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Towards Successful Production Concepts in Global Environment

The Final Report of "Production Anticipation in Multicultural Environments" Research Project

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Julkaisun nimike
Menestyksekkäät tuotantokonseptit globaalissa ympäristössä – ”Kappaletavaratuotannon ennakointi monikulttuurisissa olosuhteissa” -tutkimushankkeen loppuraportti

Tiivistelmä
Tutkimushankkeen tarkoitus oli kappaletavaratuotantoa harjoittavien yrityksien menestyksellinen tuotannon tukeminen. Hankkeen tavoitteena oli luoda tutkimustulosten pohjalta yleinen toimintamalli sekä tarvittavia työkaluja ja menetelmiä tarkoituksen saavuttamiseksi. Hankkeessa pyrittiin tunnistamaan ja vahvistamaan ennakolta menestyksellisen tuotannon ja logistiikan vaikutustekijöitä sekä tunnistamaan riskitekijät.

Tutkimusympäristönä olivat globaalisti toimivat sähkö- ja konepajateollisuuden yritykset ja niiden tuotanto- ja logistiikkatoiminnot sekä niihin liittyvät verkostot. Erilaiset toimintaympäristöt ja monikulttuuriset olosuhteet olivat merkittäviä taustatekijöitä tutkittaessa päätöksentekoa, suunnittelua ja toiminnan ohjausta tukevia konsepteja ja työkaluja.

Hankkeen peruslähtökohtana oli luoda toimintamalleja ja menetelmiä, joiden avulla jo tuotekehityksen aikana kyetään ennakolta varmistamaan tuotteiden valmistettavuus ja tuotannon aloittaminen uudessa ympäristössä.

Hankkeessa luotiin tuotannollistamiskonsepti uudessa ympäristössä aloitettavan tuotantotoimintaa varten. Konseptin keskeisiä tekijöitä ovat valmennuksen ja monikulttuurisuuden huomioiminen koko tuotannollisen toiminnan aikana. Hankkeessa luotiin systemaattinen suunnitteluprosessimalli uutta tuotantojärjestelmää varten.

Asiasanat
tuotantojärjestelmä, tuotantokonsepti, tuotantojärjestelmän suunnitelu, monikulttuurisuus, tuotannon vaikuttavuuden hallinta

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Towards successful production concepts in global environment – The Final Report of "Production Anticipation in Multicultural Environments" Research Project

Abstract

The main goal of the research project was to support companies that manufacture parcelled in their production activities. The aim of the project was to build general operations models and methods based on the results of the research. The main principle of the project was to recognize and strengthen in advance factors of successful production and logistics and also to recognize potential risks in advance.

The research environment was global companies in the field of the engineering and electronics. The main focus areas of the research were production and logistics networks. Differences in operational environments and cultural circumstances had effect on research of the models and methods needed in decision making, planning and control. The created models ensure in advance the manufacturability of the product and secure in advance the production start-up in new circumstances.

The result of the project was productionalization concept that supports the start-up of the production activities. The key factors of the concept were the recognition of the importance of the training and multiculturalism during the life cycle of the production. The project also produced a systematic design model for the new production system.

Keywords

production system, concepts of operations, design model for production system, multi-culturalism, manufacturing footprint

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1 INTRODUCTION

Global engineering and electronic companies face many challenges. The main challenges are constant development of competitiveness, ability to adapt to the local cultural and social circumstances and to maintain and improve organizational agility and flexibility. Management systems have to evolve in order to cope with these challenges. The organization and stakeholder networks must arrange their product development, manufacturing, logistics and marketing activities so that they can operate efficiently.

Engineering and electronic companies that develop, manufacture and market equipment and systems organize their operations as processes. Also the product development, manufacturing and marketing programs are developed concurrently. These factors give to a company a capability to foresee and plan actions in advance as well as in the long-term.

The main goal of the research project “Production anticipation in multicultural environments” was to support companies that manufacture parcelled goods so that they can successfully begin their production. The aim of the project was to build general operations models and methods based on the results of the research. The main principle of the project was to recognize and strengthen in advance the factors of the successful production and logistics and also to recognize potential risks. As the research moved on the challenges regarding the start-up of operations in circumstances became even important. Especially the successful management of the challenges of the multiculturalism emerged.

The paper is organized as follows: In the second chapter, the cultural concepts and definitions are discussed and the cultural issues study summarizes the effects of the multiculturalism in production. In the third chapter, the alignment of strategies and processes are discussed. The discussion covers the benefits of alignment of tactical level models and it reveals the new sources of synergy within and outside of the organization. In the fourth chapter the definition of the concepts of operations is given.

In the fifth chapter, the elements of production system are discussed also the design model for the new production system is proposed. In the sixth chapter the significance of product development in production anticipation is discussed. The seventh section represents the productionalization concept. The section also describes the elements of the proposed concept. Finally concluding remarks are discussed.

The main authors of each chapter are listed below:

1. Introduction (Simo Keskinen)
2. Aspects of culture (Simo Keskinen, Teemu Mäenpää, Kerstin Siakas)
3. Vertical and Horizontal alignment (Teemu Mäenpää, Vesa Nyrhilä)
4. Concepts of operations (Simo Keskinen, Teemu Mäenpää, Vesa Nyrhilä)
5. Elements of production system (Colleen Harris, Petri Helo, Simo Keskinen, Teemu Mäenpää, Vesa Nyrhilä)
6. Significance of product development (Simo Keskinen, Teemu Mäenpää, Vesa Nyrhilä)
7. Productionalization concept (Simo Keskinen, Teemu Mäenpää, Vesa Nyrhilä)
8. Concluding remarks (Simo Keskinen, Teemu Mäenpää, Vesa Nyrhilä)

2 ASPECTS OF CULTURE

In this chapter the role and charateristics of culture are discussed. The elements of cross-cultural comptence are presented. Finally the cultural issues study is discussed.

2.1 Cultural characterizations

Jim Collins and Jerry I. Porras (2004: 13) discovered in their research factors that all successful companies have in common. They have managed to recognize and preserve their core values and their aims. At the same time they have recognized the elements that must evolve constantly. These elements are culture, models of operation and strategy. The main point of the research by Porras and Collins can be summarized with the phrase "*preserve the core and secure the progress*".

Corporate culture can be reviewed from the following viewpoints - political power, rational thinking and target-oriented actions and human relationships as well as values and feelings. Corporate culture is an entity of shared basic assumptions that help the company deal with problems such as external adaptation and internal integration. These assumptions are introduced to new personnel as guidelines for perceiving, operating and thinking (Kettunen 1997: 183-185).

Each company has its own culture. Typical characteristics of the corporate culture are that people have the same worldviews and they have common values and interpretation of the surrounding world. People working in the same company have constructed their own, shared social reality (Kettunen 1997: 183-185).

The corporate culture manifests itself in the many forms how people relate to each other and their work, office staff gatherings, facilities, products and customers. Corporate culture has differences within the company; office workers, management and production personnel have different ways of speaking and working. Corporate culture has room for people's own ideas, habits, experiences and values. Common corporate culture is an aggregation of shared experiences, successes and failures (Kettunen 1997: 183-185).

2.2 Effective factors and utilization

The line of business as well as markets and competition shape the corporate culture (Deal & Kennedy 1987: 18). Corporate image, brand and recognizable products are other important factors (Kettunen 1997: 185). It is also worth noticing

that open bidirectional communication has positive influences on motivation, atmosphere and corporate culture (Jabe 2011: 42-44).

Despite the different characterizations, culture can be divided into two areas: content and utilization. Schein's model of organizational culture consists of three levels. The model is portrayed in Figure 1.

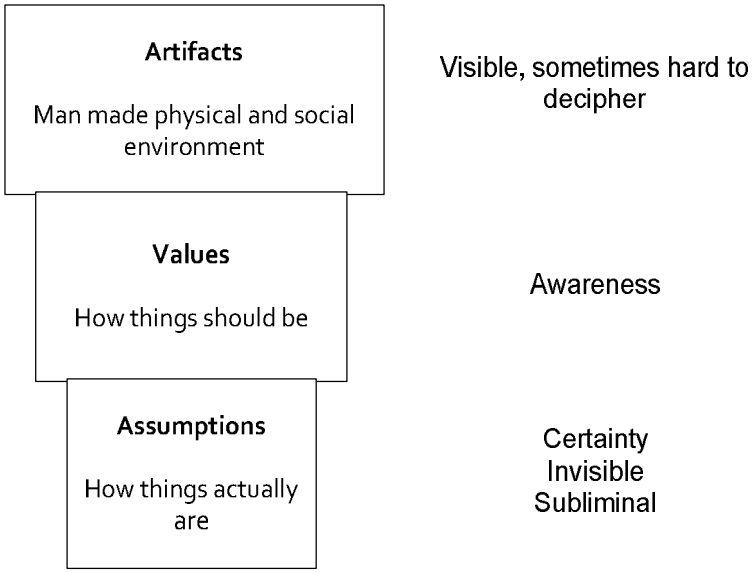

Figure 1. Levels of corporate culture (adapted from Schein 1987:32-35).

Usually management is responsible for the definition and realization of the corporate culture. Therefore it is natural that corporate culture is essential for both decision-making and leadership. Implementation of strategy also requires strong culture. Knowledge and competence management are the utilization areas of corporate culture. Culture plays a special role in revealing and sharing tacit knowledge. The utilization of corporate culture culminates in launching and internalization of values (Kettunen 1997: 188-200).

2.3 Corporate culture

The corporate culture is an extensive whole. To fully know, develop, and exploit it, the subject of corporate culture has to be considered from multiple aspects. The viewpoints for dissecting corporate culture are:

– definitions
– features and descriptions
– content

– ways of utilization
– significance

Edgar Schein defines corporate culture as follows:

> "A pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way you perceive, think, and feel in relation to those problems" (Schein 2004: 17).

André Laurent (1990: 89) gives the following definition for corporate culture:

> "An organization's culture reflects assumptions about clients, employees, mission, products, activities, and assumptions that have worked well in the past and which get translated into norms of behaviour, expectations about what are legitimate, desirable ways of thinking and acting."

Hampden-Turner has created (1991: 26-34) quite a unique view on corporate culture. The main function of the culture is to reconcile dilemmas. In other words, culture balances opposing values. A dilemma is a pair of apparently conflicting statements. The word dilemma is of a Greek origin, and literally it means "two different starting points". Corporate level daily dilemmas usually occur in the following fashion: should the product development be swifter so that company could defeat its rivals, or should the product development be slower and focus on quality. Larger strategic concerns have the same features: an organization has to preserve its continuums, but on the other hand it has to evolve. According to Hampden-Turner, the entire corporate culture is built on dilemmas. Some of the strenghts of Hampden-Turner's viewpoint are:

– It focuses on the essential points.
– It is an open-minded way of viewing different thematic entities as well differences in national cultures.
– It is an illustrative way of depicting how different companies with distinct cultures deal with the same starting points that are dilemmas. For some they become an atrophic vicious circle and for some they become a synergistic take-off.
– It is based on a system approach. Hampden-Turner states that corporate culture is a cybernetic system. All corporate cultures have common features; they receive feedback from their environment and adjust their behaviour accordingly.

The concept of dilemma can be described with the help dynamic balance, for example riding a bike (gravity versus cyclist's balance).

The concept of synergy has a clear linkage with the system approach. The word synergy is of a Greek origin (synergy), and it means to work with somebody. In Hampden-Turner's context it refers to the co-operation of different cultures and values. Hampden-Turner also says that western synergy is the closest concept to Japanese concept of "wa". Wa means harmony in business, which is the corner stone of both corporate and national culture in Japan. Values have to be compatible; if they are, they work well together. (Hampden-Turner 1991: 26-34)

To sum up, Trompenaars and Hampden-Turner (1998: 6) give culture the following definition "*a way in which a group of people solves problems and reconciles dilemmas.*"

2.4 Cross-cultural competence

Cross-cultural competence consists of three equally important components (Figure 2), knowledge of the specific culture, efficient skills in the language spoken in that culture, and knowledge and skills that support adaptation in any cross-cultural setting (Abbe 2008: 1).

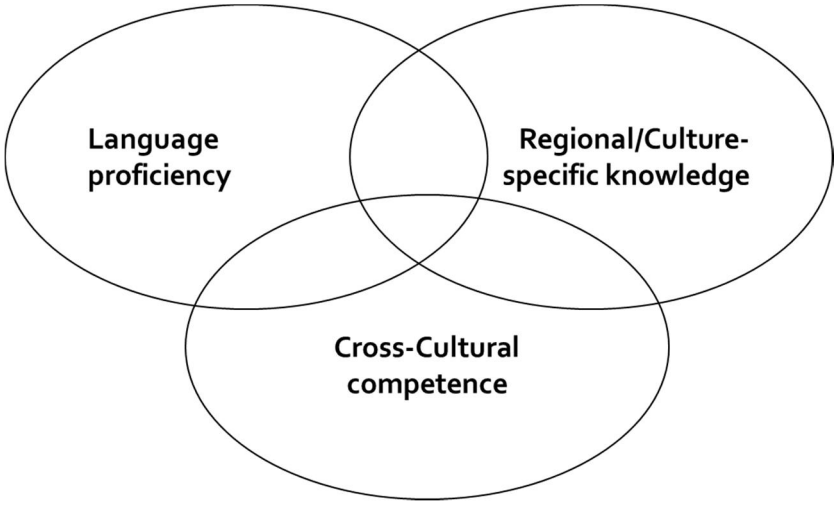

Figure 2. Elements of the cultural competence (from Abbe 2008: 2).

Abbe, Gulick and Herman (2008:1-3) present an extended general framework for cross-cultural competence. The framework widens the viewpoints depicted in Figure 3, it recognizes how the personal history and factors shape an individual's skills and competencies, and the framework also points out that competence has an effect on intercultural effectiveness.

Abbe et al. nominate the effective factors as "*Antecedent Variables*" which include dispositional elements such as aptitude and temperament, biographical factors such as experiences and education; the third element of antecedent variables refers to self and identity. The skill set is affected by factors called "*Intercultural Effectiveness"*. These factors are job performance and work adjustment, personal adjustment, interpersonal relationships and situational and organizational variables (Abbe et al. 2008: 1-3). The frame is portrayed in Figure 3.

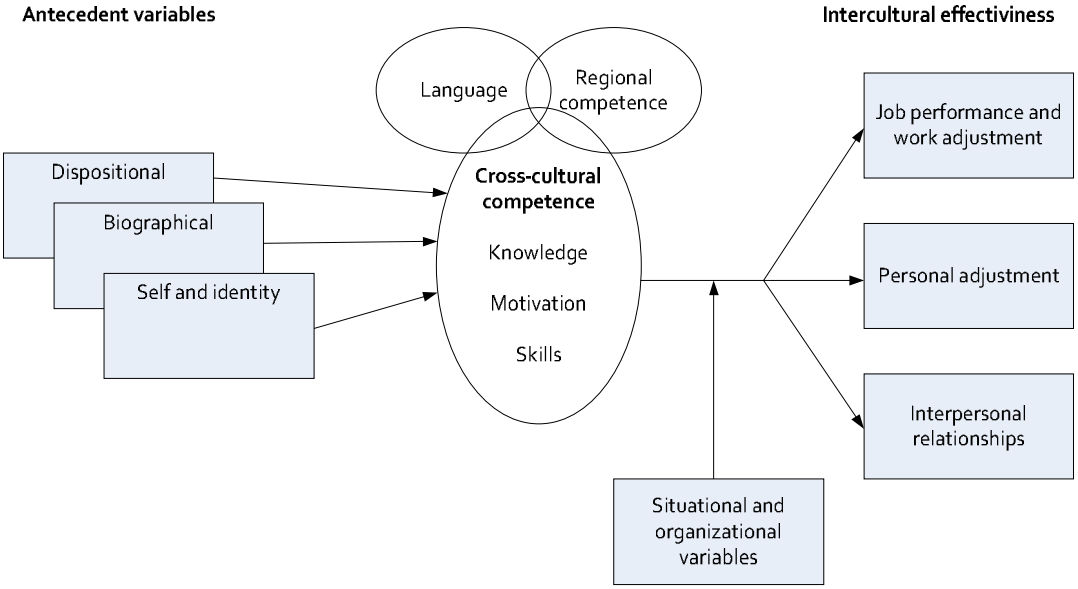

Figure 3. A general framework for cross-cultural competence (from Abbe, Gulick and Herman 2008: 2).

2.5 Cultural issues study

During the project a survey about the influence of cultural factors on global business, such as joint ventures, outsourcing or subsidiaries in a foreign country.

During the past few decades there has been a debate about convergence or divergence of work values. International organizations have tried to understand the diverse value system of their multinational structure. The objectives of multinational organizations are to create a universal culture in the whole organization and to integrate multi-domestic operations with individuals who hold opposed work-related values. There is evidence that national culture influences management practices, and multinational organizations need to adapt to the national cultures in which they operate in order to achieve high business performance. Research has shown that a fit between national and organizational culture plays an important role in organizations that promote a climate of satisfied employees.

Hofstede's study in the 1960s at IBM is the base for this viewpoint. Hofstede investigated how employees in different national contexts consider and react on the following four theoretical key elements, or "dimensions", of culture (Hofstede 1994; 2001), as described below:

- Power Distance (PD), which describes the extent to which hierarchies and unequal distribution of power is accepted;
- Uncertainty Avoidance (UA), which indicates the extent to which a society feels threatened by ambiguous situations and tries to avoid them by providing rules, believing in absolute truths, and refusing to tolerate deviance;
- Masculinity versus Femininity, which describes the relationship between the masculine assertiveness, competitiveness and materialism opposed to the feminine concern for quality of relationships, nurturing and social well-being;
- Individualism versus Collectivism, which describes the relationship between the individual independence and the collective interdependence of a group.

The outcome of Hofstede's survey shows that employees in the same national context share similar attitudes towards these four dimensions. Differences only arise between different national contexts.

Research has identified many organizational characteristics that seem to be influenced by the national culture, such as management systems, leadership style and organizational performance. Quality management practices in High Power Distance Countries seem to have centralized power structures and also seem to implement action programs extensively. Masculine Countries seem to focus on internal operations in their quality management practices. They spend more money on inspection and less on external quality. Information used for decision-making should be dependent on expected effectiveness in gaining advantage over competition. Feminine Countries are customer focused with proactive attitude to cooperation and a high consideration of environmental concerns. They seem to spend more money on external quality and less on inspection. High Uncertainty Avoidance Countries are committed to action programs, spend more money on inspection and have an emotional need for rules. In Individualist Countries people are autonomous and confident; they rely on their own ideas. Collectivistic Countries rely on information provided by others in formulating opinion. High Power Distance, Collective, High Uncertainty Avoidance countries perform better than competitors in relation to manufacturing conformance, product quality and reliability. Their Priorities (management strategies, improvement goals, action programs performance improvement) are affected to a small degree by Masculinity and Uncertainty Avoidance.

It is obvious that national cultures cannot easily be changed, while organizational cultures are manageable to some degree, and when several organizational cultures are involved in global business, the staff involved in international operations needs to be trained for effective cross-cultural communication and avoidance of cultural underestimations and misinterpretations of intent.

