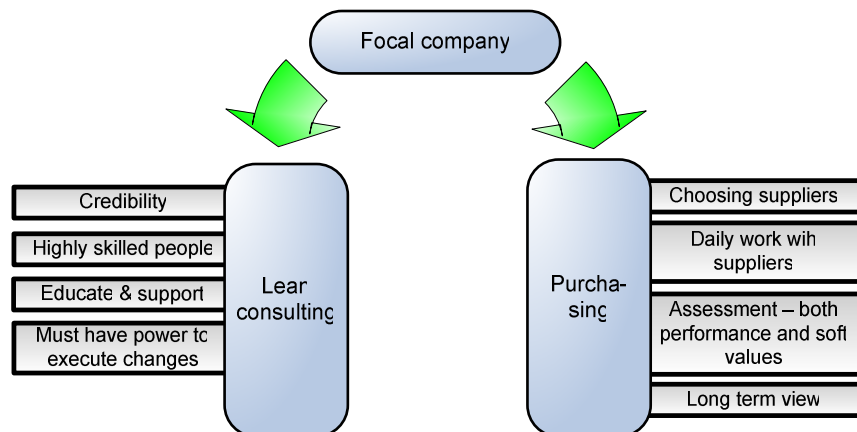


Figure 112 - The role of Lean consulting and purchasing

Establish an internal consultant function

The main reason for success lies within the people taking care of the changing process. They must have the right skills and the power to carry out an assignment in a credible way. Within TMC it is called OMCD and within TME it is called OMDD, and these functions are taking care of the TPS philosophy on a daily basis. The important aspect is that these consultants are real experts, and their abilities to create changes in the long run are impressive.

I cannot justify my pay check on a daily basis, but in the long run our department shows the necessarily results”

Mr. Ballard (TME interview, 2007)

A conclusion made in Japan was that seven out of eight Japanese companies adapted their production philosophy from TPS by learning from the best employees within Toyota. It was not a money or a time issue, and they did not go for the cheap consultants – a point that the Danish companies should have in mind. To maintain the knowledge in the organization, the company should establish an internal consulting department taking care of Lean. This department should be placed high in the organization to be able to make the right decisions quickly, without the interfering and resistance from the organization.

New role in the purchasing function

The purchasing department becomes the key interface in the work with suppliers on an every day basis – choosing suppliers, defining what is expected, developing their skills (in cooperation with the consulting function), coordinating activities and assessment, both on technical performance and in terms of the relationship itself. This is contrary to many Danish companies to whom price is the main focus. The view is long term and it is essential to build trust between the partners. Building these skills will make the work with strategic alliances and supplier associations easier as time goes by.

9.2 How are Danish companies doing?

After being in Japan and visiting a number of Japanese companies, a very interesting subject to address, is how far the Japanese companies are compared to Toyota, and furthermore, how the Danish companies are doing in this context. This is illustrated in the figure below, in which some of the conclusions can be seen also:

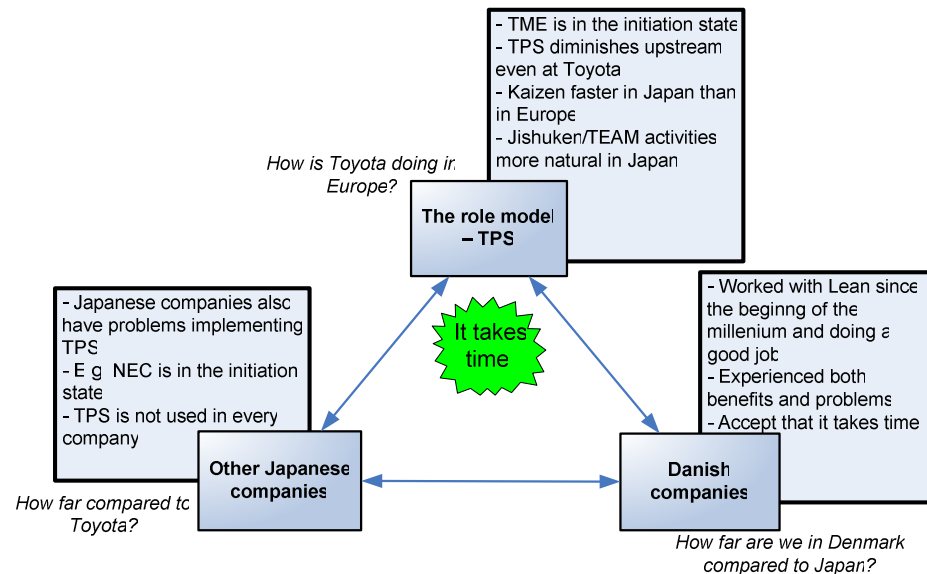


Figure 113 - Comparing Toyota, Japanese and Danish companies

The visit at TME gave us an opportunity to compare Toyota's activities in Japan and Europe.

Japanese companies

It is very interesting to observe that Japanese companies also have problems applying the principles of TPS. It requires persistence and patience, and it is not an easy task of which NEC is a good example. Furthermore, we experienced a 1st and 2nd tier supplier of Toyota in Japan, from which it was clear that the principles of TPS diminishes as you work your way upstream in the supply chain. One reason is the effect of heijunka which gradually deteriorate. In the case of Kawasaki and Denso, they manage the principles of TPS, but they have also worked with it for decades. Turning to Hitachi they are not working extensively with the principles of TPS showing that not all companies are turning to TPS. In this connection it is relevant to draw attention to an argument made by Mr. Adams, Purchasing Senior General Manager, TME:

"There are other ways to have success than using TPS. The German company BOSCH is a good example. They earn a lot of money and do not use TPS"

Mr. Adams (TME interview, 2007)

Toyota in Europe - TME

Turning to TME we have made some interesting conclusions. First of all, TME placed themselves way behind TMC in terms of TPS development, and they are currently working to replicate what is the case in Japan. Even though they have been working with TPS since 1992, it is still difficult to produce good results.

This is also seen when turning to the suppliers. European suppliers still have a lot to learn compared to the Japanese suppliers. E.g. the launch of a new product is done half a year faster in Japan than in Europe. Also, just because a certain part can be made with good quality in Japan, it does not imply good quality in Europe due to use of other suppliers and manufacturing processes – it is difficult!

When it comes to the Japanese transplants in Europe, conclusions can be made concerning the cultural differences. They find it difficult to operate in Europe because it is another way of doing business. This relates to the different culture, but also that e.g. the volume is different (smaller volumes). They have the best starting conditions if a green-field operation is chosen instead of moving into some facility already build, since it creates some limitations to the design etc. (TME interview, 2007).

It was also pointed out by TME that the rate of kaizen is faster in Japan compared to Europe. It is more a natural part of the work in Japan – but of course they also have many extra years of experience. TME is therefore putting effort into giving people experience with kaizen activities. Also, TEAM/jishuken (refer to Part 5 & 7 – Fieldwork in Japan and Brussels for an explanation on the subjects) is easier to carry out in Japan because of the culture. It is developed in the 1940s so they have more experience, and are more open-minded towards it.

9.2.1 TPS and Lean development comparison

By plotting the different Japanese companies together with TME and the Danish companies (see the figure underneath) it is possible to get an overview regarding years of work with TPS/Lean and years of TPS/Lean development (as we see it). TMC is used as the point of reference – they have worked approximately 60 years with TPS, so they have 60 years of experience.