The research question in "Cultural Issues Study" is to what extent the organizational culture (the way the organization is structured and managed) and the national culture (the ethnic values of the workforce) influences the successful start-up and production in a global context.

The research methodology applied in this study is a qualitative approach using semi-structured interviews for the identification of a number of cultural factors that have a bearing on successful production in a global context.

In total, 9 interviewees took part in the study. All respondents had managerial positions and had been/are involved in international business operations. The countries that the interviewees have most experience of and also referred to in the interviews are presented in Table 1 together with the Hofstede's work-related cultural values.

Table 1. Countries discussed.

Country	Power distance	Individualism-Collectivism	Femininity-Masculinity	Uncertainty avoidance
World averages	55	43	50	64
Finland	33	63	59	26
China	80	20	–	20
South Korea	60	18	85	39
Thailand	64	20	64	34
India	77	48	40	56
East Africa*	64	52	41	27
Russia	–	–	–	–
Italy	50	76	75	70

The findings show that the working values are strongly influenced by the national culture. Organizations that take the local cultural values into consideration and show cultural sensitivity can gain added value and competitive advantage.

The interviews revealed that when Finnish organizations expand to challenging new foreign markets, they prefer joint ventures to minimize risks and gain advantage of local established networks. However, every interviewee recognized that taking cultural differences into consideration is crucial for success. The interviews confirmed the findings of Hofstede. It also became evident that it takes 4-5 months to start understanding a foreign culture. Some cross-cultural training is provided in advantage, but certainly more training would be required. The study and its findings are discussed in detail in Appendix 1: Cultural issues study.

3 VERTICAL AND HORIZONTAL ALIGNMENT

Labovitz and Rosansky (1997) introduced the concept of alignment in their book "*The power of alignment – How great companies stay centered and accomplish extraordinary things*". They state that both the vertical alignment of strategy and people and the horizontal alignment of processes and customers (Figure 4) help companies to focus their actions on the main thing. Labovitz and Rosansky divide the main thing into three components which are: 1) shared concepts which every unit can contribute to, 2) every department has to see a clear connection between what it does and the goal it is trying achieve and 3) the main thing has to be understood by every part of the company, and more importantly it needs to be uniform with the company's strategy (Labovitz & Rosansky 1997: 43-44).

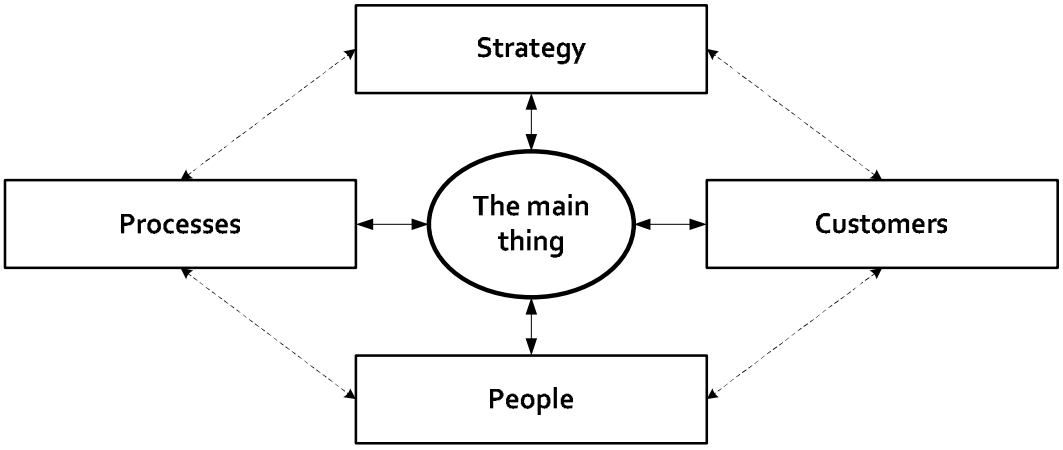

Figure 4. Focus on the main thing (from Labovitz and Rosansky 1997: 44).

The process of alignment consists of the following steps (Labovitz & Rosansky 1997: 7):

- define the main thing that is the core of the company's businesses,
- define and deploy critical strategic goals,
- link performance measures to the goals,
- create links between measures and the system of rewards, and
- personal evaluation of the people to ensure that they reach their goals.

Labovitz and Rosansky (1997: 5) point out that full alignment produces positive effects, it connects employees' behaviour with the company's mission, it links processes with customer needs, it shapes the business strategy based on real-time customer needs and it creates culture which enables co-operation between the elements presented in Figure 4.

Alignment of tactical level models

Labovitz and Rosansky discussed the importance and benefits of the horizontal and vertical alignment. In this chapter we apply the alignment approach to the tactical level models. Companies use tactical models for realizing their strategy. These models include the business model, product and service model, operations model and marketing model. The foundation of model alignment lies in the common background (Figure 5) and features of the models. These features are managerial environment: networks and cultures; previous development: history, present situation and future; operational environment: life cycle management; customer and application environments: niches and segments.

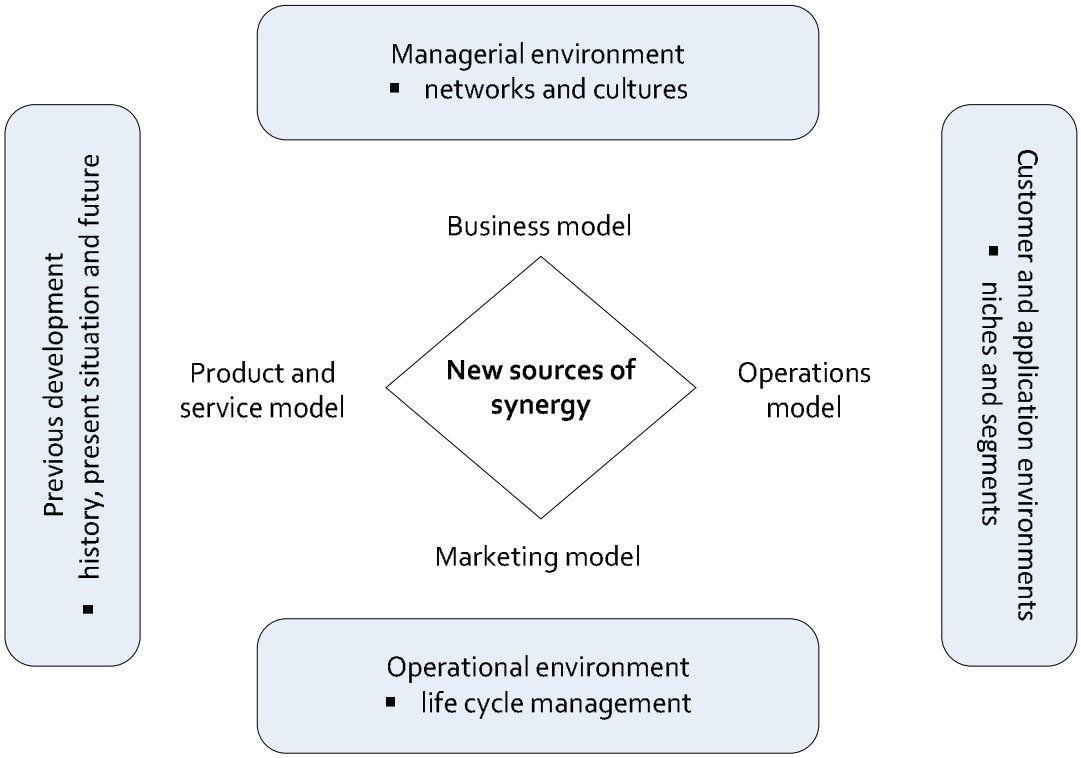

Figure 5. Common background and features of tactical level models.

The aligned and balanced models reveal the new sources of synergy within and outside of the organization. Inter-organizational sources of synergy arise from linking product and processes by roadmaps, proactive and concurrent actions; recognizing dependencies with different processes and areas; organizational learning and common services, systems and tools.

External synergy generates from a shared goal, background and context; common ways of realizing strategy into concrete actions; continuity of operations and advance recognition of possibilities for reuse and renewal.

4 CONCEPTS OF OPERATIONS

In this chapter the effective factors and elements of business management are discussed. Based on the factors a draft of the concepts of operations is proposed.

4.1 Three levels of business management

Strategy is a fairly unestablished and diverse concept in the field of business management. Karlöf (1996: 13) sums up strategy as follows "*Making decisions to ensure future success.*" Decision-making has to be goal-oriented, systematic and based on facts. (Karlöf 1996: 14). There are several definitions for strategy, for example Kettunen (1997: 164–165) gives the following definitions:

> "Strategy is an operational aggregate of technologies, products and market selection to realize the mission of the company" and "Strategy is the guiding line in the flux of actions".

Traditionally the three levels of control in business management are strategic, tactic and operative. The three-level approach enables the use of system thinking in development. The strategic level is based on a top-down approach and the operative level is based on a bottom-up approach (Figure 6).

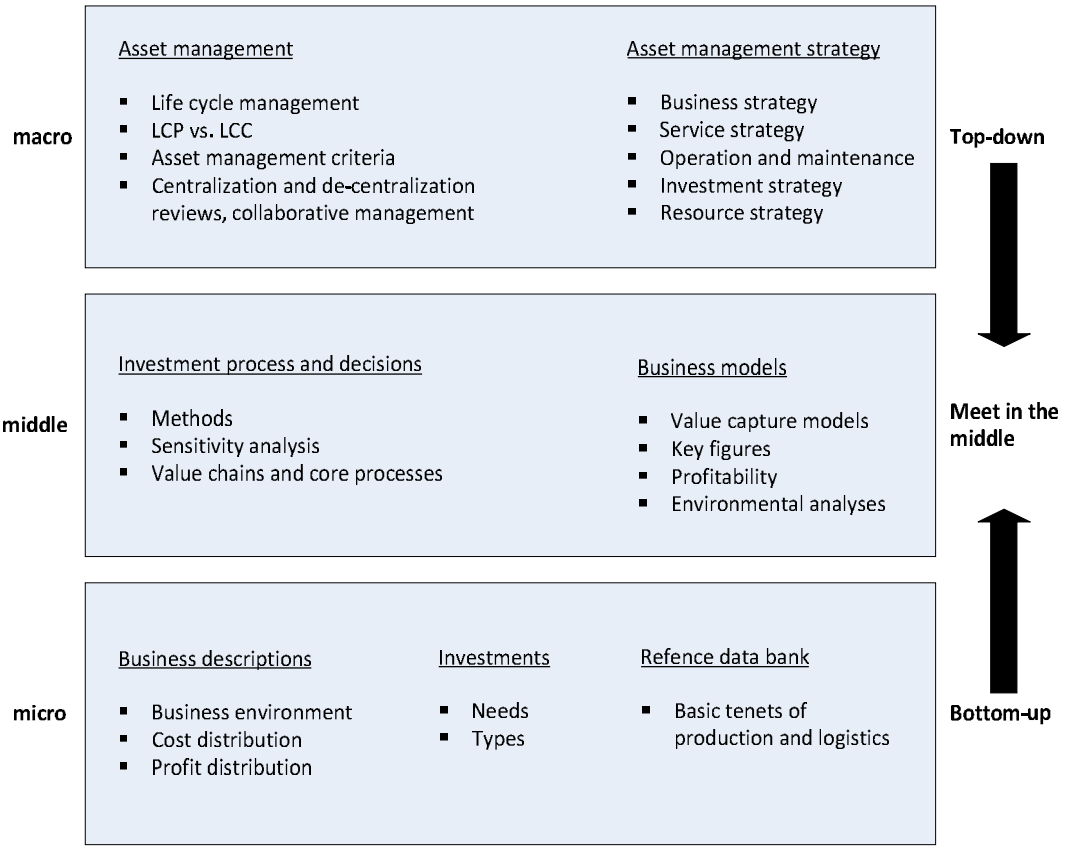

Figure 6. Three levels of business management.

The role of the middle-level is to consolidate and balance the strategic level and the operative level. In recent years, tools for middle-level management have been developed. These tools include business models, technology management models and concept management theories and practices.

4.2 Concepts of operations

Concept of operations is a fairly new concept. There is no clear definition for concepts of operations. The Finnish Funding Agency for Technology and Innovation (2011) has defined it as follows "*The concept of operations supports the company's business, it is expedient and consists of the company's own, sub-contracted or partnership based sourcing, manufacture and supply*".

The concepts of operations (Figure 8) are the most important tools for realising the strategies of the company. It connects and balances the strategic level with processes and their operational environment. Key strategies of the company are business strategy, marketing strategy, production and logistics strategy and hu-

man resources strategy. The strategy states out the means for achieving the goals that a company has set. Therefore we could say that

"Concepts of operations are a collection of decisions which are refined into models of operation based on certain strategies. Processes, operations and operation chains are controlled and developed by the model."

The concepts of operation are an aggregation of four elements:

1. The concepts of control, which describe the rules and principles of controlling production.
2. Knowledge management concepts define systems for decision-making and controlling operations.
3. Human resources concepts set out the principles for personnel training and development.
4. Technology concepts determine production and logistics technologies.

Broader consideration of the concepts of operations is based on the following questions.

1. What are the concepts of operations? – for example, definitions, descriptions and analogies
2. What is the composition of the concepts? – key factors and elements
3. Why are the concepts of operations needed? – purpose and functions
4. How are the concepts of operations utilised and applied?
5. What is the content of the concepts of operations? – focal points and linchpins
6. What is the overall influence of the concepts of operations? – immediate benefits, corollary and multiplicative effects and synergy potential

The Federation of Finnish Technology Industries published in 2003 a report "Tulevaisuuden voittajat - Liiketoiminnan ja teknologian linjaus 2010". The report describes the key elements of business strategy (Figure 7).

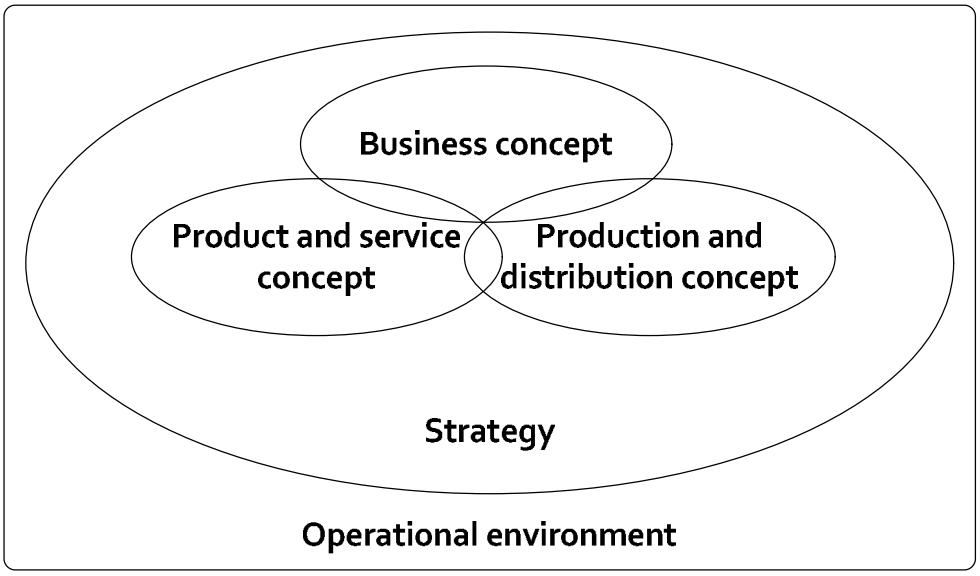

Figure 7. Key elements of business strategy (The Federation of Finnish Technology Industries 2003: 12).

In Figure 7 the production and logistics concept can be seen as a replenished description of the concepts of operations. The production and logistics concept is part of a company's management system. The essential function of the concepts depicted in Figure 7 is to realize strategic level policy definitions and to control the operational level actions. Figure 7 implies that the concepts have to be balanced and aligned. Concurrently developed models having a similar structure can reveal and even produce synergy advantages.

In the research project, a draft of the concepts of operations was made. The draft describes the key elements of the concepts of operations (5^{th} question). The concept is portrayed in Figure 8.

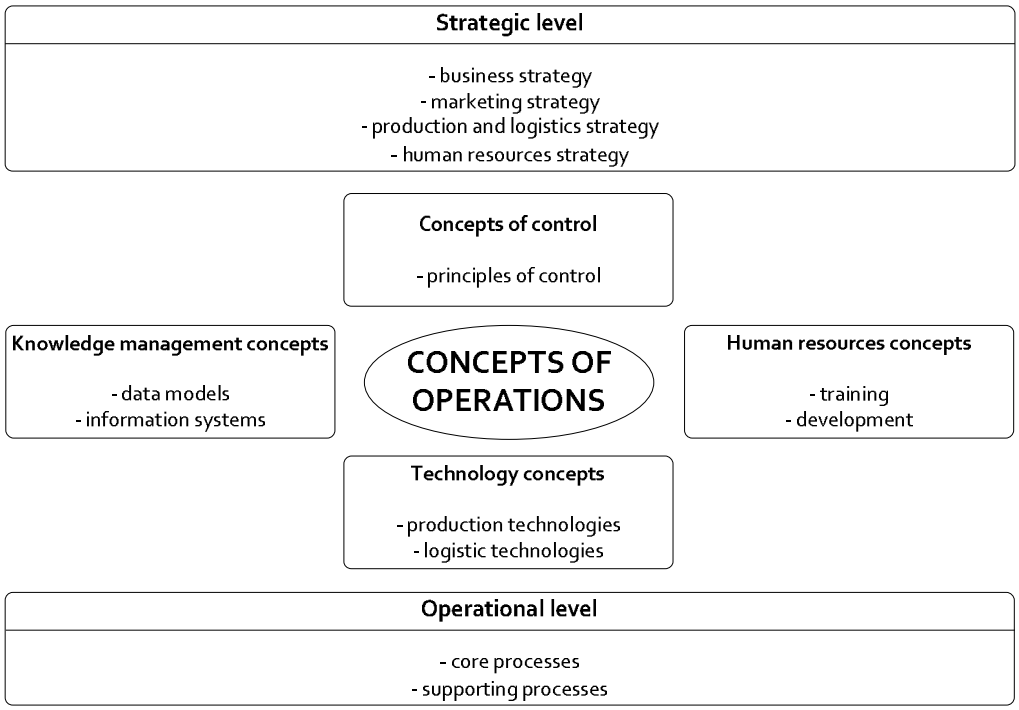

Figure 8. The concepts of operations.

The concepts presented in Figure 8 act as a guideline when the production system is constructed in a case-specific context. The concept is suitable in situations where there is continuity in operations and in situations where product portfolios are renewed.

5 ELEMENTS OF PRODUCTION SYSTEM

The production system is a system that converts product specifications, market expectations, and raw materials into products. The conversion is guided by the combination of workflows, manufacturing and control processes, and human intelligence (Jacobsen, Pedersen, Jensen & Witfelt 2002: 405). Schönsleben (2009: 384) states that a production system is a combination of the physical production infrastructure and the planning and control systems for the production.