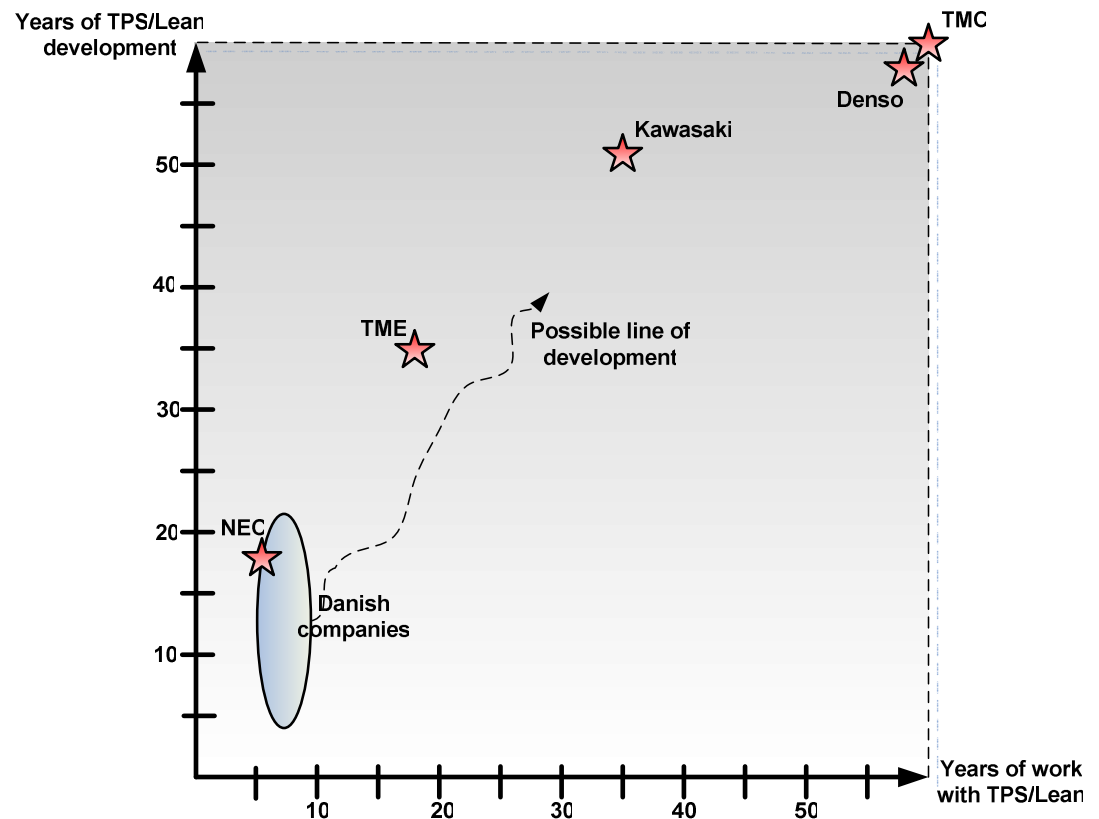


Figure - 114 Comparing Danish and Japanese companies with regards to TPS/Lean development

By investigating the figure it is obvious that especially TME, NEC and some of the Danish companies has developed faster compared to TMC. One example is TME who has been working with TPS since 1992. They have had approximately 35 years of development during the 15 years of work, why they are located above the diagonal. One reason for the fast development is of course the opportunity to use TMC experiences to avoid some of their pitfalls.

From the Danish companies' perspective, TME must be seen as their main benchmarking objective, since TME is a European division working in an environment comparable to the Danish industry. TME has the "best" resources at their disposal why it will be difficult to overtake their position. Though, in general the Danish companies are doing a good job.

Summing up

As mentioned, the service industry in Japan is very inefficient (see Part 6 – Comparing Japan and Denmark), indicating that applying Lean is not a natural part of everyday business in Japan. We strongly believe that Toyota is not world leading because of the Japanese culture but because they have worked and evolved the principles of TPS through many years. The Danish companies are trying to copy these principles in the form of Lean, but they have to understand that it takes time and endurance. It is a struggle even for the Japanese companies. Womack & Jones (2003) draw attention to the fact that Lean has not been universally applied in Japan – far from in all production operations and hardly at all in distribution and services. What we experienced in Japan supports this point of view.

TPS in Japan vs. Lean in Denmark

Danish companies have worked with Lean since the start of the millennium. Many have had great success and grasped the benefits while others have had big problems. But the picture is the same in Japan as we have experienced it, which is very interesting!

Figure 115 - Japan and Danish experience the same

9.3 Myths about Japan

When talking about Lean in Denmark, there are many perception and beliefs of Lean, how it is in Japan and why they are better. Some of them are listed in the figure underneath. The myths are as we see them, and this part will briefly give our point of view on the truth of these.

Myths and perceptions

- 1. The Japanese employees work as machines, harder and longer and do not mind standards**
- 2. It is another culture and that is why they succeed**

Figure 116 - Myths about Japan

The Japanese employees

The employee is perceived to work harder, longer, and does not mind standards. This is partly true, though, it depends on the type of business. Our perception is as follows, which is also supported by many of the Japanese people we met:

Our perception of the Japanese employees

If you take a Japanese employee who works for many hours, e.g. 10-12 each day, you will discover that the effectiveness of his work is very poor. It is true that Japanese people “live to work”, where Danish people “work to live”, but long working days are also considered as status in Japan, and in contrast not the results that one can perform!

The employees at the assembly line at Toyota work for 8 hours five days a week with a maximum of 45 minutes overtime. This is very familiar to the Danish conditions.

Figure 117 - Our perception of the Japanese employees (source: own experiences from Japan)

The culture

As mentioned, there are some differences in the culture, both related to the daily life and the working life, when Denmark and Japan are compared, see the figure underneath.

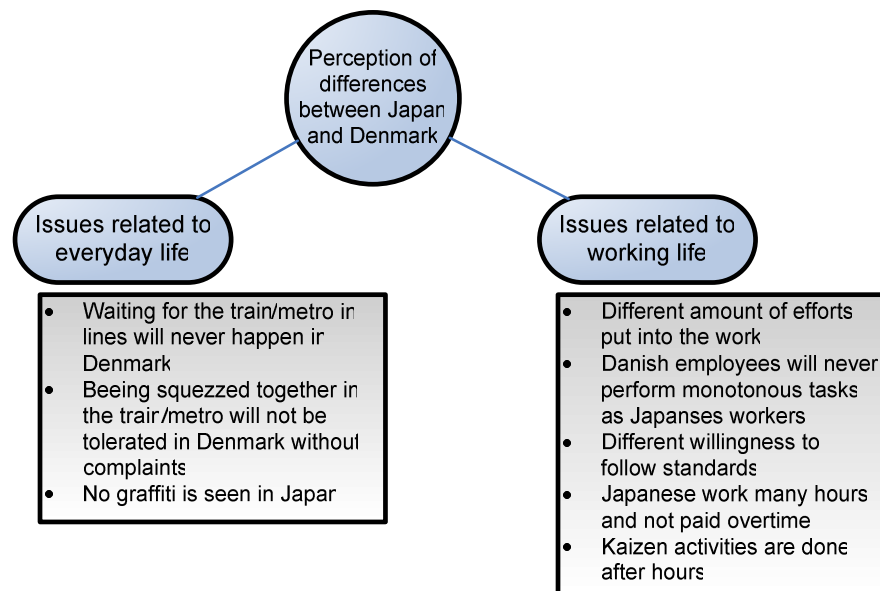


Figure 118 - Perception of differences between Japan and Denmark (source: own experiences from Denmark and Japan)

The Japanese have an advantage when it comes to standards since it is natural for them. But the Danish employees also have a very high level of education capable of thinking individually and creative, which is an advantage in terms of kaizen activities. The Japanese also have an advantage with smaller degrees of job-shopping (refer to Part 6 – Comparing Japan and Denmark for details on differences between Denmark and Japan). But after the TME visit there is no longer any doubt. TME struggles with the same problems as we do in Denmark, but they have moved on and accepted it. In terms of job-shopping, TME has tried to challenge their employees as much as possible to keep the skilled ones inside Toyota. When talking about standards TME do not see any problems. Cultural differences are just another challenge to overcome.

As we see it, our procedure takes the differences into account. What really matters is the framework set up for the business and the management belief and commitment. Culture is just an excuse. It should not be seen as a barrier.

9.4 Further work

There are a number of points that might be pointed out in this connection. First of all, the procedure is made with a general perspective in mind. Different kinds of strategic alliances have not been dealt with in terms of how it might influence the procedure. Furthermore, both the Danish and Japanese companies have been dealt with on a general level. The intention has been to create a procedure that can be used by many different companies, which too many details might hinder. On the other hand, criteria or certain specific circumstances that may have an influence on the success of the procedure, could have been overlooked.

When characterizing the Danish industry conclusions have partly been made on literature describing Western industry which Denmark is a part of, but of course there exists differences. One might point out that generalizations have been carried out too much, and therefore further work could include detailing the procedure and the Danish industry.

There has not been time for testing the procedure on an actual case, so we do not know if it will actually work in practice. We strongly believe in its application because it is built on information from very successful companies, but it is definitely worth checking in practice.

Blinded by TPS?

After working with TPS throughout this project, and visiting Toyota in both Japan and Europe, we are truly amazed by their way of doing business – every company can learn from it. But then the question naturally arises; are we blinded by TPS? Mr. Adams at TME pointed out that they do not actually know if TPS is the best way – but it works, which Toyota constantly shows throughout the world. Nevertheless, other opportunities certainly exist – it is a question of creating a more successful business. In the case of our procedure, it is a good starting point, and it happens to build on experiences from Toyota – but as long as it works.

Change management

As evident from our work, changes in the way of doing business will happen. As pointed out by all participating Danish companies (see Part 3 – Analysis of Lean in Denmark) change management is the biggest problem. We have not dealt with this aspect – how actually to implement the changes. This will be a big assignment.

Organizational structure

The impact of differences in managing companies in Japan and Denmark has not been considered to a great extent. Instead focus has been put on combining literature and fieldwork into our procedure. The impact of these differences could be examined further.

Despite the areas pointed out, we think that the conditions for the procedure are well documented, and we believe in it.

9.5 Final conclusion

This project has dealt with strategic alliances and supplier associations in a Lean supply chain. Literature has been studied and 16 companies from Denmark and Japan have been investigated including Toyota in both Japan and Europe.

Strategic alliances between the focal company and suppliers have been identified as a critical element, for a Lean enterprise to be successful and world-class. Toyota is a good example. They have created the necessary focus on close, long term partnerships and furthermore, enabled learning capabilities through a network of knowledge sharing – it is said to be the company's one truly sustainable competitive advantage.

Comparisons between the Danish and Japanese companies have been made. This concludes that the Danish companies are doing a good job, compared to how long they have worked with Lean. Furthermore, it is interesting to see that it is a struggle even for the Japanese companies, and that TPS diminishes upstream even at Toyota.

The main outcome of the master thesis is a procedure for entering a strategic alliance. It can also be used for supplier associations, but we conclude that the Danish companies are not ready for this yet. It has been our intent to build a general procedure in order to increase the application of it. The approach is operational and it outlines the steps needed to be successful in building a strategic alliance.

The procedure consists of three states – initiation, development and mature – which reflect a natural course of development. It takes the perspective of a bigger company working with a supplier, partly because building a network is the task of the larger firm. Though, it is also useful for the smaller companies, because they represent the other side of the alliance.

Attention has been drawn to critical areas and tools to use on the way. A keyword in this connection is learning. Our procedure helps the companies keep focus and makes the process manageable.