Factors influencing the choice of the proper production type (Figure 9), according to Schönsleben (2009: 384-385), are volume and variety. Volume refers to production order batch size, which depends on the market and the attributes of the product. Product variety is a strategic concept. It depicts the decisions on what products are developed and how they are offered to the customers. Typically product variety is divided as follows: standard products, product family, standard product with options, product family with many variants and products according to customer specification.

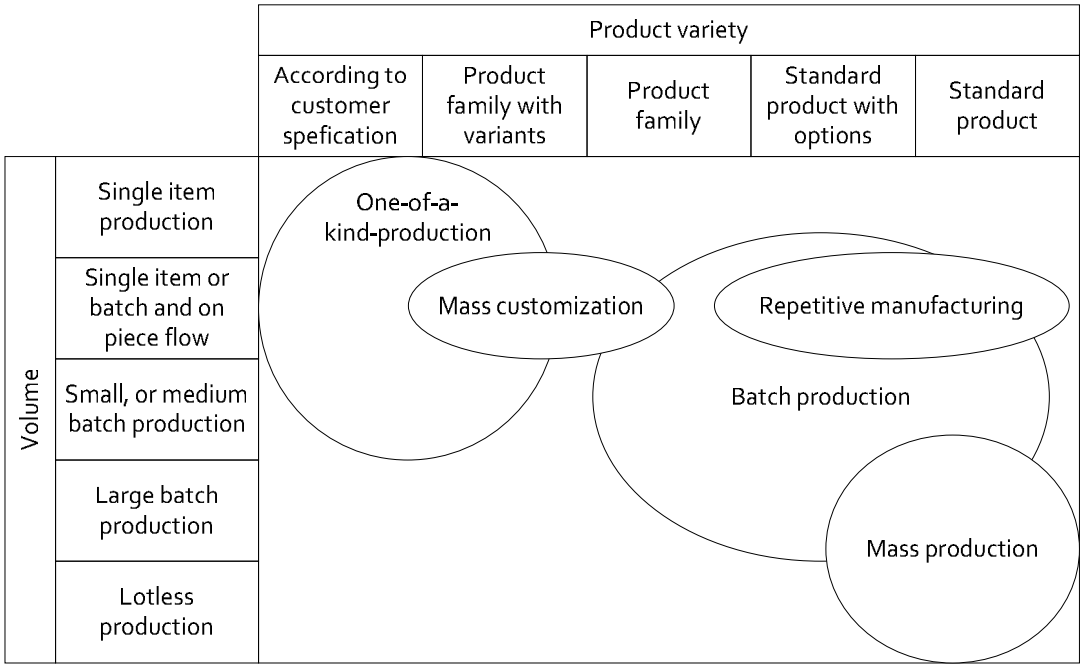

Figure 9. Categorization of production types (from Schönsleben 2009: 385).

The evolution of markets, society, operational environment and customers' needs has affected the development of production and production systems. It is envisioned that future production is high-tech, flexible, clean, safe, highly skilled and society-driven. The paradigms that have been drivers for the evolution of produc-

tions systems and production technology are portrayed in Table 2. (DG Research 2003: 22)

Table 2. The evolution of production paradigms (from DG Research 2003: 22).

Paradigm	Craft production	Mass production	Flexible production	Mass customization	Sustainable production
Paradigm started	~1850	1913	~1980	2000	2020?
Society needs	Customized products	Low cost products	Variety of products	Customized products	Clean products
Market	Very small volume per product	Demand > supply Steady demand	Supply > demand Smaller volume per product	Globalization Fluctuating demand	Environment
Business model	Pull *sell-design-make-assemble*	Push *design-make-assemble-sell*	Push-Pull *design-make-sell-assemble*	Pull *design-sell-make-assemble*	Pull Design for environment-sell-make-assemble
Technology enabler	Electricity	Interchangeable parts	Computers	Information Technology	Nano/bio/material Technology
Process Enabler	Machine tools	Moving assembly line & DML	FMS robots	RMS	Increasing manufacturing

Jacobsen et al represent their model for a production system (2002: 405-406). The model (Figure 10) depicts the elements that compose the production system. These elements are human resources, technology, information and organization. All of the elements are equally valued, and if any one of these elements is not balanced, it affects the others. The model also portrays the stakeholder groups of the production system.

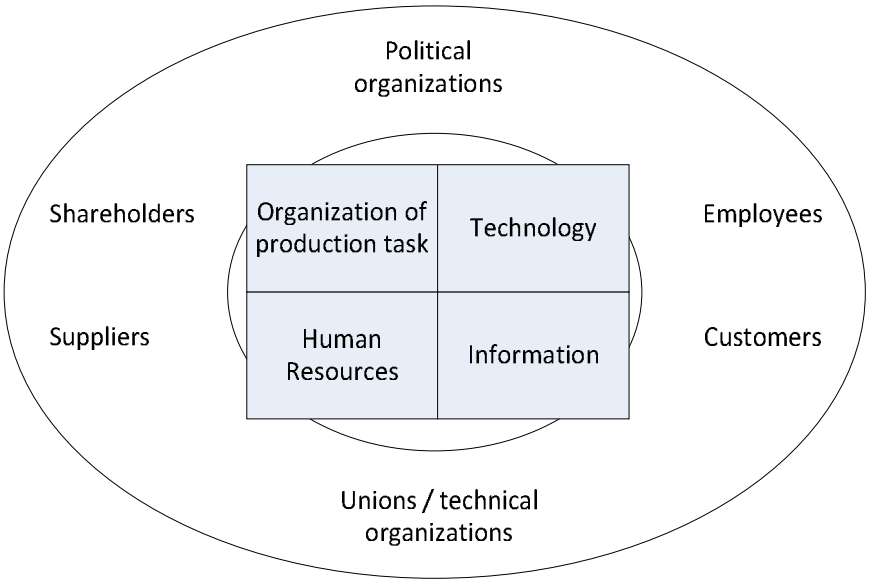

Figure 10. Elements of a production system (from Jacobsen et al. 2002: 406).

Jacobsen et al illustrate how *human resources* are key resources responsible for development, planning and production. Human resources define the qualifications and competencies that are present when a production system includes employees. Qualifications (Clematide and Hansen 1996, Jensen 1997) are divided into three groups: personal qualifications, technical qualifications, and general qualifications. Knowledge gained using competence becomes a qualification.

Jacobsen et al say that the *technology* element enables us to produce parts in the company's production system. Technology is also the last element, which is left in the production system if the production is closed, and there are no human resources left.

The *information* element gathers the other elements together in the production system. The other elements are dependent on it because all important data and information is in the information systems. The data is converted into information for example for human-centred or computer-centred decision-making. The information system conveys for example, the right data in the right format (i.e. structured data) to the right person and place at the right time (i.e. communication). The right data in the right format means that the data is uniform and personalized before it is presented to the right user. (Lutters, Wijnker and Karls 1999: 385 and Jacobsen et al 2002: 407)

In the element *Organization of the production task*, the company's way to plan and organize production is defined. This element concentrates on the use of human workforce. The management plans whether employees should work in

groups, teams or as individuals. Should they be responsible for the whole process or only a part of it? This element is very important because it encourages creativity and increases and enriches work. (Jacobsen et al 2002: 408)

The production system is a complex entity made up of people, technology, case-specific factors and processes. There is a need for criteria for evaluating the performance of a production system. Jackson proposes the following criteria (Table 3) based on White's[1] classification of performance measures. (White 1996: 45-46; Jackson 2000: 86-87)

Table 3. Performance measures for a production system.

Performance measure	Variables
Quality	Test yield or pass rate Amount of rework and defects Product reliability Component and material quality
Cost	Costs of poor quality Design costs Distribution costs Manufacturing costs Overhead costs
Flexibility	Product flexibility Volume flexibility Product mix flexibility Process flexibility Supplier flexibility
Delivery dependability	Percentage of on-time deliveries to customers Percentage of on-time deliveries from suppliers Percentage of accuracy in delivered amount from suppliers Average delay of orders Amount of re-planning
Speed	Through-put time Operation time Time-to-market Component delivery time Response time
Innovativeness	Average time between innovations The amount of generated new ideas Percentage of successful development projects Creative time for developing new ideas Motivation for developing operations

[1] White's selection of performance measures is based on study made by Vickery, Droge and Markland (1993: 438).

5.1 The design model for a new production system

The efficiency of earlier production systems was based on frozen product constructions, long production batch sizes and push-strategy. During the last twenty years the emergence of mass customization and platform based product structures has led to a new situation. Also paradigms, methods and phenomena such as lean, extended enterprises (see Browne & Zhang 1999, 32), multi-organization networks (Iakovaki et al. 2009, 3) outsourcing, pull-strategy and optimized production technology have brought new challenges to production system design.

There are variables that need to be noticed in the design of production networks and systems. Schönsleben (2009: 383-384) presents in his article the following variables.

1. Demand volatility is a concept for describing the distribution of demand over a certain period.
2. Supply chain vulnerability relates to disruptions in supply chain that are originated from supply chain participants or the macro-economic environment.
3. Necessity for economies of scale pertains to the level of the manufacturing costs.
4. Demand for consistent process quality refers to the company's ability to satisfy customers' need when there is a difference in process quality.
5. Customer proximity applies to the fact that to sell a product it is practical to place the value-adding processes close to the customers.
6. Market specificity of products deals with different market-specific requirements such as voltage, electrical connections, packaging, and documentation.
7. Customer tolerance time tells the time span the customer will tolerate from the date of the order release to delivery of the product.
8. Value density it is a concept for measuring transport costs, for example item costs per kilogram or cubic meter.

The key principle in production system design is to integrate it seamlessly with the product development process. Other interest groups like service providers and equipment suppliers have to be involved in product development so that they get adequate information about the product. Usually information is exchanged in certain phases (milestones) of the product development process.

The design model for a new production system (Figure 11) was developed in the KEMO-project. The model is based on general theories, models, and principles and also on company specific needs, circumstances, and products.

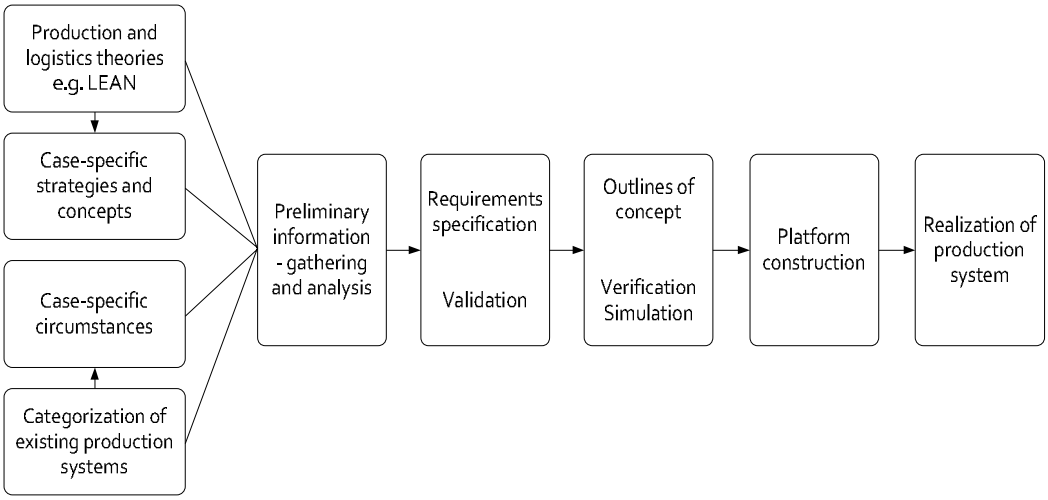

Figure 11. The design model for the new production system.

The basic assumption is that with help of the design model a competent production system can be implemented. It is also good to recognize the fact that the production system is a complex entity of interconnected facts and items.

The complex starting points demand that the preliminary information (see Christodoulou et al. 2007, 10-11) has to undergo exhaustive categorization and analysis, which results in an integral knowledge base. The next phase results in requirements specification and validation. The requirements specification can then be evaluated by the Kano model. The third phase produces outlines for the concept. The result is then verified and simulated. In the fourth phase the platform of the production system is constructed. Typical electronics and engineering assembly lines are constructed in the supplier's facilities. The assembled lines are tested during the construction. The prototype line is then further developed in the final assembly line. Before delivery to the end-customer, some of the customer's personnel are trained. The fifth phase is composed of the following actions: final layout of the production system, operational tests, trial runs and final implementation.

5.2 Manufacturing Footprint

There are 3 levels to the manufacturing footprint: manufacturing system, plant and manufacturing network level. The manufacturing footprint of a firm can be defined by its products and processes, by assigning specific products and process into specific plants within the manufacturing pool. The process that gives advice to improving the footprint involves 4 key steps: mapping existing manufacturing

network, diagnosing, optimizing and continuous improvement. (Cheng, Farooq & Johansen 2009: 11).

5.2.1 Manufacturing Footprint

Reconfiguring the global manufacturing network is a daunting task, but the structure presented by the Cambridge and Karlsruhe institutes yields successful cost savings. When deciding which process to choose, there are some things to consider. Karlsruhe institute's process is better suited for small or medium sized companies while Cambridge institute's process is suited for large firms. Cambridge's approach is more extensive utilizing "less level detail" with a focus of deliberation and agreement among decision makers. Karlsruhe's approach concentrates more on the where question and delivers more detailed analysis. (Grallert, Fleet, Lanza, Moser, Shi & Ude 2010: 16)

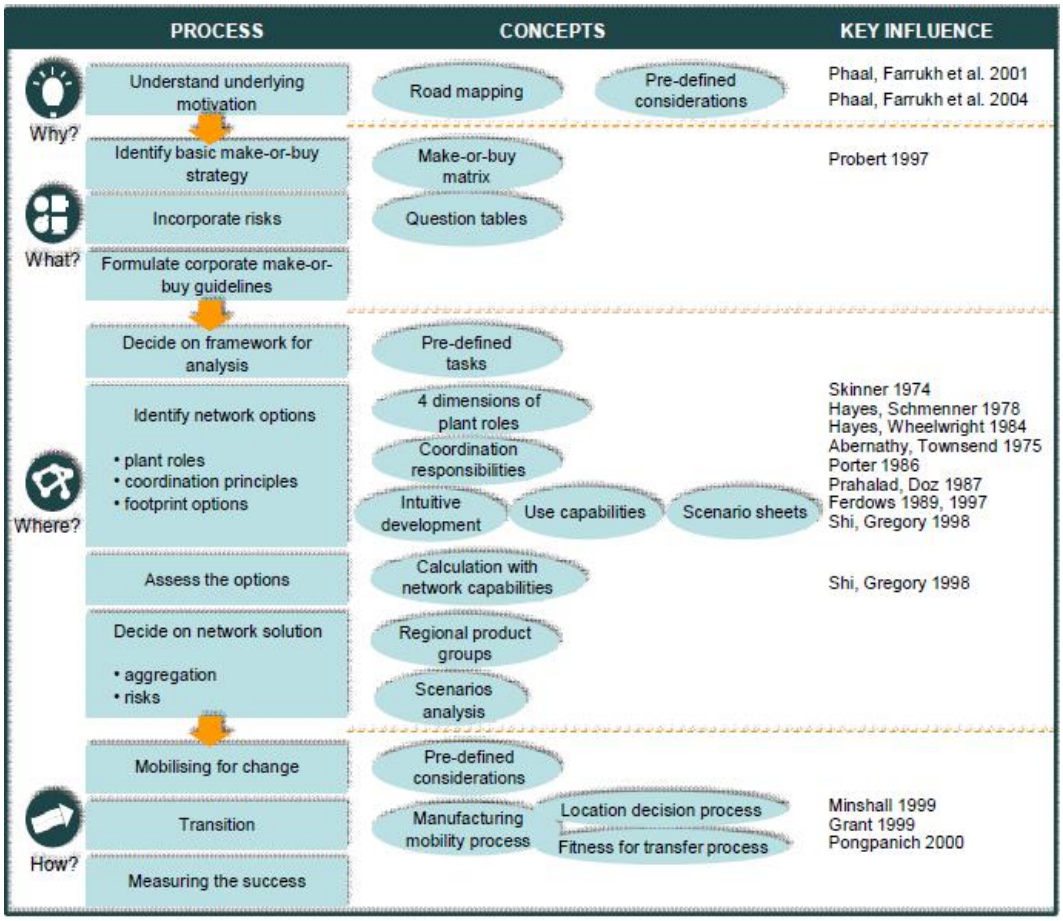

Figure 12. Cambridge's process, concepts and key influences (Grallert et al. 2010: 10).

Christodoulou et al 2007 of the Cambridge institute, shown in Figure 12, proposes a method which addresses four underlying areas: why, what, how, and where, of the firm. The questions are understood to be re-addressed continuously:

> WHY is it necessary to reconfigure the global manufacturing network? WHAT should the company make in this network? WHERE should plants be located and interconnected with each other? HOW can the transition be realized? (Grallert et al. 2010: 4).

Karlsruhe's institute process that is championed by Ude et al, shown in Figure 13, proposes an alternative measure for reconfiguring the manufacturing network. Its objective is to diminish the effects of uncertainty and change to decision-making. (Grallert et al. 2010: 11).

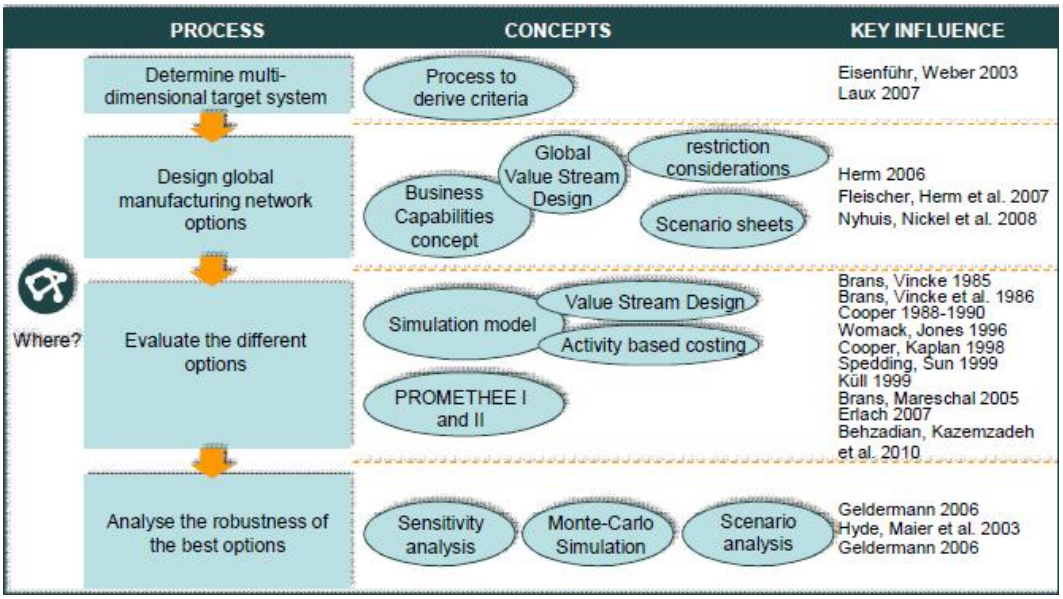

Figure 13. Karlsruhe's process, concepts and key influences (Grallert et al. 2010: 16).