9.5.1 Cultural aspects

When transferring experiences from Japan to Denmark, it is important to be aware of differences and to clarify the importance of these. After being in Japan we strongly believe that it is not a question about culture but about managing the company in the right way. Our experiences from the Japanese service industry show that it is not necessarily normal to think improvements in Japan. It seems like Denmark is doing a much better job in this industry.

A number of Danish characteristics/problems have been identified compared to Japan; short term focus, high degree of job-shopping, afraid of being dependent as a supplier and less use of facts. On the other hand, Danish companies have an advantage in having independently, self-thinking and creative employees. We believe that it is important to see the cultural differences as challenges and not barriers, which has been done in our procedure.

Visiting TME in Brussels confirmed our conclusions towards the culture. They are fighting with some of the same obstacles as the Danish companies, but still they are very successful in applying the TPS principles from Japan. This tells us that the principles from TPS can be applied in Denmark, as long as they are adapted to the situation.

9.5.2 What does it take?

A number of recommendations have been put out. The management commitment is very essential and it must be realized how much it takes to succeed. It does not happen over night. TPS is said to work against human nature so passionate people and a lot of time and resources are necessary. Furthermore, we believe in the Japanese approach towards solving problems and improving. It is fundamental that the facts are seen, and that learning happens through practical experiences – this applies to *everyone*. It is also important that help is available whenever problems arise. For this reason a Lean consulting function should be established to assist suppliers. The purchasing department becomes the main interface between the focal company and the supplier which involves a new set of assignments.

The procedure is made on a general level and does not take specific company circumstances into account. We have included everything we believe are relevant. It is for the individual company to decide how they want to use the procedure in a specific context.

Furthermore, the procedure can be developed in a number of areas. The impact of different types of alliances has not been included which is also true for aspects like “change management”. In depth studies of each phase can also be carried out as further development, though, this is a very demanding assignment.

Toyota keeps showing around the world that things can be done. We are truly amazed by their way of doing business – every company can learn from it. Building the procedure on experiences from world-leading Japanese companies and literature studies, we believe in its application.

Part 10 REFERENCES & GLOSSARY

This part contains references and a glossary. Throughout the master thesis a number of terms have been used that might seem unfamiliar to the reader. These are listed here together with an explanation.

CONTENT

REFERENCES

GLOSSARY

References

Books

Bicheno, J. (2004)

The new lean toolbox – Towards fast, flexible flow, Moreton Press, Buckingham, England

Brooks, I. (2003)

Organizational behaviour – Individuals, groups and organisation, second edition, Prentice Hall, 2003

Chopra, S. and Meindl, P. (2004)

Supply chain management, Prentice Hall, 2004

Glenday, I. (2005)

Find vejen til flow – Undgå brandslukning og få en bedre kundeservice (Breaking through to flow – banish fire fighting and increase customer service), vers. 1.0, Lean Enterprise Academy, December 2005

Hartz, O. (1990)

Total kvalitetsstyring – et spørgsmål om tværoorganisatorisk samarbejde (Quality management – A question of interdepartmental cooperation), 1. udgave, 3. oplag, DIEU Danske Ingeniørers Efteruddannelse, Hørshold 1990

Hartz, O. (2006)

Kvalitetsstyring – begreber, aktiviteter, systemer og systemkrav (Quality management – concepts, activities, systems and system demands), Institut for Produktion og ledelse, Produktions- og Virksomhedsledelse, Danmarks Tekniske Universitet, Januar 2006

Jones, D and Womack, J. (2003)

Seeing the whole – Mapping the extended value stream version 1.1, The lean enterprise institute, Cambridge, Massachusetts, USA

Kotler, P. and Keller, K. L. (2006)

Marketing management, 12th edition, Pearson Prentice Hall, 2006

Liker, J. K. (2004)

The Toyota way – 14 Management principles from the world's greatest manufacturer, 1. edition. McGraw-Hill, 2004

Liker, J. K. and Meier, D. (2006)

The Toyota way fieldbook, McGraw-Hill Companies/USA, 2006

Lorange, P. and Roos, J. (1992)

Strategic alliances alliances – Formation, implementation, and evolution, Blackwell publishers, 1992

Lythcke-Jørgensen, J., Skjøtt-Larsen, T., and Svendsen, O. M. (2001)

SCM – Supply chain management i et ledelsesperspektiv (SCM – Supply chain management in a management perspective), Børsens Forlag A/S

Macinnes, R. L. (2002)

The Lean enterprise memory jogger – create value and eliminate waste throughout your company, 1st edition, GOAL/QPC United States of America

Martin, P. and Olds, M. (2004)

Geographica – Det store verdensatlas med landefakta (Geographica – The big world atlas with country facts), revised edition, Random House Australia, 2004

Milgate, M. (2001)

Alliances, outsourcing and the Lean organization, Quorum Books/United States of America

Ohno, T. (1988)

Toyota production system – Beyond large-scale production, Productivity Press, Portland, Oregon

Rother, M. and Shook, John (2003)

Lær at se (Learning to see), The Lean Enterprise Institute, Inc., 2003

Slack, N. and Lewis, M. (2002)

Operations strategy 1.ed, Prentice-Hall

Womack, J. P., Jones, D. T. and Roos, D. (1991)

The machine that changed the world: The story of lean production, 1st HarperPerennial ed.