When choosing a configuration method, there are 4 areas that could be helpful:

> number of product lines, amount of existing and future sites, available and capable resources within the company to perform the analysis and official and unofficial power distribution within the company. (Grallert et al. 2010: 20- 21).

The Cambridge process focuses on the design of network options rather than on assessing these alternatives where various product lines are assessed individually and subsequently aggregated. Meanwhile, the Karlsruhe process lacks a clear strategic vision but focuses on one production line where network alternatives are assessed through intricate math models.

5.2.2 Strategic Manufacturing and Sourcing Roadmap

As the manufacturing strategies change, firms will need management staff capable to cope with the adjustments. Managers have trouble implementing manufacturing strategies based on given objectives. There are many scenarios to consider. When growing from a single factory to a large-scale operation such as an international manufacturing network, consideration should be given to product, manufacturing capabilities, geographic advantage as well as network strategies of the firm. (Cheng et al. 2009: 2).

Configuring changes to plant activities or functions can have a ripple effect throughout the supply chain. The location of plants may have logistical gains that are unrelated to its competence. Plant competency is linked to "production, supply chain, and development." (Grallert et al. 2010: 3).

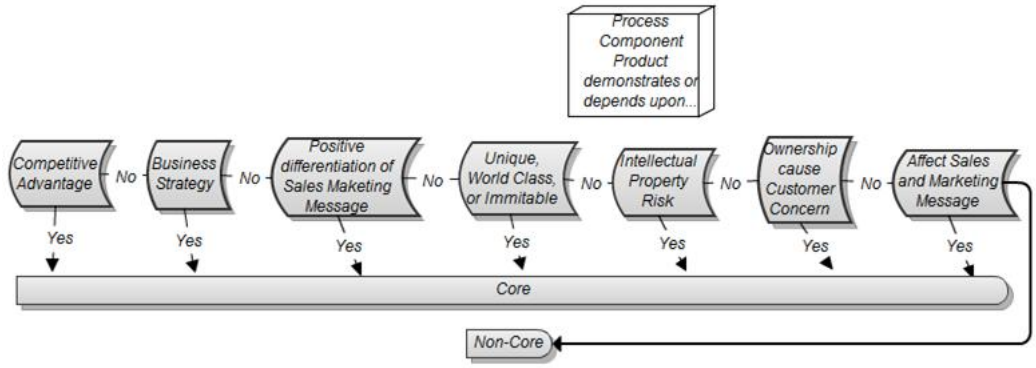

Figure 14. Core Screening Flow Chart (Abu-Khalil 2005: 59).

Abu-Khalil presents a process firms can apply to help optimize their manufacturing footprint. The Core Screening Flow Chart in Figure 14, slightly edited and redrawn, first screens out manufacturing operations and decides whether to sustain or outsource either core or non-core activities. The answer "yes" implies that the process component or product component is core; the answer "no" indicates that the component is non-core.

The roadmap in Figure 15 determines if it is possible to achieve the vertical integration strategy. The goal is to streamline the manufacturing process by perfecting core activities. The process of Figure 14 is the precursor to the processes in Figure 15. Managers decide what processes and functions are core or non-core in steps 1 to 3. Steps 4, 5 and 6 decide whether to outsource or make in-house. The core activities that are underdeveloped are outsourced or termed "split-milk". In step 7, the products or processes that are vital to the firm should be nourished with investment to become world class capabilities. Finally, step 8 performs the

right distribution of funds, resources and management support. This roadmap covers project planning and management and manufacturing capabilities. (Abu-Khalil 2005: 41-46).

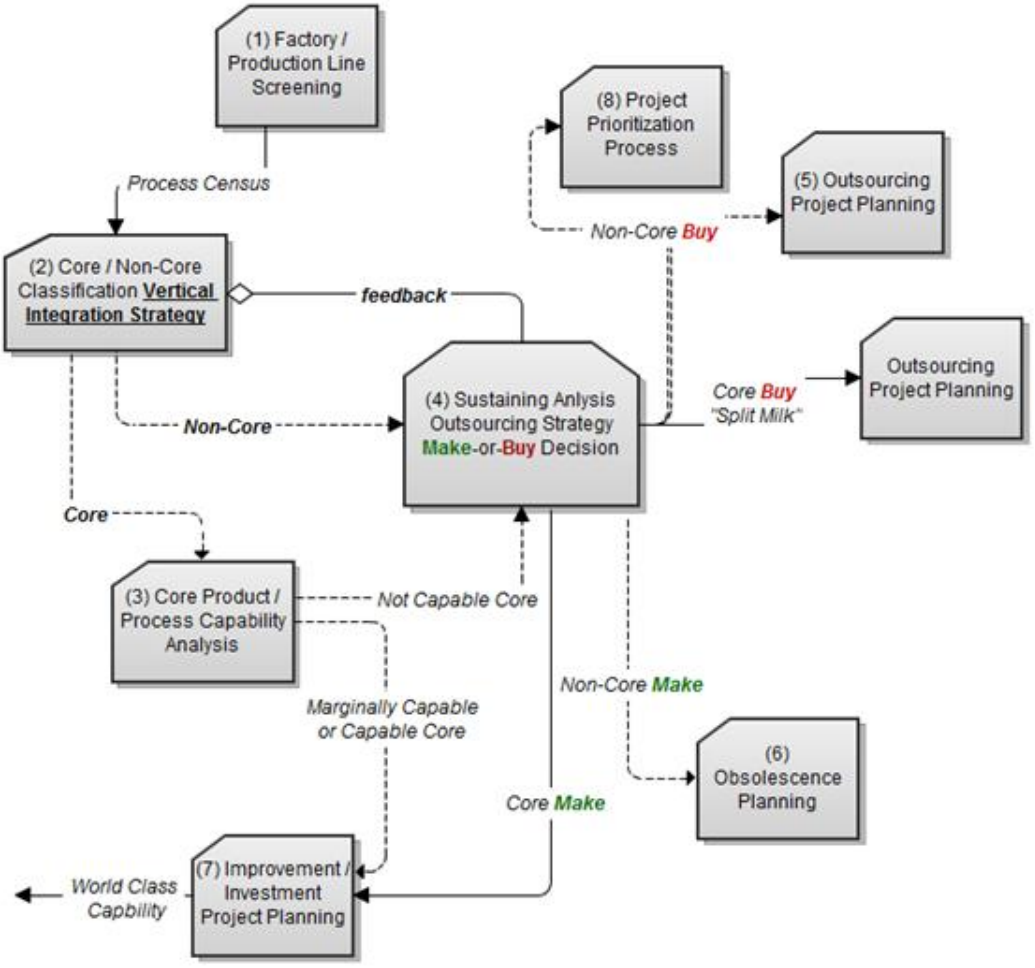

Figure 15. Strategic manufacturing and sourcing roadmap (Abu-Khalil 2005: 41).

Organizations should detect and plan for a crisis. Prevention and planning can be done through development of information sensing capabilities that process an inventory of sources which monitor in real-time the changing business environment by connecting the information through visualization of trends and patterns. This step can also be done through simulation. Simulation involves "practicing routines, response, and techniques" and allows for recognition of response capabilities and external entities, which should be coordinated smoothly. (Desouza 2009: 39- 40).

Factories tend to become unfocused because they try to accomplish too many objectives simultaneously. Process industries [chemical, paper, metal] are more

focused than discrete-part manufacturers [machinery, electronics]. Firms face different circumstances; therefore firms should not employ a single manufacturing strategy for all plants.

There may be over 200 variables in the production system. Decisions can be structural [capacity, facilities, technology, vertical integration], and infrastructural [quality, production planning, organization, work-force policies, performance measurement]. Visualization of the process through a causal map or network would be beneficial to managers because it would help spot alternatives. The tool for action plan selection (TAPS) supported by a software tool was developed to illustrate the connection between production variables more succinctly to managers. Although it takes approximately 4 weeks to setup, software such as TAPS can be very helpful in configuration of the Cambridge or the Karlsruhe style processes. It will enable efficient use of managerial time post implementation; the most crucial elements would be easily distinguishable. (Platts & Tan 2009: 612).

5.2.3 Production and Manufacturing Flexibility

The firm's strategic dimensions are for example, the business and functional strategies. Any plan that management decides in the corporate strategy must fit with the business and the functional strategy in order to achieve good performance results. Manufacturing flexibility is imbedded in the functional strategy. In the business strategy, the manufacturing flexibility alignment is achieved by either a differentiation or a cost leadership strategy.

A differentiation strategy does not rely on lower execution cost; it relies on products and services. This requires studying buyer behaviour and buyer needs. The differentiation strategy is gained through "distinctive features, timely customer service, rapid product innovation, technology leadership, customer reputation and engineering design and performance". Also one has to, "timely develop new products, adjust the product yield in accordance with changes in customer requirements, increase volume flexibility and mix flexibility". (Xie et al. 2009: 553-555).

Xie et al states that to obtain cost advantages, the cost leadership strategy requires the total value chain cost to be cheaper than the total cost of competitors. Achieving this strategy compels the value chain to remove high cost operations and perform those tasks more efficiently than competitors. Then volume flexibility has significant impact on performance; thus it achieves an economy of scale. Economies of scale lower costs as production and utilization increase through practice. It should "adjust volume in accordance with demand to achieve low cost." A

mixed flexibility and labour flexibility have no significant impact on performance with the cost leadership strategy (Xie et al. 2009: 553–555).

Manufacturing flexibility and low-cost strategies avoid the need for volume and mix flexibility. Xie et al examine that a differentiation strategy improves the firm's internal flexibility and a cost leadership strategy improves the firm's external flexibility. (Xie et al. 2009: 552–553).

5.2.4 Outsourcing

Vertically, looking towards the emerging markets will not resolve the escalating costs; these markets may actually increase costs. Emerging markets could negatively affect costs in ways that are often overlooked. They include problems with quality, visibility, piracy and intellectual capital theft. It becomes very difficult to protect intellectual property when firms pursue outsourcing endeavours.

Outsourcing

The disclosure of intellectual property (IP) can come about from within the firm or from the firm's part-manufacturing suppliers. Prevention of IP leaks can be from "e-mail, instant messaging and network protection, role-based data access, as well as researcher tracing systems." Patents allow for legal recourse through compensation. Kim et al proposes partial outsourcing as another preventive measure. Its aim is to only outsource parts of the product, and the most important features will be performed at the in-house factory. Optimization of the outsourcing objectives is simulated for IP, manufacturing costs, discount for outsourcing, cost penalty for manufacturing features from base parts etc. showing all possible scenarios on a Pareto chart. (Kim, Hamza & Saitou 2009: 124–128).

A Pareto chart analyses the quality control by plotting the frequency of events in descending order, which helps depict the most critical areas. Although real products will produce many scenarios, the Pareto optimal solutions, when plotted with software such as MS excel, are fewer but significant. The two significant scenarios are in all parts and features outsourced (min production cost, IP leak risk high) or outsourcing all but two critical features (decrease IP leak 31% and production cost 6.4% compared to the former choice). (Kim et al. 2009: 124–128).

The distance of the emerging markets from onshore manufacturing is quite far, therefore shipping products in a timely and responsive manner to customers is difficult. The cost of shipping the products also increases along with the fluctuating currency rates. (Ferreira & Prokopets 2009: 1).

While a significant advantage can be gained by getting closer to the customer base through offshore manufacturing, this does not offset all other problem areas. Manufacturers become shortsighted by choosing the readily available cost components and failing to see different manufacturing or sourcing options. This implies that management may do what seems best but does not actually look at the big picture when it comes to realized cost savings. (Ferreira & Prokopets 2009: 3).

Firms maintain in-house activities for core competencies and outsource the other non-core activities to contract manufacturers. Production with lower than 80% assembly line utilization increases costs and makes the case for outsourcing. The cost minimization, especially cheap labour, is at the core of contract manufacturing. (Salleh 2009: 150).

Building a factory abroad can be good for some companies but may not account for diversification, risk and flexibility. Flexibility can occur throughout the organization from labour to the entire network coordination. Factories that are diversified globally allow the company to readily adapt to uncertainties such as cost and demand. A manufacturing scheme that enables flexibility will be able to manage risk and subsequently costs involved reduce the manufacturing footprint.

In order for the supply chain to be effective and efficient, it must follow a structure. When put in place, this structure must regard the human capital as well as the cultural capital of a business because it affects the business's ability to generate profit and wealth.

The entire network from the company executives to the supply chain, the human resources and the suppliers must be properly aligned for the smooth functioning of the company. The competitive advantage is gained through the supply chain. The strategic integration of the value chain involves customers, suppliers, the product and the corporate, functional and business strategies.

Areas that affect the outsourcing decision include total cost modelling, technological selection, production architecture, knowledge capabilities, supply capabilities, capacity capabilities and strategic relevance. Problems preventing smooth outsourcing initiatives arise from market issues determining sources of supply and process technologies. The process consists of various stakeholders, such as product roadmap and sensitivity analysis, policies and organization where project priorities decide whether to go towards global or regional markets. (Abu-Khalil 2005: 37–38, 67–69).

Fine and Whitney discusses outsourcing for two types of dependency. Knowledge Dependency takes place when suppliers provide missing expertise in manufacturing a product. Capacity Dependency results from issues of time, cost, floor space or outsourcing promoted by management attention, despite expertise. The knowledge dependency is least desirable because it lowers the bargaining power of the firm while capacity dependency enables vertical integration if control is required. Fine and Whitney also discuss product architecture, if modular; outsourcing is more fitting when the product can be broken down into smaller parts. A matrix of the two was developed in Figure 16.

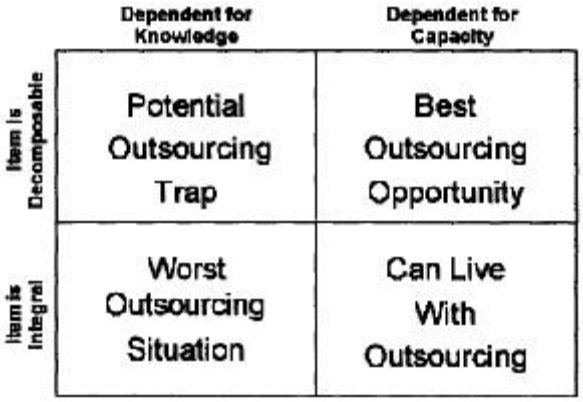

Figure 16. Matrix of Dependency and Outsourcing (Abu-Khalil 2005: 70).

It is easy to outsource the products that are modular, which implies that the products can be easily reverse-engineered, and have little proprietary information. If products or processes are vital, in order to be modular, it may encompass a ripple of other components in the outsourcing endeavour. Modular outsourcing activities are better than having intricate procedures linking these vital components. Mature products or industries become modular and develop modular architectures that enable firms to focus on areas that create value-added environments. (Abu-Khalil 2005: 68-71).

In 10 years there comes the point where around 85% of value added functions are outsourced at a car manufacturer called Alpha. Customer preferences are not as familiar to suppliers and will lead to changes in product design and launch as well as make product recalls and assembly problems more costly. The problem is that system integration of components and performance requires know-how about the car system. Know-how about the car system deters "navigating and balancing the various technical, cost and performance obligations¨ from realizing. Simultaneously, know-how is not dispersed among engineers so reliance is on suppliers. Attempts are made for co-location of core competencies at in-house factories, but this proves not to be as effective as learning by doing, which proves that "opera-

tional details and strategies are tightly integrated." (Zirpoli and Becker 2011: 59-63).

5.2.5 Benefits and disadvantages

Benefits

Abu-Khalil writes that outsourcing improves company focus on core activities. The non-core activities may lose their value through inattention and thus can potentially become more productive if they are outsourced. Outsourcing makes capital funds available by trimming the excess costs due to non-core activities. It also allows more resources to be available to meet demand and capacity.

Problems facing outsourcing

There are various areas in the supply chain that can become problematic through outsourcing. Companies tend to only account for product and service costs while total costs may be ignored. Finding suitable suppliers when language barriers obscure the acquisition of technical specifications is a serious problem. The management style may require adjustments or retraining, and product counterfeiting may not be treated as a major problem by local authorities. (Farooq, O'Brien & Johansen 2008: 11).

Some of the disadvantages to outsourcing include proprietary information loss, hold-ups (locked in a market at a supplier price), incompatibility because of difficulty or expense arising from integrating components at the final product assembly, and loss of control caused by external component purchases which restrain changes or escalate costs of the products.

Problems preventing smooth outsourcing initiatives arise from market issues determining sources of supply and process technologies. The process consists of various stakeholders such as product roadmap and sensitivity analysis, policies and organization where project priorities decide whether to go towards global or regional markets. Outsourcing drives firms to disintegrate. Make or buy decisions help firms choose whether to maintain vertical integration or to disintegrate. (Abu-Khalil 2005: 37–38).

Vertical Integration

Abu-Khalil states that operating strategies enable the firm to become successful and maintain a competitive advantage. These strategies allow the firm to adapt to a proportional level of vertical integration. Vertical integration is a management style covering different firms whose supply chain has common ownership.

Vertical Integration illustrates the restrictions or degree to which the supply chain's suppliers and customers are owned by the firm.

> The theory of vertical integration is valuable when performing a Porter's Five Forces strategic analysis of a firm's position within an industry structure, particularly with respect to issues such as market power, bargaining power, hold-up, double marginalization, and the ability to extract maximum profits from within the value chain. (Abu-Khalil 2005: 50).

Knowledge of the firm's own process technology as well as its competitors is a key element to vertical integration or disintegration decisions. Firms utilize process technologies, such as Wärtsilä's automation systems, to aid management in simplifying industrial operations. The process technology's maturity should be scrutinized across all industries to aid in resource allocation for technology development as well as in evaluating its migration to other industries. (Abu-Khalil 2005: 67–69).

Table 4. Reasons to Vertically Integrate and Disintegrate (Abu-Khalil 2005: 51).

Reasons to Vertically Integrate	Reasons to Vertically Disintegrate
– Reducing coordination with the supply case and gaining greater control of operations – Capturing upstream or downstream profit margins – Gaining access to downstream distribution channels or upstreaming limited sources of supply – Giving investment in highly specialized assets for which general supplies or customers may be unwilling to invest – Expanding portfolio of core competencies	– Increased risk exposure – demand fluctuation – Higher invested capital – Diffused management focus – Decreased firm flexibility

There are unpredictable economic consequences to vertical integration as well as high costs and inflexibility. As shown in Table 4, there are many reasons to vertically integrate. The firm will gain benefits such as expansion of core competencies, profits from both the upstream (suppliers) and downstream (customers) bases. It can also realize risk such as fluctuating demands and capital needs.

5.2.6 Make-or-buy

Make-or-buy aids operational strategies and develops the business strategy. Figure 17 shows that, when top levels of management or purchasing are responsible for the make-or-buy decision, it is most successful by a large margin.