Womack, J. P. and Jones, D. T. (2003)

Lean thinking – Banish waste and create wealth in your corporation, 2003 ed., Simon & Schuster UK Ltd

Articles

Achanga, P., Shehab, E., Roy, R. and Nelder, G. (2006)

Critical success factors for lean implementation within SMEs, Journal of Manufacturing Technology Management, Vol. 17 No. 4, pp. 460-471, 2006

Ahmadjian, C. L. and Lincoln, J. R. (2001)

Keiretsu, governance, and learning: Case studies in change from the Japanese automotive industry, Organization Science, Vol. 12, No. 6, Nov-Dec 2001, pp. 683-701

Akacum, A. and Dale, B.G. (1995)

Supplier partnering: Case study experiences, National Association of Purchasing Management, Inc.

Bhasin, S. and Burcher, P. (2006)

Lean viewed as a philosophy, Journal of Manufacturing Technology Management, Vol. 17 No. 1 2006, pp. 56-72

Bjarnø, O. C. (2006)

Strategibegrebet – en introduktion til operationsstrategien (Strategy – an introduction to operations strategy), Institut for Produktion og Ledelse, Danmarks Tekniske Universitet, 2006

Brouthers, K. D., Brouthers, L. E. and Wilkinson, T. J (1995)

Strategic alliances: Choose your partners, Long Range Planning, Vol. 28, No. 3, pp. 18-25, 1995

Doktor, R., Kawase, T. and Haig, J. H. (1986)

Culture as a constraint on productivity, International Studies of Management & Organization, Vol. XV, No. 3-4, pp. 8-16, 1986

DI (The Confederation of Danish Industries) (2005)

Produktivitet og Lean – DI's produktivitetsundersøgelse 2005 (Productivity and Lean – DI's investigation of productivity 2005), The Confederation of Danish Industries, 2005

DI (The Confederation of Danish Industries) (2006)

Global benchmark report – ready for globalisation, The Confederation of Danish Industries, April 2006

Dyer, J. H., Kale, P and Singh, H. (2001)

- How to make strategic alliances work, MIT Sloan Management Review, Summer 2001
- Dyer, J. H. and Hatch, N. W. (2004)**
Using supplier networks to learn faster, MIT Sloan Management Review, spring 2004
- Ellram, L. M. and Cooper, M. C. (1993)**
The relationship between supply chain management and keiretsu, The International Journal of Logistics Management, Vol. 4, No. 1, 1993
- Emiliani, M. L. (2000)**
Insight from industry – Supporting small businesses in their transition to lean production, Supply Chain Management: An International Journal, Vol. 5 No. 2, pp. 66-70, 2000
- Engqvist, H. (2004)**
Trends and developments in the Nordic sphere, AVR Allgemeiner Vliesstoff-Report, Issue 6, pp. 10-12, 2004
- Fawcett, S. (2005)**
Partnership in pursuit of Lean supply, Engineering Technology, February 2005
- Franks, S. (2003)**
Beyond Lean, Manufacturing Engineer, February 2003
- Hines, P. (1994)**
Supplier associations: The spread effect, Logistics Focus, Vol. 2 No. 5, 1995 pp. 2-5
- Hines, P. and Rich, N. (1998)**
Outsourcing competitive advantage: the use of supplier associations, International Journal of Physical Distribution & Logistics Management, Vol. 28 No. 7 1998, pp. 524-546
- Hofstede, G. (1983)**
National cultures in four dimensions – A research-based theory of cultural differences among nations, International Studies of Management & Organization, Vol. XIII, No.1-2, pp. 46-74, M.E. Sharpe, Inc., 1983
- Håkansson, H. and Ford, D.**
How should companies interact in business networks? Journal of Business Research 55, pp. 133-139, 2002
- James, T. (2005)**
Stepping back from Lean, IEE Manufacturing Engineer, February/March 2005
- Karlsson, C. and Åhlström, P. (1997)**
A lean and global smaller firm?, International Journal of Operations & Production Management, Vol. 17 No. 10, 1997, pp. 940-952
- Killen, C.P., Hunt, R., Ayres, B. and Janssen, C. (2002)**
Strategic alliances for world competitiveness, Int. J. Technology Management, Vol. 24, Nos. 5/6, pp. 569-582
- Koza, M. and Lewin, A. (2000)**
Managing partnerships and strategic alliances: raising the odds of success, European Management Journal, Vol. 18, No. 2, pp. 146-151, 2000
- Lamming, R. (1996)**
Squaring lean supply with supply chain management, International Journal of Operations & Production Management, Vol. 16 No. 2, 1996, pp. 183-196
- Lamming, R., Cousins, P.D. and Notman, D.M. (1996)**