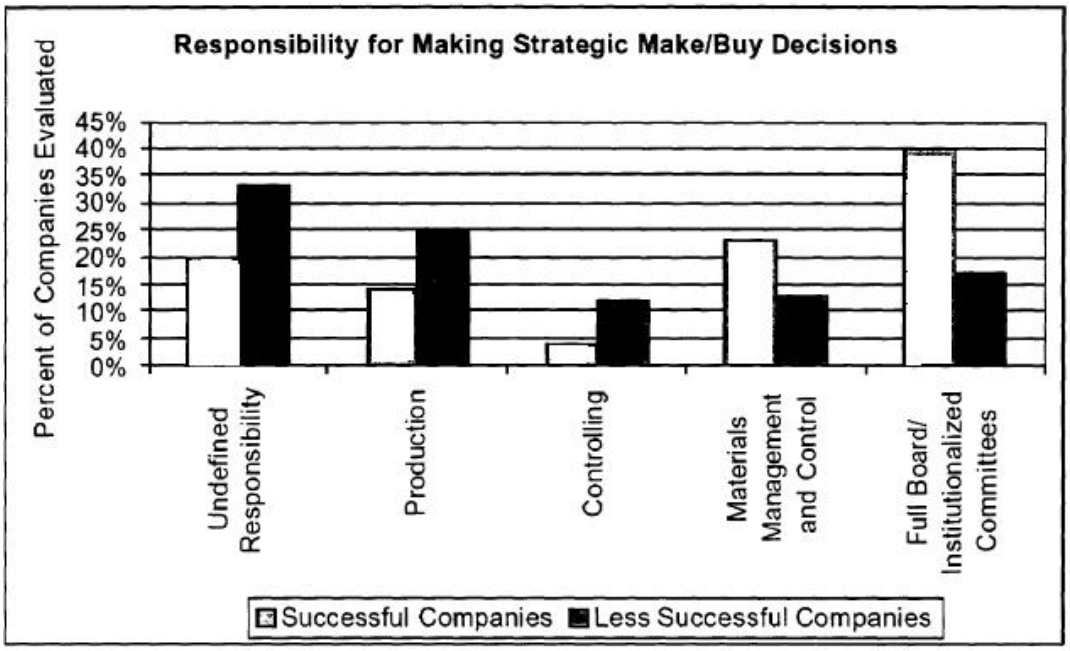

Figure 17. Who owns the Make versus Buy Decisions? (Abu-Khalil 2005: 110).

Make-or-buy from the market-structure theory states that supply and demand factors influence the firms control over inputs. The market structure theory accounts for suppliers, transaction costs and switching costs. (Abu-Khalil 2005: 67- 69).

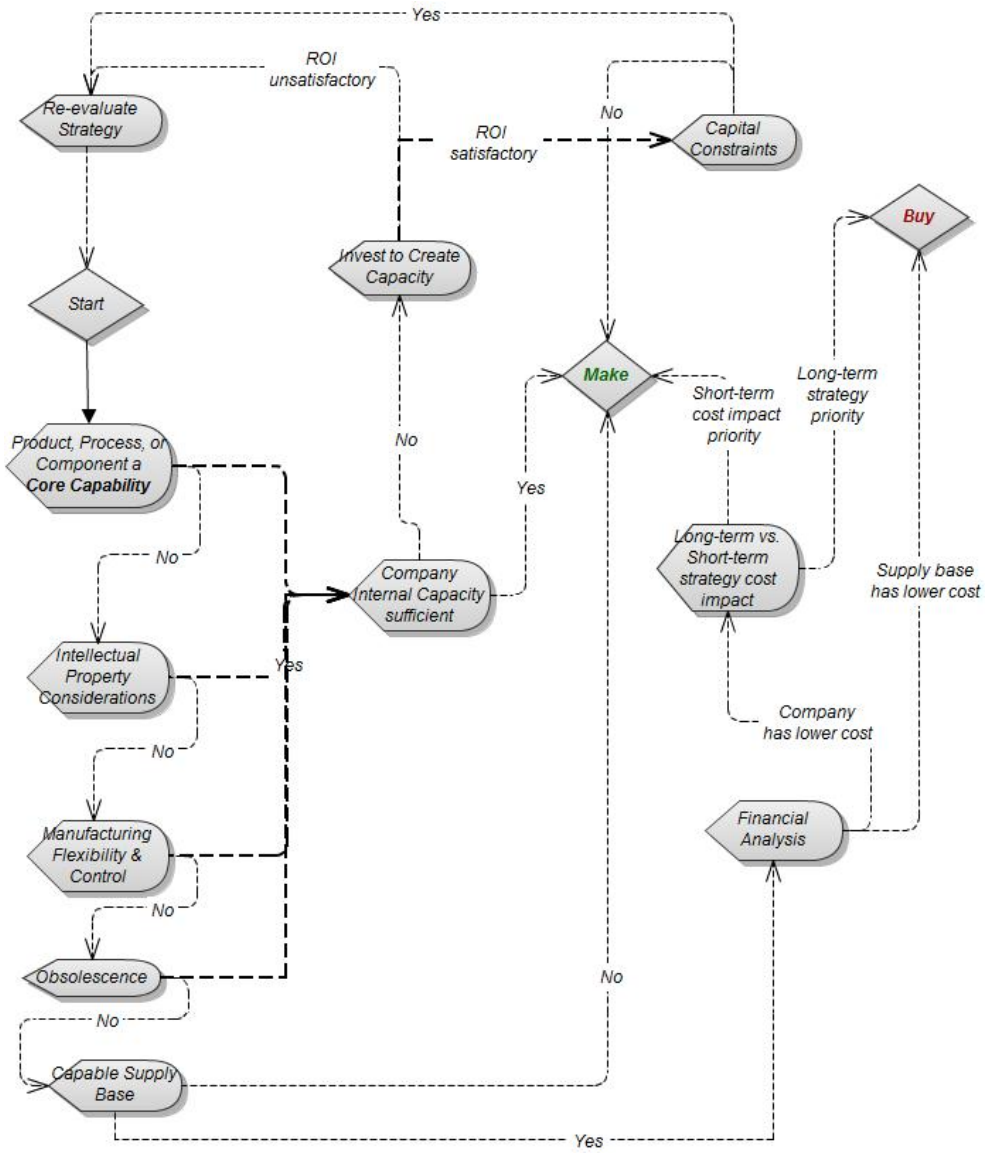

Figure 18. Make- or- Buy (Abu-Khalil 2005: 76).

In Figure 18, slightly edited and re-drawn, the shapes represent decisions or information consolidation points. First, a *core screening flow chart* is used to determine if the product, process or component is core. A decision of yes for core, IP, manufacturing flexibility & control and obsolescence leads the firm to decide if in-house manufacturing capacity is sufficient, otherwise the firm outsources or makes capital investment decisions. A decision of no leads to looking for decisions of suppliers able to take on the task, or otherwise to making in-house. Financial analysis is performed after all screens, to make sure that there are positive ROI assessments and a strategic consensus. Market conditions and trends influence the make-or-buy decision; thus companies that have a pulse on these situations with proper performance measures will have success.

6 SIGNIFICANCE OF PRODUCT DEVELOPMENT

The key factor for successful production process is the product development phase. During that phase the foundation for a successful production system is laid. The product development process is considered to be an iterative process, and the production start-up is also a process, which is gradually realized and defined. Carefully planned and implemented product development enhances the company's competitive and proactive capabilities.

The main function of product development is to build up and strengthen the competitiveness of a company. Usually a company releases new product versions or entirely new product families into existing markets.

Product development is typically redesigning existing products, making constructions cheaper, upgrading material and components and improving performance, usability and compatibility. Renewal of products and product portfolios gives the company an opportunity for reviewing and improving its services and competencies and therefore the whole corporate culture.

The product development process is divided into the following main phases (Figure 19). After each phase there follows decision-making based on the resolutions of the management team. After every phase certain questions need to be answered:

- Before product development: What is our product portfolio? In what phase of a life cycle are the products?
- Before product development: Is the process model clear to each party? Are the responsibilities clarified? How do the responsibilities spread during the products life cycle?
- After product specification: Does the product specification satisfy the needs and hopes of customers?
- After concept and system planning: Are basic solutions appropriate and feasible?
- After development: Do the functions and performance characteristics match the product specification?
- After detailed planning: Is the construction of the product fit for manufacturing, and maintainable?

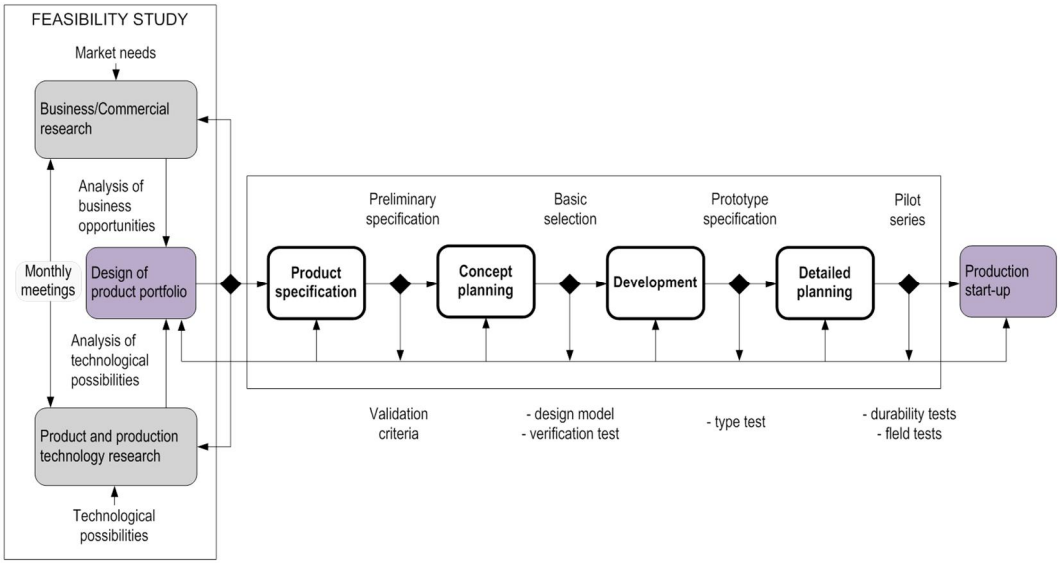

Figure 19. Product development process (adapted from Verho & Salminen 1994: 28-30).

Along with feasibility study phase it is purposeful to clarify how the new product satisfies the needs of customers. In Table 5 criteria for customer satisfaction are presented.

Table 5. Customer satisfaction criteria.

Company potential	❑ Company image ❑ Product and quality image ❑ Position on the market ❑ Economies of scale ❑ Continuity benefits ❑ Synergy benefits ❑ References ❑ Readiness for cooperation ❑ Resources ❑ Quality system ❑ Delivery process	**Product features**	❑ Technical standard ❑ Exterior features, finishing ❑ Performance characteristics ❑ Ease of use ❑ Fitness for different surroundings ❑ Reliability ❑ Safety ❑ Ease of testing ❑ Maintainability
Communications	❑ The availability of information ❑ The level of advertising ❑ Brochures, product documentation ❑ The ease of approach ❑ Contact persons ❑ Willingness for negotiation ❑ Transparency ❑ Negotiation atmosphere	**Service related features**	❑ Ease of ordering ❑ Constultation services ❑ Flexibility ❑ Realibility of delivery ❑ Design services ❑ Implementation services ❑ Maintenance ❑ Financing ❑ Complaints ❑ Training
Time-related factors	❑ Launch and access to the market ❑ Duration of product development ❑ Production time ❑ Reaction time ❑ Delivery time ❑ Lead-time	**Financial factors**	❑ Unit price ❑ Installation, implementation ❑ Operating costs ❑ Maintenance, development ❑ Maintenance costs ❑ Terms of payment ❑ Time savings ❑ Capital ❑ Overall efficiency

Verho and Salminen (1994) propose a practical checklist for improving product development. The items of the checklist are shown in Table 6.

Table 6. The board of product development manager (adapted from Verho & Salminen 1994: 28–30).

Simplify the product development process	✓ Recognize the key sub processes ✓ Find and remove the bottlenecks
Let the markets guide you	✓ Remember that customers value economic efficiency ✓ Respect the customer's process ✓ Take care of the expenses of manufacturing company ✓ Pay attention to manufacturing costs and lead-time ✓ Be prepared to pay for speed and quickness
Lay foundation for product development project in advance	✓ Lead inventing and innovating ✓ Don't get stuck in the "thinking phase"
Attend to organization and personnel	✓ Secure the sufficient manpower ✓ Include a generalist into the group ✓ Let the group lead itself ✓ Bend on formalities and rules
Make early checks	✓ Manage both technological risk and market risk ✓ Keep reserve

Each phase of product development produces outputs. The outputs vary depending on the field of industry. In Table 7 typical outputs of the product development process in the electronics industry are listed.

Table 7. Typical outputs of the product development process.

Phase	**Typical outputs**
Product definition	Product specifications Quality requirements Market specifications Preliminary purchasing specifications Preliminary capacity reservations
Concept and system planning	Product /system architecture Selection of basic technologies Design models and product layout Simulation and test results
Prototype development	Actual prototype Purchasing specifications Preliminary production specification Technical documentation Type test results
Detailed planning	Finalized documents Production specifications Bill of materials Durability test results Environmental testing (IEC68) Customer documentation Packaging documentation

Creation of links between product development and other processes, units as well as stakeholders improves the company's competitive and proactive capabilities. In course of the product development, competitiveness and its components are improved significantly. Product development can be seen as a project. Each project has participants from within the company and outside of the company. These participants include representatives from acquisition, purchasing, quality control, production, and marketing and also from major suppliers and subcontractors. This way of action is called integrated product development. Participants outside of the organization usually attend the design reviews. Product life cycles have become shorter and more rapid. This development emphasizes the importance of collaboration. In the '90s the paradigm of concurrent engineering was developed to answer the need for collaboration. The main principle of concurrent engineering is to overlap and parallel the processes.

Proper connection between product development and acquisition helps in the selection of competent suppliers and also in technological selections. Unconnected

processes cause bottlenecks for example in material and information flows. Linking the processes prevents the forming of bottlenecks between processes and units. Lack of links leads to sub-optimizing, which can cause unwanted competition within organization.

During the research interviews, following enabling factors for the linking were recognized:

– common culture
– shared vision and goals
– common models of operation
– uniform views about the overall processes
– understanding of different processes and their structure
– standardized processes revealing bottlenecks and deficiencies
– bidirectional information flows
– appropriateness and quality of information
– avoidance of information of overflow, "right information in the right place"
– integrated information systems
– links between concurrent and overlapping processes

Key areas of successful product specification

As stated above, product development is an essential part of building anticipative capabilities of an organization. To ensure that the foundation is solid, the product specification has to cover the following viewpoints (Figure 20).

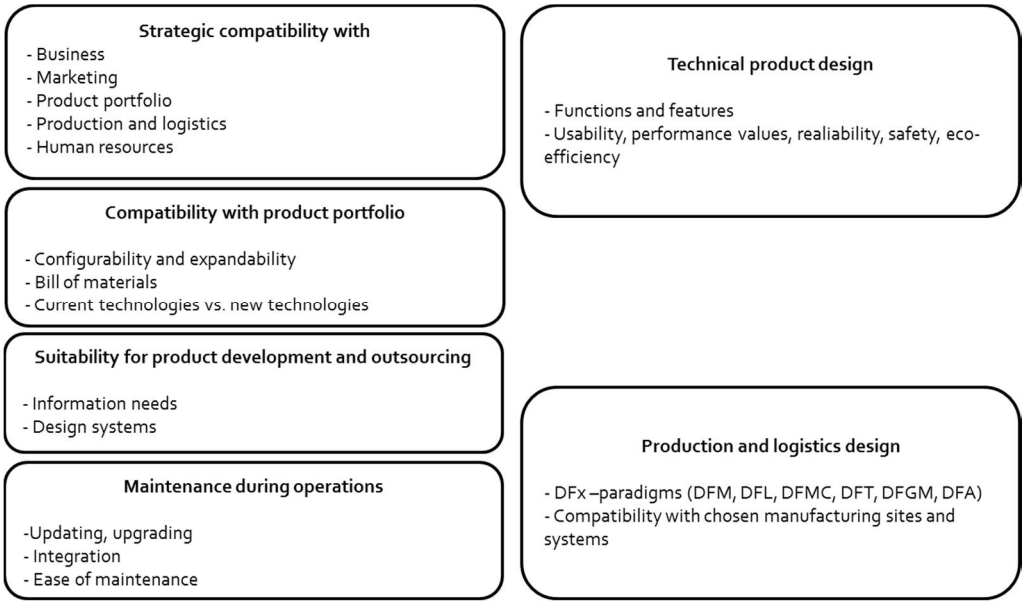

Figure 20. Key areas of product specification.

7 PRODUCTIONALIZATION CONCEPT

A successful production start-up is made of several components. To sum up all the factors, a systemic viewpoint is needed. The productionalization concept is introduced to satisfy the need (Figure 21). Even though each component can be examined independently it is good to keep in mind the fact that the components form a system in which every part has an influence on each other.

The concept presented in Figure 21, can be perceived as a progressively defined decision-making process. It consists of disquisitions, feasibility studies and concrete planning. It is a tool for recognizing potential risks and challenges. The concept gives an organization means to correct deficiencies beforehand. Application areas for the concept are the establishment of a new industrial site, renewal of an existing site and renewal of the production system. The concept presented in Figure 21 is a generalization and when applied in practice, each component of the concept has case-specific features that need to be recognized.

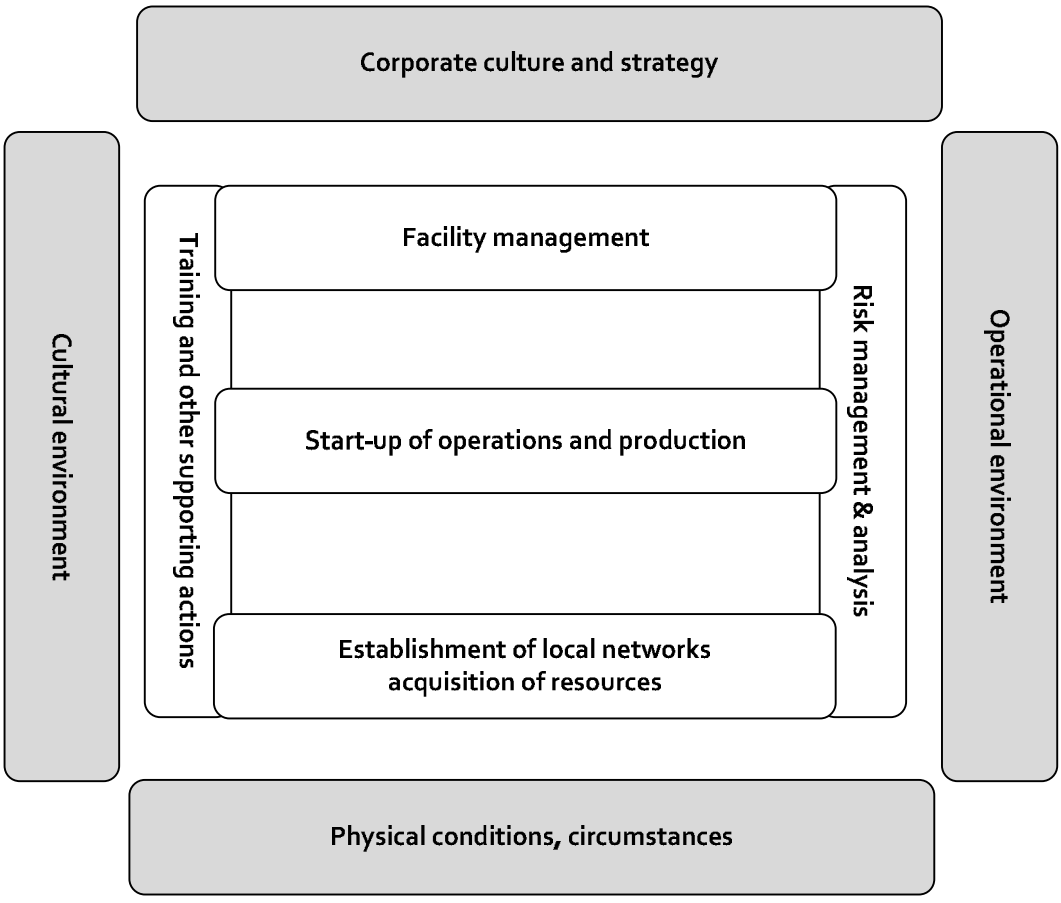

Figure 21. Productionalization concept.