- Beyond vendor assessment – Relationship assessment programmes, *European Journal of Purchasing & Supply Management*, Vol. 2, No. 4, pp. 173-181, 1996
- Laszkiewicz, M. (2003)**
Collaborative maintenance: A strategy to help manufacturers become lean, mean, and agile, *Plant Engineering Management Side*, September 2003
- Liker, Jeffrey K. and Choi, T. Y. (2004)**
Building deep supplier relationships, *Harvard Business Review*, December 2004
- Lorange, P., Roos, P. And Brønn, P. S. (1992)**
Building successful strategic alliances, *Long Range Planning*, Vol. 25, No. 6, pp. 10-17, 1992
- Maloni, M. and Benton, W.C. (2000)**
Power influences in the supply chain, *Journal of Business Logistics*, Vol. 21, No. 1, 2000
- Mehri, D. (2006)**
The darker side of Lean: An insider's perspective on the realities of the Toyota Production System, *Academy of Management Perspectives*, 2006
- Michelsen, Aage U. (2006)**
Lean – set i et historisk perspektiv(Lean – in a historical view), *Lean Børsens Ledelsehåndbog*, chapter 3.2, autumn 2006
- Møbjerg, L. (2007)**
Røde tal på tavlen, *Morgenavisen Jyllands-Posten*, section 2, January 14th, 2007
- Noori, H. and Lee, W. B. (2000)**
Fractal manufacturing partnership: exploring a new form of strategic alliance between OEMs and suppliers, *Logistics Information Management*, Vol. 13, No. 5, pp. 301-311, 2000
- OECD, 1997**
OECD Employment Outlook – Low-wage jobs: stepping stones to a better future or traps? OECD 1997
- OECD, 2006**
OECD Factbook 2006, Economic, environmental and social statistics, OECD 2006
- Palstrøm, B. (2006)**
Faldgruber i Lean, *The Federation of Danish Industries*, February 2006
- Phelps, T., Smith, M. and Hoenes, T. (2004)**
Building a lean supply chain, www.sme.org/manufacturingengineering, May 2004
- Reeve, J. M. (2002)**
The financial advantages of the Lean supply chain, *Supply Chain Management Review*, March/April 2002
- Rich, N. and Hines, P. (1997)**
Supply-chain management and time-based competition: the role of the supplier association, *International Journal of Physical Distribution & Logistics Management*, Vol. 27 No. 3/4 1997, pp. 210-225
- Schlegel, G. L. and Smith, R. C. (2005)**
The next stage of supply chain excellence, *Supply Chain Management Review*, March 2005
- Spear, S. and Bowen, H. K. (1999)**
Decoding the DNA of the Toyota Production System, *Harvard Business Review*, September-October 1999

Spear, S. J. (2004)

Learning to lead at Toyota, Harvard Business Review, May 2004

Spekman, R. E., Isabella, L. A., MacAvoy, T. C. And Forbes III, T. (1996)

Creating strategic alliances which endure, Long Range Planning, Vol. 29, No. 3, pp. 346-357, 1996

Stuart, F. I. and McCutcheon, D. (1996)

Sustaining strategic supplier alliances – Profiling the dynamic requirements for continued development, International Journal of Operations & Production Management, Vol. 16 No. 10, 1996, pp. 5-22

Stuart, I., Deckert, P., McCutcheon, D. and Kunst, R. (1998)

Case study – A leveraged learning network, Sloan Management Review, Summer 1998

Torinus, J. (2006)

Toyota's relationship with vendors is an important link in its success, Milwaukee Journal Sentinel, Aug. 6., 2006

Vitasek, K., Manrodt, K. B. and Abbott, J. (2005)

What makes a lean supply chain, Supply Chain Management Review, October 2005

Womack, J. P. and Jones, Daniel T. (1994)

From Lean Production to the Lean Enterprise, Harvard Business Review March-April 1994

Womack, J. P. and Jones, D. T. (1996)

Beyond Toyota: How to root out waste and pursue perfection, Harvard Business Review September-October, 1996

Wu, Y.C. (2003)

Lean manufacturing: a perspective of lean suppliers, International Journal of Operations & Production Management, Vol. 23 No. 11, 2003, pp. 1349-1376

Brochures and Company Materiel

Center For Ledelse (2006)

Medlemsmøde om Lean thinking (membership meeting about Lean thinking), Center For Ledelse, January 25th, 2006