On the outer circle there are contextual factors, which are the corporate culture and strategy, the cultural environment, physical conditions and the operational environment. The core of the concept consists of a three-part decision-making process and its two support processes.

Anyhow, it is important to recognize pertinent factors and special characteristics in advance. To ensure this, a thorough feasibility study is needed. After this validations and verifications can be carried out.

7.1 Training and other supporting actions

Training and supporting actions include for example, the following areas communications, information systems, documentation, orientation and training. These factors need to be reviewed as a whole. The traditional training and orientation are supported with the knowledge of local circumstances, institutional knowledge and directions of the local authorities.

Areas of professional training contain
- processes and products of the company
- production
- team work, production cells, project organizations
- quality control and management
- general knowledge of product development and its practices.

7.1.1 Training and knowledge transfer

During the project, a survey[2] about the knowledge transfer and training practices were made. Due to the small sample, in-depth generalizations could not be made. In the following paragraphs the results of the survey are presented.

The roles of company-arranged training and self-arranged training are important. The sources of knowledge besides company-arranged training were literature, Internet discussion forums and colleagues. The training included both language and cultural skills. Although the training was considered useful, there are things that are learned only in practice.

[2] The survey questions are adapted from Hermanson and Kilnes 2008: 48-50.

Respondent were asked to describe and evaluate the methods for knowledge exploitation. Evaluation results are listed in Table 8.

Table 8. Knowledge exploitation.

Please evaluate the following statements about knowledge exploitation. Scale 1–7 where (1) is not at all and (7) is very much.	
	Average
The company evaluated my experience abroad when I returned home.	2.67
I have been given the opportunity to hold seminars and/or workshops concerning my assignment abroad.	4.00
I have been assigned to a position within the company that takes advantage of my specific international knowledge.	5.67
I have been encouraged and inspired by my company to share and communicate my international knowledge in my everyday work.	5.00
My co-workers have been able to take advantage of and use the knowledge that I gained abroad in their own context.	5.33
I wrote a formal report on my mission abroad.	3.00
I am aware of the outcome of my mission abroad.	6.67
Colleagues are aware of the outcome of my mission abroad.	5.67

Respondents were asked to evaluate the methods used for knowledge transfer. Evaluation results are listed in Table 9.

Table 9. Knowledge transfer.

Please evaluate the following statements about knowledge transfer: 1 strongly disagree, 7 strongly agree	
	Average
Transfer of knowledge was difficult because my co-workers at home interpreted the knowledge differently.	4.00
Transfer of knowledge was difficult because the organizational culture (tradition, conservatism, power relations, fear of sharing ideas etc.) created barriers for knowledge transfer.	4.33
Transfer of knowledge was difficult because the structure (e.g. hierarchical, bureaucratic) of the company created barriers for knowledge transfer.	5.00
Transfer of knowledge was difficult because the differences between the home and the host country (legislation, taxation, public authorities, culture) created barriers for knowledge transfer.	2.67
Transfer of knowledge was difficult because the whole expatriation process did not work well in my company.	3.33
Transfer of knowledge was difficult because there were no formal procedures.	4.67
Transfer of knowledge was difficult because I had difficulties communicating my knowledge.	2.33

7.1.2 Managing multiculturalism

Start-up of operations in new circumstances requires paying attention to the cultural issues both at strategic and tactic levels as well as the operative level. The framework presented in Figure 22 can be used for specific planning of production.

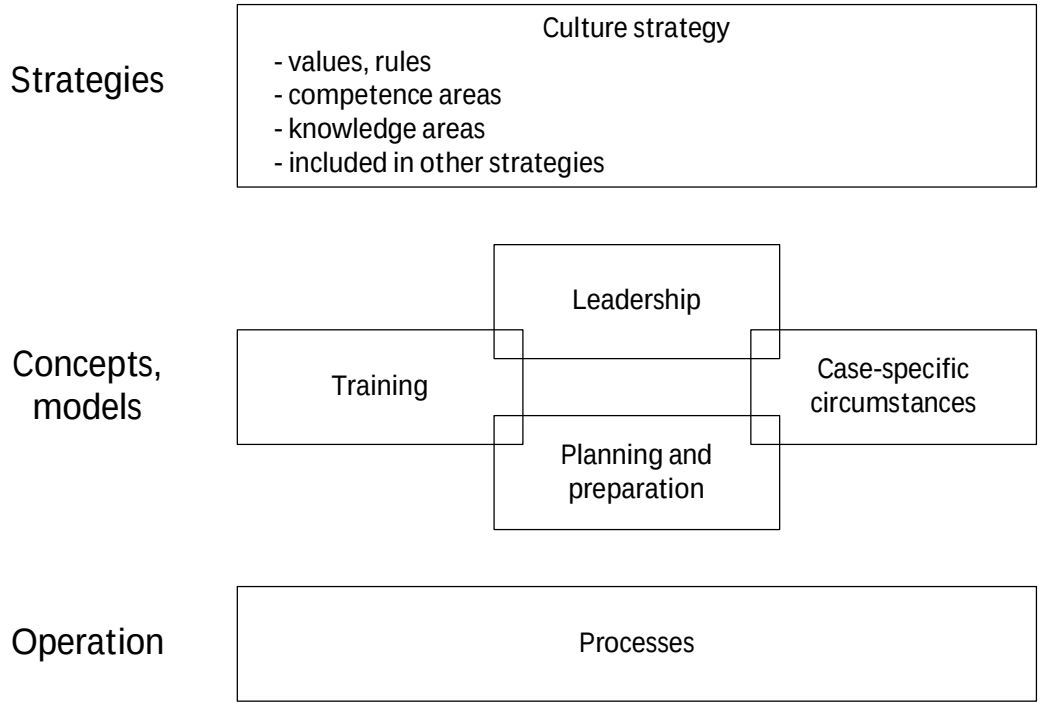

Figure 22. Culture framework.

Multiculturalism is included in the culture strategy (Figure 22.) and it needs to be fitted with other areas of strategy. The culture concept includes training and competence management, leadership development, research of case-specific factors and circumstances and also planning and preparation of concrete production. The concept is implemented at the operative level by a so-called cross-functional team. The team is staffed by experts from different fields and cultures.

7.2 Risk management and analysis

Risk management is a process, which aims to prevent potential risks and losses that they may be caused (Suominen 2000: 26). Risk management can be divided into four phases (Figure 23) (http://www.pk-rh.fi/pdf/pk-yrityksen-haavoittuvuus-analyysi-tyokortti).

Figure 23. Risk management process (adapted from http://www.pk-rh.fi/pdf/pk-yrityksen-haavoittuvuusanalyysi-tyokortti).

7.2.1 Preparation

The first phase covers organization-wide recognition and evaluation of risks. Usually this phase is divided into smaller segments. The second phase aims to remove the risk entirely. Normally this is not possible, so company has to find ways for decreasing the risk, transferring the risk for example to insurance companies or keeping the risk and preparing for it. The third phase focuses on preemptive actions for preventing and minimizing damages caused by potential risks. The fourth phase covers follow-ups and learning from past experiences and is considered to be the most important task of risk management (http://www.pk-rh.fi/pdf/pk-yrityksen-haavoittuvuusanalyysi-tyokortti).

7.2.2 Vulnerability analysis

During the project risk analysis, a case study was carried out. The case study focused on project management in Africa. In the study, vulnerability analysis was used. Vulnerability analysis is a general and rough-level method for risk management. It produces a rough overall picture about the potential risks quickly and it can be easily widened. Vulnerability analysis consists of the following phases. (http://www.pk-rh.fi/pdf/pk-yrityksen-haavoittuvuusanalyysi-tyokortti.)

1. Risk recognition
2. Risk analysis and prioritization

3. Planning, implementing and following-up of development actions

The results of the risk analysis case study were analysed with the risk map framework. The Risk map is portrayed in Figure 24 (http://www.pk-rh.fi/pdf/pk-yrityksen-haavoittuvuusanalyysi-tyokortti).

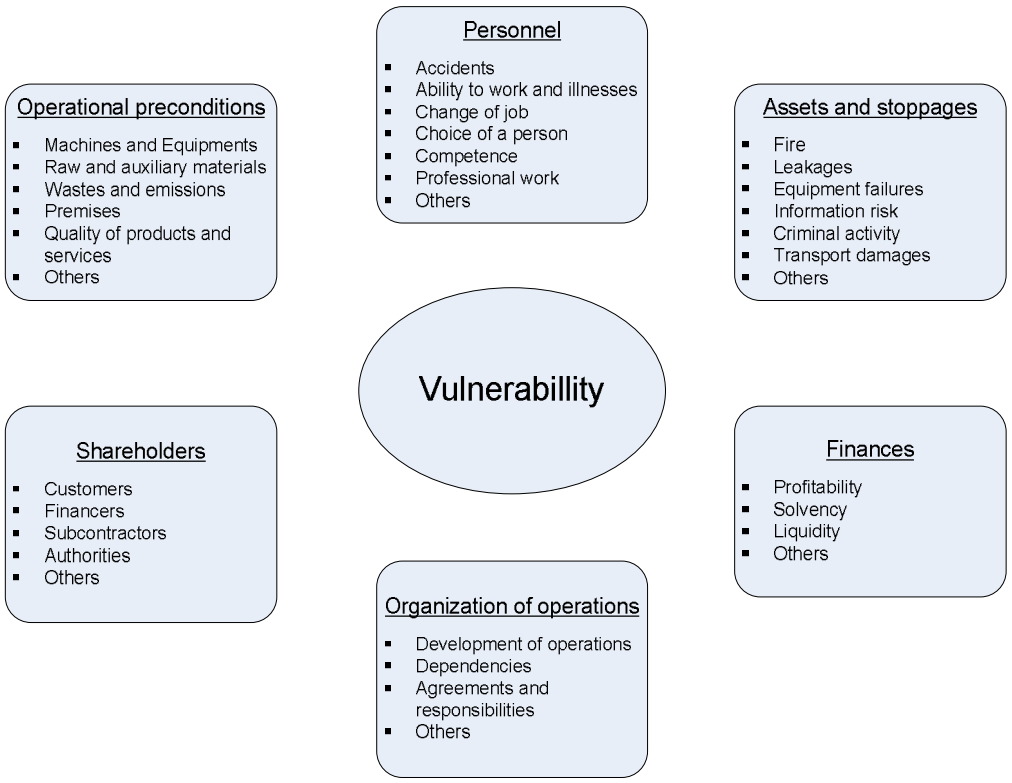

Figure 24. Risk map (from http://www.pk-rh.fi/pdf/pk-yrityksen-haavoittuvuusanalyysi-tyokortti).

7.2.3 Case description

The case study was carried out in a global company's Finnish office as an interview study. The company is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering the environmental impact. In the case study, the plan was to evaluate what kind of risks and other possible problems have to be coped with in a project that is executed in Africa but the customer is from Asia.

The project is a first of its kind, and the risks are different from those in earlier projects. The survey consists of three different interviews. In the first interview the process of risk mapping and evaluation and the company itself were dis-

cussed. In the second interview the discussion concerned the risks and problems in this case, and in the final interview a risk analysis and prioritization were made.

7.2.4 Summary of findings

In the case study a risk map in a challenging environment was drawn. That is why most of the risks focused on the area of Operational Preconditions. Some of these risks could also have been included in other fields of the risk map. The second important area was Organization and Operations concentrating on agreements and responsibilities. This was mainly done when there was a risk that the customer will terminate the project contract. The third area was Shareholders concentrating especially on the customer.

Key findings of Operational Preconditions:
- Design fault: wrong material volume and long time of delivery
- Site location: could be in the middle of nowhere
- Machines: low quality of local machines and expense of importing
- Sudden seasonal changes
- Poor infrastructure

Key findings of Organization and Operations:
- Faults in contract: the project is the first of its kind
- Failure in project execution
- In this case the project size is too small and it is not scalable with processes

Key findings of Shareholders:
- Customer could vanish
- Customer mistreats subcontractors
- In this project: the customer is in charge of purchasing and gets funds from the government

Usually in Africa a link between a company and authorities is very important because of various permissions. Often companies use a contact who knows the national customs to solve permission problems. In this project the customer is responsible for connections to the authority, which lowers shareholders' risks.

7.3 Facility management

Facility management (Figure 25) covers the life cycle of company's facility management. It applies to situations where entirely new facilities are planned and

built or situations where existing facilities are redeveloped for new production. The decision-making in productionalization has to be linked with decision-making in other processes. Traditionally factory designs were focused solely on layouts. Nowadays the role of material and service logistics of a network and concepts like smart factory have become more significant. Strategies, the productionalization concept and concepts of operations have an essential role in the realization of facility management.

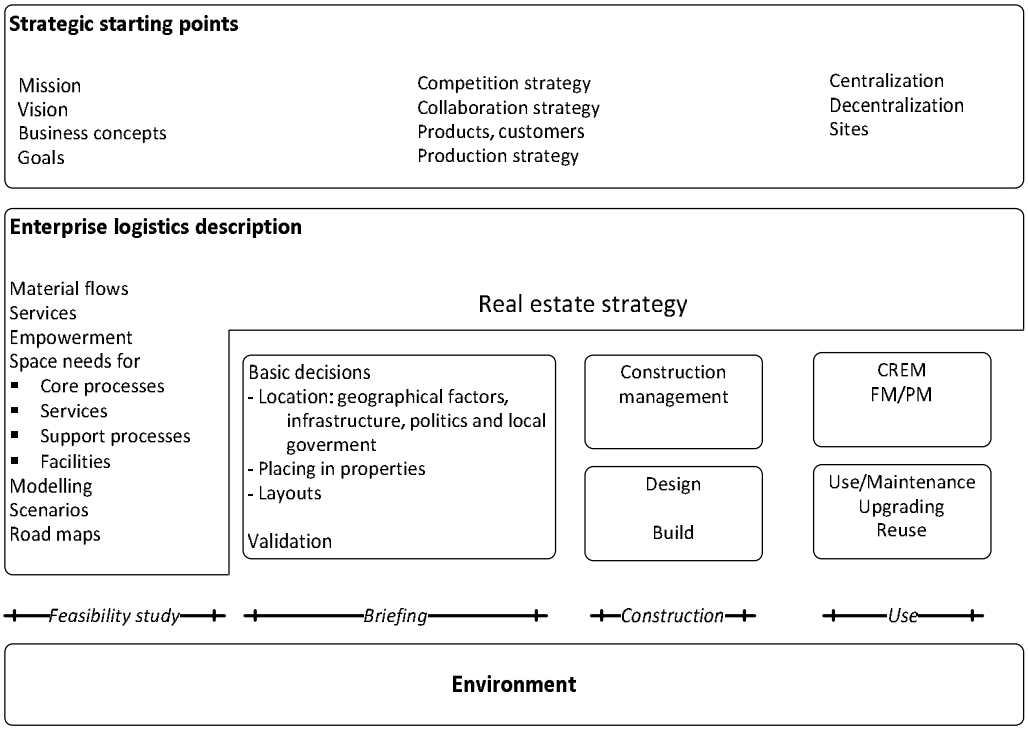

Figure 25. Facility management framework.

7.4 Establishment of local networks and acquisition of resources

Starting operations in a new industrial site requires local partners and networks. Partners that are involved in actual production are:

- sub-contractors
- suppliers
- service providers
- purchasing networks
- marketing networks
- sales and distribution networks

Also facility management, logistics and health care services are needed. Research and development activities must be closely integrated with local authorities, consultation and intellectual property right services and also benchmarking networks, to see how things are done elsewhere. Good relationships with industrial and trade organizations are important factors in running daily operations.

Logistics performance index

International trade has become more global. Logistics operators manage the trade by network of international supply chains. Globalization requires that logistic services need to be sophisticated, pushing for integration and diversification of services to help operate uninterrupted supply chains. The service providers who physically move products and goods have to integrated and work together seamlessly. Trade logistics performance has a direct influence on economic outcomes, such as trade expansion, diversification of exports, and growth. (Arvis et al. 2010: 1–5)

Logistics performance index (LPI) is a tool for assessing logistic performance of countries. It is a multidimensional tool that evaluates the following six aspects of the current logistic environment. LPI surveys are conducted by the World Bank. (Arvis et al. 2010: 1–5)

- Efficiency of the customs clearance process.
- Quality of trade and transport-related infrastructure.
- Ease of arranging competitively priced shipments.
- Competence and quality of logistics services.
- Ability to track and trace consignments.
- Frequency with which shipments reach the consignee within the scheduled or expected time.

In the next table the Logistics performance indexes of the countries that were discussed in “Cultural Issues Study” are listed.

Table 10. LPI indexes of countries discussed in "Cultural Issues Study" (from Arvis et al. 2010).

Country	LPI	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Finland	3,89	3,86	4,08	3,41	3,92	4,09	4,08
Italy	3,64	3,38	3,72	3,21	3,74	3,83	4,08
South Korea	3,64	3,33	3,62	3,47	3,64	3,83	3,97
China	3,49	3,16	3,54	3,31	3,49	3,55	3,91
Thailand	3,29	3,02	3,16	3,27	3,16	3,41	3,73
India	3,12	2,7	2,91	3,13	3,16	3,14	3,61
Russian Federation	2,61	2,15	2,38	2,72	2,51	2,6	3,23
Middle East & North Africa (regional average)	2,6	2,33	2,36	2,65	2,53	2,46	3,22

7.5 Start-up of operations and production

Production start-up in a global company is a multi-phased process. Typical phases are:

1. Zero-series for mass production products and mass customization products. The aim of this is to ensure that the products are fit for production and to train production personnel and to run production equipment in.
2. Start-up of primary production in the parent factory. Case-specific adjustment of ramp-up speed is needed.
3. Transfer of production to the company's own offshore sites. Transfer decisions are based on production strategies and programs.
4. Transfer of production completely or partially to sub-contractor or contract manufacturers.
5. Special cases, for instance change of contract manufacturer.

8 CONCLUDING REMARKS

Discussion of culture

The definition of corporate culture can be approached from various angles. In Laurent's (1990: 89) definition the main aspects of corporate culture are summarized quite well. "An organization's culture reflects assumptions about clients, employees, mission, products, activities, and assumptions that have worked well in the past and which get translated into norms of behaviour, and expectations about what are legitimate, desirable ways of thinking and acting." On the other hand, Hampden-Turner (1991: 26-34) states that corporate culture gives an organization means to deal with dilemmas and balance opposing values so that the organization preserves and improves its capabilities.

Individuals interact in their daily social activities with other individuals who have different culture and backgrounds. To adapt to different cultural settings, individuals must have some kind of cross-cultural competence. The cross-cultural competence consists of three components, which are knowledge of the specific culture, efficient skills in the language spoken in that culture, and knowledge and skills that support adaptation in any cross-cultural setting (Abbe 2008: 1-2).

International organizations as well have tried to understand the diverse value system of their multinational structure. Organizations are trying to create a universal culture in the whole organization. The multinational organizations need to adapt to the national cultures in which they operate in order to achieve high business performance. The findings of the cultural issues study (see Appendix 1) show that the working values are strongly influenced by the national culture. Organizations that take the local cultural values into consideration can gain competitive advantage.

The definition of the concepts of operations

The concepts of operation is still a fairly new and unestablished concept. The research has shown that the concepts of operations are the main tool for executing the strategy of the company. Strategies - such as business, marketing, production and logistics and human resources - state out the goals of the company. Thus the concepts of operations can be defined as follows. The concepts of operations are a collection of decisions, which are refined into the models of operation based on certain strategies. Processes, operations and operation chains are controlled and developed by the models of operation.

The core of the concepts of operation (see Figure 8) has four key elements. 1) The concept of control which describes the rules and principles of controlling production. 2) The concept of the knowledge management defines systems for decision-making and controlling operations. 3) The human resources concepts delineate principles for personnel training and development. 4) The concepts of technology establish production and logistics technologies. The concepts of operation act as a guideline when the production system is constructed in certain circumstances.

The creation of the new production system

The production system can be defined as follows - it converts product specifications, market expectations, and raw materials into products. A combination of workflows, manufacturing and control processes, and human intelligence guides the conversion process (Jacobsen et al. 2002: 405). It is said that the production system is a combination of the physical production infrastructure and the planning and control systems for the production (Schönsleben 2009: 384).

The design process of the new production system has to be integrated with the product development process to ensure the flow of information between the processes and other interest groups. With the help of the model presented in this report (see Figure 11) a competent production system can be implemented. The design process starts with an exhaustive gathering, categorization and analysis of the information. The following phases are: requirements specification, outlines of the concept, platform construction and realization of the production system.

The productionalization concept

The productionalization concept (see Figure 14) sums up the factors for a successful production start-up. The concept has five key areas: training and supportive actions, risk management, facility management, establishment of local networks and acquisition of resources and the start-up of operations and production. The key areas are affected by four circumstantial factors, which are corporate culture and strategy, cultural environment, physical conditions and operational environment.

The concept can be seen as a progressively focused decision-making process. It consists of disquisitions, feasibility studies and concrete planning. It is a tool for recognizing potential risks and challenges. The concept gives an organization means to correct deficiencies beforehand. Application areas for the concept are establishment of a new industrial site, renewal of an existing site and renewal of a production system.

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Appendix 1.

University of Vaasa
Faculty of Technology

Kappaletavarantuotannon Ennakointi Monikulttuurisessa Olosuihteissa (KEMO Project)
Production Anticipation in Multicultural Environments

Cultural Issues Study

A report regarding a qualitative study carried out by Kerstin Siakas,
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Abstract

The main principles of the KEMO project are to recognize and strengthen in advance factors and elements of successful production in a global context and to eliminate potential risks. The main goal of the KEMO-project is to support Finnish companies that manufacture parcelled goods to successfully begin their production in foreign countries.The present study contributes to the KEMO project by examining the influence of cultural factors on global business, such as Joint Ventures, Outsourcing or subsidiaries in a foreign country.

For the past few decades there has been an important debate about convergence or divergence of work values. International organisations have tried to understand the diverse value system of their multinational structure. The objectives of multinational organisations are to create a universal culture in the whole organisation and to integrate multi-domestic operations with individuals who hold opposed work related values. There is evidence that national culture influences management practices, and multinational organisations need to adapt to the national cultures in which they operate in order to achieve high business performance. Research has shown that a fit between national and organisational culture plays an important role in organisations that promote a climate of satisfied employees.

The research question in this study is to what degree the organisational culture (the way the organisation is structured and managed) and the national culture (the ethnic values of the workforce) influences the successful start-up and production in a global context.

The research methodology applied in this study is a qualitative approach using semi-structured interviews for the identification of a number of cultural factors that have a bearing on the successful production in a global context.

The findings show that the working values are strongly influenced by the national culture. Organisations that take the local cultural values into consideration and show cultural sensitivity can gain added value and competitive advantage.

Introduction

The cultural orientation of a society reflects the complex interaction of values, attitudes and behaviours displayed by its members. In today's globalisation the management of cultural diversity is becoming a significant issue for companies. Owing to the emergence of global organisations, increasing number of joint ventures and cross-national partnerships, businesses need to embrace people from a variety of ethnic backgrounds and cultures. This has created a new awareness of the importance of understanding other cultures and has contributed to the need to develop a cultural sensitivity. Awareness of cultural differences backed up by cross-cultural training becomes an important factor for success in international business.

The integrated pattern of human behaviour in a corporation, which includes the way employees think, speak and act affects individual behaviour by imposing guidelines and expectations for the members of the organisation, links geographically dispersed organisational groups and guides them towards a common vision. By other words multinationals are kept together by common organisational cultures across borders. The objectives of global organisations are to create a universal culture in the whole organisation and to integrate multi-domestic operations with individuals who hold opposing work-related values. In global companies with a strong organisational culture, managers usually demonstrate similar management style. This implies that the impact of external culture on organisational systems will decline the stronger the organisational culture is.

Hofstede's study in the 1960s at IBM is the base for this viewpoint. Hofstede investigated how employees in different national contexts consider and react on the following four theoretical key elements, or "dimensions", of culture (Hofstede 2001) as described below:

- Power Distance (PD), which describes the extent to which hierarchies and unequal distribution of power is accepted;
- Uncertainty Avoidance (UA), which indicates the extent to which a society feels threatened by ambiguous situations and tries to avoid them by providing rules, believing in absolute truths, and refusing to tolerate deviance;
- Masculinity versus Femininity, which describes the relationship between the masculine assertiveness, competitiveness and materialism opposed to the feminine concern for quality of relationships, nurturing and social well being;
- Individualism versus Collectivism, which describes the relationship between the individual independence and the collective interdependence of a group.

The outcome of his survey shows that employees in the same national context share similar attitudes towards these four dimensions. Differences only arise between different national contexts. Research has identified many organisational characteristics that seem to be influenced by the national culture, such as management systems, leadership style and organisational performance. It is obvious that national cultures cannot easily be changed; organisational cultures on the contrary are manageable to some degree and when several organisational cultures are involved in global business the staff involved in international operations needs to be trained for effective cross-cultural communication and avoidance of cultural underestimations and misinterpretations of intent.

The levels of culture chosen in this research are the national and the organisational levels.

In this study we have not tried to determine the organisational culture nor the level of divergence of the workforce within the organisation, but instead we have considered the organisations from

the viewpoint of their national culture since there is evidence that there is evidence that national culture influences organisational culture and different national cultures have preferred ways of structuring organisations, different patterns of employee motivation, as well as different solutions to organisation problems.

Research Methodology adapted in the study

By using semi-structured interviews the respondents are allowed to say what they think and to do so with greater richness and spontaneity than when using questionnaires for example. This research suggests that in order to start production in a new country critical success factors are dependent on the awareness and consideration of the national culture and of the organisational culture of collaborating partners in which the new production is going to take place. After the in-depth study of the literature regarding cross-cultural issues a qualitative investigation was performed in order to address different aspects of the research problem, to confirm the findings from the literature review and earlier studies. The main objective of the field-study was to get a more in-depth view of the research problem and to test the hypothesis.

The idea behind using semi-structured interviews was to allow the respondents to express their feelings spontaneously. The open-ended questions were used to initiate the discussion and as a guide to follow same structure. However, in order to allow the discussion reflect opinions important for discovering new issues important for the start-up of a new production in a foreign country the researcher lead by the discussion asked questions not always programmed in advance. By catching the spontaneity of the interviewees the results were enriched by issues that in particular had made impressions on the interviewees and likely to be important for Finnish organisations that want to start a new production in such national cultures. The interviews were approximately one hour long were recorded on tape and afterwards transcribed.

The majority of the interviews took place in the interviewees' company premises during September 2011. The data was analysed by reading through the documents several times and identifying items, topics, phrases, comments and remarks that seemed to refer to common issues or matters important to the respondents regarding cultural issues. Reflective analysis was used in order to make sense of data gathered. Below follows a list of topics covered in the interviews. First the interviewees were asked to tell some background (demographic) information about his company and himself and how he was/had been involved in cross-cultural management. He was asked to complete point 4, his own organisation at the site. Then he was asked to complete the table with 27 statements according to a grading scale from 1 (not at all significant) to 5 (very significant) regarding how he considered that the statement/characteristics fitted into the country he had experiences of. He was also asked to comment on the questions if something came to his mind. The statements in this table were all derived to the literature review. Finally, dependent on the comments during the completion of the table the rest of the questions were asked.

Findings from the Qualitative Study

In total 9 interviewees took part in the study all energy and technology companies in the region of Vaasa. All respondents had managerial positions and had been/are involved in international business operations.

Due to the small sample it is difficult to make generalizations. However, the responses all have something in common and the most important issues are summarized and presented in this report.

The countries that the interviewees have most experience from and also referred to in the interviews are presented in table 1 together with the Hofstede's work-related cultural values.

Country	Power Distance PDI	Individualism Collectivism IDV	Femininity Masculinity MAS	Uncertainty Avoidance UAI	Long Time Orientation LTO
World averages	55	43	50	64	45
Finland	33	63	59	26	33
China	80	20	-	20	118
South Korea	60	18	85	39	75
Thailand	64	20	64	34	56
India	77	48	40	56	61
East Africa*	64	52	41	27	-
Russia	-	-	-	-	-
Italy	50	76	75	70	50

* The Hofstede analysis for East Africa includes the countries of Ethiopia, Kenya, Tanzania, and Zambia.

From the world-average values compared to the values for Finland we observe that Finland has a lower Power Distance value (33 compared to 55), which means that that people in Finland consider that everybody in an organization more or less have the same rights with people higher up in the hierarchy. On the contrary the Power Distance values in all countries mentioned in the interviews are much higher than in Finland, which can create considerable misunderstandings and problems if not understood or taken into consideration. Finland is also an individualist country, which means that Finnish people are relatively independent opposed to people from most of the other countries, which are relatively collectivistic, manifesting a close and committed member 'group', be that a family, extended family, or extended relationship, being in fact a support network / group. South-Korea, Thailand and Italy are more masculine countries than Finland meaning they value assertiveness and completion, whilst India and east Africa appreciate softer nurturing values and quality of life. On the Uncertainty Avoidance scale China has a lower value than Finland and East Africa which are almost the same. South Korea and Thailand have a higher value (39 and 34) but still far from the world average (65) and Italy (70). In countries with high Uncertainty avoidance people feel uncomfortable with ambiguous situations and need to have clear rules to follow in order to be in harmony with the environment. Finland has the shortest long term orientation 33 and China the longest (118). South-Korea, India and Thailand follow with 75, 61 and 56, all longer than the world-average of 45.

Organisational Culture Values

Regarding the global company characteristics recognised mainly on the sites respondents view was that the organization is in the middle between centralized and decentralized. There were opinions expressed that recently the organisation is becoming more centralized than before. It is also rather tight controlled with a relative flat hierarchy. Half of the participants considered that it is management driven and half that it is participative. Everybody seemed to agree that it is more task oriented than people oriented and quite product oriented compared to process orien- ted. ABB is considered more decentralised despite the fact that it is management driven and tight controlled. It also seems to have a deeper hierarchy. Also here the respondents consider it to be rather task than product oriented. *'The final result is important, not how it is received'.*

Respondents views on cultural divergence issues

In the following paragraphs we will reveal directly comments of the respondents regarding issues that improve our understanding of the international business or issues that have made impression on the respondents and which they consider important for cross-cultural collaboration and communication. Direct citations are written in italics within hyphens.

Global Presence of Finnish Organisations

Most of the Finnish companies with a global presence seem lately to be involved in mainly joint ventures. The reason for this is that they *'have gone to mainly challenging places and countries considered 'difficult' with a lot of protectionism and also politically challenging. We are talking about China, Russia, Asian countries and American countries. By using joint ventures you get a local partner that can support you so you get easier into the country through the already existing network of the partner. Also as local company they get easier support from the government.* ***Usually we have gone to countries offering them technology we have but they do not have.***

'Zambia was easier than Kenya*, but in both countries the working permissions could be really slow or impossible if a local consultant was not hired to take care of the issue.'*

'We understand that ***joint venture is an important form of collaboration for technology transfer to challenging countries due to the fact that the risks are shared with a partner*** *who already has a customer and supplier network in place. Another important issue is the* ***local knowledge and connections to authorities, because in most cases all kinds of permissions are imperative for new start-ups.***

How do you choose your partners?

'This is a very challenging task. It depends a lot on their level of technology use and knowledge, what kind of market we are interested in, and how willing they are to join us. Even if we find a partner we think is suitable it does not mean that the partner is willing to create a joint venture with you. All factors need to fit in otherwise an agreement is impossible to make. If one factor is not working it become directly very challenging. We have also had a few cases when it did not come to an agreement. Usually the first contact comes through our sales. If we see that there is a market potential but for some reason we do not manage to sell there we start to think about some kind of joint venture to penetrate the market.

We have a big global sales network so we get information from everywhere. Of course in some places you need to understand the local content requirements or you need to have a special amount of local production in order to give an offer. If we do not manage to sell in certain potential markets we may start to think about other solutions for penetrating the market. We may put up a joint venture that does a part of the production, not necessary the whole production.

We prefer joint ventures from outsourcing for example because we want to keep some tens of the key factors in our own hands. It the break the agreement very heavily it will be breaking the contract and the law and in jointed ventures it is easier to control this than in the case of a licence. We always have surveillance from key persons over there. In the beginning usually also a local person from the sales partner, also takes part as a key person for us. Our person may not be from Finland, he/she can be a local organisations representative whom we have collaborated with for many years. So usually we get our own surveillance in the new joint venture to minimise risk'.

Do you use of "cultural bridging staff" (people rooted in both countries) for informal sharing of experiences?

'We have bridging staff, but mostly local people with connections, who know English.'

'Yes we do. We deal with some people who are leaders for groups abroad. People rooted in both countries are the best in this position because they can understand what is important in our culture. For example for us it may be very important that an excel file is updated. We may sit and discuss its details in meetings every week and want it to be updated, whilst for other cultures it may not be so important.'

*'In **China** our quality manager has studied at University of Vaasa. A Chinese who is born in China will work for the boss not for the company/organisation and he will change to another company if they pay 1 euro salary more.*

*But in **Korea** it is totally different. **People tend to work for the whole life in the same company** if they are satisfied and in particular if it is a big company such as Samsung or Hyundai. If you work for Hyundai for example and you change work to Samsun it is considered as a huge betrayal. It is like a **military rank (personal status)** somehow in the work. You **have to be 2-3 years in a position before you can go up in the hierarchy. You cannot bypass a rank**. Even when you change company you have to negotiate for the rank. People don't speak about salary, but about the rank. You can even loose a ranking.*

If you are 10 years in a company or even 15 years the salaries are quite low compared to Finnish salaries, but on manager levels in some cases they are even higher than in Finland.

In Finland we have a three level management hierarchy system as a 'triangle', whilst they have a very heavy middle management which can be depicted as a 'salmiakki'.

What are the challenges of working in global settings?

'The challenge in working in global settings is the travelling, visas, etc. and in that case you are exposed to political problems between countries.'

***Russia:** No, You cannot trust anybody. **They put their own interests in first place**.*

*In this moment it is difficult to say but **you have to know what you talk**, with **whom you talk and who is responsible for what.** You can speak a whole day to a person who cannot influence the process at all. You have quickly to be able to choose who you sit next to. You have to see quickly understand who is the boss (usually the nominated boss is also practically the boss), who is his boss etc. By other words you need quickly to understand the hierarchy and who is responsible for what, who reports to whom etc. in order to get contact with the right people who have some influence on things. In Finland you can go through the upstairs. Here it is absolutely necessary. You can spend half a year on the bottom levels and nothing happens. You can avoid a lot of work if you go to the right person or at least close to the right person. I do not like this, there is no innovativeness. Nobody does anything if they are not threat that I will fire you if you don't do this and this. This I have never experienced in Finland.*

You have to talk to them as to children**. It is no use to go there with posh presentation. You just print '**factory' – 'timetable' and show some stamps that things have been decided.

South-Korea: ***One barrier is without doubt the lack of common language***

In my organisation you apply for the position to go abroad and they look if you are competent enough. At the partner company they tell 'you and you have to go' from within the company. They don't ask if they want to go. At least they had looked for people with English knowledge.

For example the Korean quality manager would not take directly contact to the Italian quality manager. They would come to us, tell us that we want to be informed about this issue, although it could be an issue we were not directly involved with. We were there, close to them and they gave us the paper to contact the Italian quality manager. ***They did not question the answer. It was almost like a standard.*** *This is the way we have to do it.*

You should be from the beginning in the project*.* ***It takes quite long time to understand how things work in a new culture and to get to know the people you are going to collaborate with.***

I went quite late to China. The factory was already running. It would have been much better to be involved from the very beginning.

I was doing other things here and later on they realised that we need a quality manager there. They had some local quality manager, but it did not work. ***The quality manger had to be from our organisation because the local person does not have the same understanding for the Finnish culture and the organisational culture.***

It is quite difficult to put any decisions forward. We look at the following situation. There are blue-collars, who are down on the factory floor screwing the screws etc, and a few engineers, who describe the process. In Finland we discuss the process tell the workers the sequence we want the different processes to be carried out. It is accepted and people will follow the process put up.

In South Korea, if you have a blue-collar that has been 20 years on the factory floor and knows what he is doing, and the young Engineer from Finland says for example that the process does not work and we have to put the turbo first, the younger South-Korean Engineer, whose job was to calculate in which order-sequence the different phases was optimally best to carry out. ***He will not tell the older worker to change the process****. He cannot do it.* ***Older people are respected. It has to go through some boss higher up in the hierarchy if the younger engineer wanted to change the sequence of a process*** *(although it was his job).*

What differences have you experienced in meetings?