Webpages

<http://www.lean.org>

<http://http://www.dansk-lean-akademi.dk/>

<http://http://www.teknologisk.dk/produktivit/11536>

<http://www.scvisions.com>

<http://www.geert-hofstede.com>

<http://www.post.dk>

<http://www.oecd.org>

Japanese companies

<http://www.toyota.co.jp/en/index.html>

<http://www.toyoda-gosei.com>

<http://www.otics.co.jp>

<http://www.nec.com>

<http://www.kawasaki.com>
<http://www.denso.co.jp/en/>
<http://www.hitachi.com>

Reports

Gjendal, N., Knudsen, J., Lindahl, M. M. and Stissing, S. (2005)

Øvelse i produktmodellering – produktspecifikationssystem til urfamilie D (exercise in product configuration – product specification system for clock product family D), Danmarks Tekniske Universitet, Spring 2005

Jørgensen, B.S. and Knage-Rasmussen, E. (2005)

Lean supply chain management – A Toyota case, master thesis, University of Tokyo, Japan and The Technical University of Denmark, Department of manufacturing and engineering (IPL), IPL-051-05

Thomsen, N. F. and Munkesø, J. M. (2005)

Analysis of Japanese manufacturing – From a Lean perspective, master thesis, The Technical University of Denmark, Department of manufacturing and engineering (IPL), IPL-052-05

Interviews

Jensen, H. V. (2006)

Consultant manager, The Federation of Danish Industries, telephone interview, Monday September 28th

Jensen, P. L. (2006)

Professor, Technical University of Denmark, telephone interview, Monday September 28th

Interviews in Denmark 2006 (see appendix for details)

Company A
Company B
Company C
Company D
Company E
Company F
Company G

Interviews in Japan 2006 (see appendix for details)

Toyota Motor Corporation (TMC)
Toyoda Gosei
Ichiei
NEC
Kawasaki
Denso
Hitachi

Interviews in Brussels 2007 (see appendix for details)

Toyota Motor Europe (TME)

Others

Jacobsen, P. (2004)

Slides from the course 42371 – Design and planning of production systems, Technical University of Denmark, 2004

Glossary

BOM: Bill of Material; A list of the materials and parts that go into a product

Gemba: The "real place" – in today's management it is referring to the factory floor where value adding processes are located.

Genchi Genbutsu: Go out and see for yourself. The place referred to is often the Gemba.

Heijunka: The creation of a "level schedule" by sequencing orders in a repetitive pattern and smoothing the day-to-day variations in total orders to correspond to longer-term demand.

Honne: What you actually feel or do.

Jidoka (autonomation): Transferring human intelligence to automated machinery so machines are able to detect the production of a single defective part and immediately stop themselves while asking for help.

Just-in-Time (JIT): A system for producing and delivering the right items at the right time in the right amounts. The key elements of Just-in-Time are: flow, pull, and standard work.

Kaikaku: Radical improvement of an activity to eliminate muda.

Kaizen: Continuous, incremental improvement of an activity to create more value and less muda.

Kanban: Normally a small card attached to boxes of parts that regulates the pull in TPS by signalling upstream production and delivering.

Keiretsu: groupings of Japanese firms with historic associations and cross-shareholdings, such that each firm maintains its operational independence but establishes permanent relations with other firms in its group. These groups emerged from the break-up of the zaibatsu or holding companies which dominated Japan's pre-war economy. Keiretsu may involve firms in widely different industries.

Kyoryoku kai (supplier association): A group made of important strategic suppliers. They meet to share experience and develop capabilities.

Monozukuri: Manufacturing policy. It is not mindless repetition; it requires creative minds and that is often related to craftsmanship, which can be learned through lengthy apprenticeships rather than the structured course curricula taught at traditional schools.

Muda: An activity that consumes resources but does not create any value – waste.

OMDD: Operations Management Development Division. A part of TME in Brussels.

OMCD: Operations Management Consultant Division. A part of TMC in Japan.

SD: Supplier development. Development of the chronic bad performing suppliers. Normally, it takes one consultant one year to develop the capabilities of the supplier.

SI: Supplier improvement. Improvement of strategic important suppliers. One consultant within Toyota works with 10-12 suppliers to develop their capabilities.

SPM: Supplier Production Management. They are also taking care preparation of model and furthermore, supplier improvements (SI).

SPTT: Supplier Preparation Tracking Team. They are taking care of preparation of new models. SPTT consist of members from five different departments.

Tatame: What you are supposed to feel or do.

TMC: Toyota Motor Company. Headquarter located in Nagoya, Japan.

TME: Toyota Motor Europe. European headquarters located in Brussels, Belgium.

TPS: Toyota Production System.

U-cell production: The layout of machines of different types performing operations in a U-shape.

Zaibatsu: Large capitalist enterprises of pre-World War II Japan, similar to cartels or trusts but usually organized around a single family.