If you are in ***Finland the agenda is decided in front, everybody is on the spot on time. Here we take the decisions, write them down and that's it****.*

In Italy a few people are on spit at the meeting starting time, more and more people drop in one after the other to the meeting and everybody talks a lot in Italian*, somebody can talk a little bit English with you and finally take the subject to something else than the original agenda.* ***In the end nothing is decided****.*

In ***Russia*** *it is totally different. Nobody speaks English on any level. We have a translator.* ***The decision making is very stiff****.* ***The bureaucratic processes*** *were a big surprise for me.*

The Russian director takes the decision, a protocol is written – translated, a list of all participants is created, a lot of stamps and fax of the document to main office. ***They do not use emails. You cannot phone them because they do not speak the language.*** *Everything has to go through the translator. Body language is used. You see from the face how they react, but you cannot say if they say agree or not.*

What competences do you consider a global manager needs to possess?

'A global manager needs to understand how the different organisations work and be able to see underneath the surface. You can't go as a Finnish manager to China and think that things work in the same way there. Some people are more open to this.'

***Good nerves. You need to have an adventurous nature and like to discover new things**. It is totally different from for example a Finn and a German deciding to build a factory together. The mentality is totally different between Finns and Koreans. There is a **lot of social issues you need to take into consideration.** In the beginning there was a lot of going out. I started to became very tired about it and said thank you but I am very tired and want to go home. Go you in between yourself. - But aren't you hungry, are you not going to eat. Who is going to cook for you?. I am going to do it myself. - That was a big surprise for them. So to prove for them that I know to cook I invited them for spaghetti one day. The men did know to do noodles. They were away from their home city and their family in another city. They just went home for the weekend. Since they did not know to cook they went out every evening to B-class restaurants with cheap food and beer and a lot of singing.*

***Travelling opens your views**, but I have been quite open also before I went to Korea.*

*The thing you clearly see is that **the individual is valued much more in Finland** and that we have it much better socially. For example if a person become ill in Korea it may happen that he is not paid. We wanted to introduce our social security system to them but they did not want to because they considered that their own one was better. They said that their company has a better system.*

*In our company team there was a Korean who has been working for us for 10 years. The expats from our company had their own social security policy and from the partner organisation their own. The Koreans wanted him to join the partner policy since he was a Korean, but he was also our employee. Despite the fact that they had convinced themselves that the policy of the partner company is better they were jealous of the Korean guy who was employed by us when different rules were applied for him. **There was a conflict.***

The partner organisation is almost like the state.

Does your organisation in Korea become more like Koreans or do the Koreans adapt to your culture?

The older people keep very much hold of the traditional Korean culture, whilst the young people seem to be keen on adapting to the western culture with more holidays etc.

There goes a story like this: those who study shipping at the Nivel institute (A big famous institute in South Korea) has on their last year to follow with the ship to different countries for ½ year. In the discussions with these youngsters they asked me if I had been to Shanghai etc. and I asked them where they had been. They told me a lot of harbour cities. So I asked them 'what is the best place in the world, the most beautiful place'. There was a young engineer who was thinking for a long while and then he said 'Disneyland'. It was his fantasyland – not a real country.

Is it different to manage a Chinese group in Finland than to manage the group in China?
Only some HR issues may be different.

***Thailand:** The boss gives the orders. If he asks the people to give some ideas, he will get nothing. If you have a cross-cultural team you have to think of the nationalities (cultures) in the*

group one and one. On the other side you have eg. people from USA who will speak up without being told. You have to control that as well in group settings. The physics is the same, chemistry is the same, the technology is the same all over the world, electronics are electronics, and you learn electronics in the same way. The multicultural part/business is the most tuff part definitely, because technology everywhere is the same. It is really how you get business to function in an innovative way that is the challenge. Email is the worst communication if you think about it; it is easy to send to many.

Is it important to use common systems?

'Systems may be same, same windows, same word, same excel, but the things that differ are people issues, namely how people understand things and react on things. What is important and what is not.'

Our organisation has ***its own process oriented quality system that with checks, reviews and inspections - It has high priority. They will need to learn and which they will need to use.*** *If it is related to products we have* ***descriptions and tolerance levels described.***

South-Korea: *'We tried to create some kind of company policy in this joint venture regarding how to travel etc., but they had so unbelievable rules from their side so* ***it was impossible to come to a common agreement.*** *For example they had a rule that if you travel within the country you got money for the day (daily allowance) just enough to sleep in some kind of motel, not even a hotel, without breakfast, nobody spoke English etc. They considered that we should use the same rules as well, but that was totally impossible, mainly because if you phone to book a room somebody was just shouting 'jokosee' in the other end and there was no communication possibility. Also* ***the Koreans did not understand that we do a lot of work from home,*** *like reading and answering to emails and phone calls etc. According to them all work had to be done in the office. The Koreans were not allowed to take the laptop with the home.*

The Koreans knew to use emails. Nowadays they also use teleconferences quite a lot, but no work is allowed to be done from home although they have fast internet (broadband) even at their homes. They offered a free evening snack if you were until 17.30 at work. In addition you got a free bus drive home.

The managers came at 6.30 because they have these 1-2 hours morning meeting and often they stayed until 18.00. They did not understand that if we one day worked later we could come later next day to work. Also all bills had to be paid through the bank, because internet banking was not working on the company computers, so we had to go and pay our bills during working time.

How to create a successful cross-cultural team?

You really don't have the ability to choose the people in your team. If you are going to put together a new team you need to specify the type of skill you need

In my experience distributed (virtual) teams with on-line meetings do not work at all.

There may be teleconferencing and discussions, but everybody seems to expect somebody else does the work. When you do live visits it works better. It does not matter if the team members are from different nationalities, but the distance matters. Those who are from a foreign culture have to adapt to the national country where the team is situated. The country culture is stronger than organisational culture. If my company ***goes to China we have to adapt to the Chinese culture, we cannot expect that the Chinese adapt to the culture of our company.*** *I see this very clearly! In particularly in China they have a very strong network in between themselves. When you come as a leader you cannot come with you ideas about how things have to be done. It depends of*

course about how strong personalities they are. It may seem that they do as you want but they do it to please you and as soon as you have gone away they do as they want. This is in particular strong in China. In India they are more flexible. Hey have other kinds of problems and have experiences other things. They have strange religions and thousands of Gods that influence on things. With time you get experience. I have had help personnel in India who are bosses of a team. Bridging staff that have for example studied in Finland understand the Finnish Culture better and know what is important in Finland.

Women in expert jobs are appreciated; But all mangers are men, women are secretaries and other lower jobs. But actually women are highly appreciated in for example toasts 'maljapuheet' you have to address them, maybe as mothers, wives etc. Finland compared to Italy, Asia and other countries are kilometres away. You can just look at the numbers of women in leader positions. In Finland they are more advance regarding this matter and certainly double of those in Italy for example.

'It is quite difficult to work with cross-cultural teams. In the beginning we employed a girl who taught the Finns Chinese for 1 hour per week and English to the Chinese. It was good. The bad thing was that we did not have enough time for that. It would be good maybe to start cross-cultural and language course quite long time before going to foreign country. It is also very important to meet people face-to-face you are supposed to collaborate with.

In the beginning of these projects it is important to have a very good Human Resource Management (HRM) when requiting people.

What characteristics did you look at when you recruited people?

Suitable education, good knowledge of English, open mind (this was assessed with the interview). An important issue was that people tried to speak English although their English was not maybe the best possible.

Patience. You have to be very patient!

Will the foreign culture influence on you so you become like them if you stay long time in a foreign culture or do you believe that the culture you have grewn up in is dominant for your personality?

Surprisingly many expats I met, who have lived very long time in China and who had taken the decision to stay there forever, still were real Finns culturally.

You cannot either change the Chinese. You just have to try to adapt the working conditions and practices to suit both cultures.

The Finns seemed to adapt quite well in the Chinese environment.

What do you think is the factors that make Finns to be relatively adaptive to new cultures?

I think it is the ***humble attitude Finnish people have in general. They are not arrogant.***

How would you describe the structure of a successful team?

'Five team members best with one permanent team leader.'

South Korea: *'One department was one production team including approximately 7 Koreans.*

In the teams during the building the Koreans were 5 full time and we were 2 from Finland.

Their style was to discuss a lot and then one of them came and presented the discussion and what they had decided *We let them do so because in the end of the day it was faster in that way. One person could not take a discussion, therefore they had so much discussion and everybody signed so nobody would be accused.*

How are the team members chosen?

Usually we cannot choose team members. It is a matter of resources, unfortunately. When one project finishes team members are sent to other projects. We don't employ new employees. We do not have any choice. People circulate.

When a new project is created, with new team members, the leader is important. That he keeps the team together and give team roles to people. People are not very enthusiastic (I have not seen anybody at least), the team leader has to make it going. It is quite hierarchical, the team leader distributes the roles. Afterwards some people can become a little bit enthusiastic.

Do you have a different motivation strategy in different cultural context?

Within my company we have certain Bonus Schemes. It does not apply in these kinds of projects. Your performance in the project will not be good or bad in terms of the bonus; it is more like a global thing. We have had it in my company for a while.

The teams are given the time for reflection in the evenings, because the team members often live in hotels and we have dinners, breakfast sightseeing and other activities together. A lot of the human side issues are solved in these informal meetings

How do you know the team is achieving goals?

In the beginning we have kick-off meetings where we discuss the objectives, team roles, obligations, milestones etc. usually the team leader says how things have to be done. There is not much commitment from the other team members. They may say their opinion, but they do not take part in decision-making. Only if there are some specialised tasks then the specialist (SAP specialist eg) says how things are and have to be done. We must believe him. If we have team members from other countries we try to invite them in the beginning to get to know each other, but there are occasions in new projects where team members from other countries do not participate.

Is there a designated person who checks progress, performance etc.?

We try to keep metrics, but it does not seem to work either. Usually we start keeping track of different things (eg progress in an excel table) but we get looser on the way and stop writing down things daily. Usually we have manual checks instead. My project does not go directly to the customer. I can understand if you have sold a programme you have to keep the time tables. With us it is more internal things.

I have taken part in some big projects where we had quite tight timetables. There we had milestones and the project leader checked the progress status.

Knowledge sharing: Live meeting, sometimes small groups if special things, sometimes informal groupings. Often we have problems within the teams. We have a saying 'we push with a rope' meaning that nothing really happens.

The team members have their own goals, eg the purchase department measure other things than us. They my measure how to get down the prices, but for us it is important to get the goods on-

time. Etc. Also you may get salary depending on the metrics. Nobody is interested in metrics that do not seem useful.

How do the team members communicate?

'We book meetings in the live-meeting which when you log in also inform the other members of the meeting. It makes it quite formal and everybody knows what is happening. For more informal meetings we may send emails.

How was knowledge sharing?

South Korea: *The information was shared in the meetings daily meetings and one should have expected that everybody knows everything. However, after a week, somebody from another department could come and ask 'when are we going to decide this thing' although the people from partner organisation had been discussing this issue for a whole week. We let them keep these daily meeting where a lot of discussions in Korean language was going on and we asked them to inform us when they have taken a decision.* ***It seemed that despite the many discussions everybody was not informed.***

Does the team take time to review its progress and performance?

We don't really reflect much. We go on with our daily duties and do what we have to do.

Does the team take time to reflect on improvement possibilities?

Very little reflecting is made.

Do you provide cross-cultural training to teams?

Not really. Typically not, except if the leader of the team thinks it is necessary. I myself always try to give training if I bring some new in but most of the time it is informal for example we have discussions like this and this you need to be careful and these are the things we expect of or we can give them a book like 'Lewis' and tell them read this because you need to have an understanding of it or if I think of my own case I had to read two full book before really understanding it.

To create a team you first look at the technical things you need. Sometime you know the people and sometimes not. Pulling them together once you get them you find they have some skills gaps technically or culturally. You have to try to fill the gaps and it could be for example northing more than to ask them to read some text on cultural issues.

We try to meet at least for a week in the beginning of a project. For example the Chinese come here for a week.

'How can you prepare for the culture? I just dumped into deep water.'

'It takes approximately 4-5 months to understand the culture.'

Do you have team-building processes in the beginning?

A little – In the kick-off discuss aims and objective and to get started. If some Chinese would be in the project I am not sure if they would be on the kick-off meeting.

How do you create a good team spirit?

It is very difficult.

'A good cohesion is important, everybody understands their parts, like in a sports team, you have to know when to pass the ball to the person.'

'Sometimes you need to swap (exchange) people in the team, sometimes there is bad chemistry with people from our organisation and then we need to swap those people. I have seen this happen twice'

'I try to ward people in the way they want to be awarded, but it can be very different. I try to involve in people's problem and be concerned about their well-being, but sometimes I can't bother. It is also difficult to be a leader and sometimes you want to keep a distance. People really understand immediately if I am really interested in what they are doing and if I am not so interested in their daily small problems and disputes. I also realise that they realise my interest and of course it is better if you have the interest and patient to talk about their everyday problems, but sometimes you just can't do it. It is important that somebody listen to you. We have some development discussions but it is not usually on that level. I have myself been on many development meetings, but I cannot really say that I felt they were useful. It depends a lot of the manager and everybody is so different.

Finns and foreigner working together, often you generalise. If there comes a Chinese you don't like then you don't like the Chinese. There are also people who do not want to work, they resist to everything negative on purpose all the time, find out ways not to do anything. We have those kinds of people here as well. These kinds of people can of course come from any nationality but of course it is much more difficult to communicate with Chinese for example.

***Finland:** everybody can speak with everybody, when I was young and had summer-jobs I looked up to the boss, but not any more. Of course they have higher salary and some privileges (at least the top managers). The middle managers can only delegate some low-status jobs to other people, but of course you have to check that the sub-ordinates do what they should do. Sometimes it is so complicated to explain what to do that you prefer to do it yourself. Of course there are also people who understand what they have to do and take responsibility.*

'You have to look at the objectives and that the interests are not conflicting. We discuss the different understandings of the project objectives and our work is to make it work. ***In Italy for example compared to Finland the own interest is very strong*** *and if you ask the Italian 'what is this number, it may not be the correct number' the Finns would give the correct number even if it may weaken the situation or the future of the factory, the Italians will try to understand what a certain number mean and how it effects them. Our difficulty is when the Italians for example provide us with a number (metrics) to estimate if it is correct. Leading culture in* ***Italy is group oriented,*** *you take care of yourselves, whilst* ***in Holland they are more egos*** *and you need to see how you can get to talk to them*

Conclusions

The interviews revealed that when Finnish organisations expand to new foreign challenging markets they prefer joint ventures to minimise risks and gain advantage of local established networks. However, every interviewee recognised that taking cultural differences into consideration is crucial for success. The interviews confirmed the findings of Hofstede. It also became evident that that it takes 4-5 months to start understanding a foreign culture. Some cross-cultural training is provided in advantage, but certainly more training would be required.

Particularly two dimensions, namely Power Distance (expressed as structure) and Uncertainty Avoidance (expressed as degree of rules and regulations) apply for organisational culture (Hofstede, 2001). Below some examples are provided for these to dimensions to further emphasise the results from the interviews.

Power Distance

'Master Servant relationship is normal in ***Zambia and Kenya****.* ***For us it feels wrong.*** *A strong leader is important but* ***in knowledge sensitive work a strong leader may bring more disadvantage than advantage.*** *For example if the manager suddenly decided to come to a meeting nobody else* ***spoke in the meeting*** except the *manager. And when we asked for a progress report '****Everything is ready'*** *was the answer. In these countries cannot speak up when a strong authority is present. With us they learnt to be more confident. Kyllä mutta. Yes but.* ***I learnt to say NO there.***

In ***Russia*** *again* ***nothing happens if I do not ask the big boss****. Then you also have to ask the boss to give order to the subordinate to do what you have asked for. These are the difficult things in Russia. In the meetings they do not speak up, everything is always OK although it may not be. In* ***Italy the bosses have a lot of power****, but in Russia they have even more. The executive director is by law legally responsible for the sub-ordinates. If somebody is shot in the factory the boss will be questioned. 'They believe* what you say. **You have the Power**. If you walk with a director they think that you will buy the whole place or **if you have the title of manager they also look up to you.**

If the sub-ordinates are not satisfied with the boss they will do nothing. In no case they will not go to the boss of the boss. In Italy maybe they would go to the boss of the boss, but not in Russia. They are on the same level as in **China or in Korea.** In **Korea if I am the boss I would sit on a chair 1 meter higher than them and nobody would go home before I go home**. **They do not even go to the toilet without permission.**

It is very strange. It is also ***important that you sit somewhere higher up physically****. They call me by Mr. and my Surname. If you are on the same level and after having had a few times drinks with them you may start calling them by their first name. You never call the sub-ordinate with his/her first name and of course sub-ordinates do not call their bosses by first name. Mr Doctor, Mr. Teacher etc.*

If I tell somebody to clean the floor somewhere in a corner, they will keep cleaning in that corner until I tell them that you can clean the whole floor. ***They do not take initiative by themselves****; they are waiting for orders and do only just what you have told them, nothing more. This is very heavy and time-consuming for the boss. The leaders will be trained here in Finland. We will show them how we understand things and how we want things to be done. So we have done when starting other new factories as well. The leaders are trained either here in Finland or in Italy and then they transfer the knowledge to the sub-ordinates on the work-floor. All workers are local. It is cheaper that way, but of* ***course it is a challenge to deal with the cultural issues****.*

Uncertainty Avoidance

'*The bureaucracy and the norms are enormous in Russia. If you for example have a building drawing where a tick without meaning is missing in the corner they tell you to go home and make new 200 drawings although maybe only 2 ticks are missing. Or if you build on a channel and there is a norm or legislation that the surface paint should be a particular one and somebody realises in the inspection that there is a small painting problem in a corner somewhere then he writes CLOSED and after a week if you have not fixed the problem or you have to pay to the inspector so he does not close the place.'*

South-Korea: *It was* ***extremely bureaucratic and a lot of permissions and signatures*** *had to be in place* ***for things that in Finland were taken for granted without permission.***

When we decided to build the factory from our side a separate construction team came and a local construction team was selected. People with knowledge in English were of course chosen in the first place. ***The Korean team took care of the permissions.***

Final comments - What to take into consideration when going to a new country?

'The difficulties have to do with the culture and ***different ways of understanding things, interpreting things****. You think you understand, but often you don't,* ***you see things differently and do not understand what is important.*** *It is not a question of language, but the understanding - of what we understand, the* ***underlying meaning.'***

'Within my organisation the organisational culture is probably different globally than if there is a subsidiary in a certain country. ***The country influences the organisational culture****.'*

'The most important thing is to ***find trustworthy people.*** *Usually we use people whom we already have collaborated with, 'tutun tuttuja', people who are introduced by others,* ***references.***

'Usually you find someone who has been there before' - ***networking is important.***

'You have to adapt to their way of doing things, it will not work the other way around. This is the way they have learnt to behave, it is their culture. You are the newcomer and you have to adapt to them.'

'You have to be very patient!'

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