BLOCKING FACTORS OF THE EKC:
"A CASE STUDY ABOUT IMPROVING THE EUROPEAN KNOWLEDGE CENTER"

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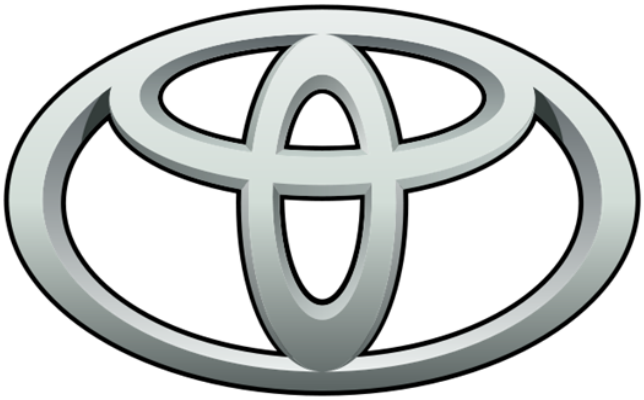
Master of Business Administration:
Innovation Management

"How can the EKC Managementen Team improve the EKC by taking away the blocking factors?"



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Management Summary

The aim of this exploratory research is to improve the European Knowledge Center (EKC) by investigating the blocking factors which users experience by using and sharing via the EKC. The objective is to measure what influences the decision to participate and what influences the decision to share knowledge. Additionally improvements for the EKC are proposed.

Goal and Problem

The EKC is a Virtual Community of Practice (VCoP) that was established in 2009 as a European counterpart of the Global Knowledge Center. A VCoP uses information technology to support knowledge sharing within and between communities of practice (Pan *et al*, 2002). The current EKC consists of 600 National Marketing and Sales Companies users and 150 Toyota Motor Europe users. The goal of the EKC is to become the leading one-stop-shop platform for exchanging business –and sales information, best practices and knowledge for Toyota Europe. Its vision is to provide an interface whereby users can share in order to enhance retailer efficiency, improve standard operations and increase sales across Europe. The EKC website has already gone live, but for the management it is not sure why users do not want to participate (actively), or do not participate at all. Furthermore, it is unknown why users are not sharing their knowledge.

Research design

As a research design, a quantitative questionnaire was prepared. This questionnaire consisted of open and closed questions based on a variety of scientific texts. The closed questions were asked using a 5-point Likert-scale. The questionnaire was first tested by 17 people from 3 different departments before being e-mailed to the whole EKC population. It was also possible to access the survey via a link on the EKC website or in its monthly newsletter. A reminder was sent out to the entire population after one week; and in total the data took two weeks to collect. The outcomes of the questionnaire were analyzed using several statistical tests. First a factor analysis was performed to identify the number of constructs. After that the constructs were tested on reliability using Cronbach's Alpha. Correlations between constructs were tested and the whole model was tested using a multiple regression analysis. Differences between the kinds of users where tested via F -and Student-T tests.

Reasons for participation on the EKC

With the multiple regression analysis, we did not find evidence that the EKC contributes to the innovation of standard working methods. As formulated in the hypotheses however, the outcomes do show significant differences between users who never access, users who access and users who share information and knowledge on the EKC. The differences recorded between each of the three levels of usage are at least accurate up to 5%. The results show that the monthly newsletter is stimulating users to access the EKC but is not motivating them to share their content. Access is preventing them from usage on the contrary. Many users are experiencing difficulties accessing the EKC (via TARs); a blocking factor partly explained by the users' level of IT knowledge. Differences between the decision to access and use the EKC are also explained by difficulties with English being the language. It is interesting to note that people who access the EKC are more committed to it and have slightly more trust in the other users of the EKC. In terms of help and support from sponsors and management of the EKC, this appears to have little influence over the decision to access the EKC. However help is better rated by people who have accessed the EKC then people have not.

Reasons for sharing

In terms of the decision to upload and thereby share information and knowledge, the way management leads the EKC makes a significant difference. This outcome is more interesting knowing that for those users who can upload there is no difference between users who do and do not share. Knowing that management has more influence on the EKC members that have accessed the EKC, these users might focus more on the fact that sharing content does not mean loss of knowledge power, since there is still a significant difference of opinion between the users. Management can for example motivate with the explanation that sharing contributes to the continued improvement of the organization. This feeling of so-called self efficacy is different for users who do not share. Sharing not only has a positive influence on the organization, but also on the employees themselves. They enjoy sharing on the EKC more, although this might be explained by the fact that users who share are more committed to the organization. This is for example seen by the fact that although the users think it is more difficult to codify the information for the EKC, they still upload.

Implications for Theory

Although this research resulted in some interesting outcomes, we did not find proof that the EKC contributes to the improvement of retailer efficiency, innovation of standard operations and increased sales across Europe. However, this research contributes to the theory by showing that there are significant differences between users' decisions to access and share. Where other researcher only focus on people contributing by sharing (Wasko &Faraj, 2000), seeking information (Kankanhalli, 2000) and focus on the beginning stage (Dubé *et al*, 2003), this research fills the gap by taking all types of user into account in a mature VCoP.

Implications for practice

These results have implications for practice. In the event that the EKC wishes to grow further, then it must keep in mind that the role of management changes as the EKC becomes even more mature. For new users accessing the EKC the role of Sponsor management is vital. For sharing on the EKC, the role of EKC management is important. Recommendations are therefore for the sponsor to remain to show the importance of the EKC. The first priority of the EKC management is to prevent early blocking factors for users as for example access methods. Additionally, management should promote the importance of sharing. This can be done by delegating more responsibility to core users and stimulating them to take leading roles in parts of the EKC. The function of the EKC management will become more of a guiding role, controlling the overall strategy of the EKC.

Further research

Further research can investigate in more detail what stages intentionally formed VCoP's experience in their ambition to grow and what managerial actions can be undertaken to prevent and counteract blocking factors. But although there is still a lot of scientific research to be performed on VCoP's, this research contributes with the fact that there are significant differences between users who decide to access and users who decide to share.

Preface

I would like to take the opportunity to thank all those who have helped and contributed towards the preparation of this report; without their assistance, this report could never have been realized.

First of all I would like to thank Toyota Motor Europe who provided me with this unique opportunity to spend 7 months working at their headquarters in Brussels. In particular I would like to thank my supervisor Christian Annergren, MSc for his help, support and contribution to realize this research. I also would like to thank Pieter Vervaet, MSc for supporting and revising with helpful critical notes.

From the University I would like to thank my first supervisor Sandor Löwik, MSc for attending various meetings with me to discuss the topic and for taking the time to read all the relevant supporting documents. In particular, I am grateful for all his supportive and constructive comments on my work. I also would like to thank Fons Wijnhoven, Dr. for being my second supervisor and advise during the finalization of the report. I would like to thank Harry van der Kaap, Dr. for his support in analyzing my statistical data and taking the time to structure all the required methods.

Of course I would also like to thank my family Hans, Mariet, Inge and Judith Reijnders for their support, without them this report would not have been carried out. Last but not least I would like to say thanks to Chrystelle Leroy, who supported me in Brussels and afterwards in pushing me to finish.

Reading Guide

Main outline

This master thesis is organized in several sections. When you are interested in the main outline of the thesis, it is advised to read the Management Summary and Results in chapter 6 (page 37). The results are based on a theoretical model which is provided at the end of chapter 4 (page 27).

Methodology and Statistical Methods

When you are interested in the strategy used to conducted this research, it is advised to read the research strategy in chapter 2, page 8. Chapter 5 describes the data collection and describes which threats to validity were taken into account. This chapter also provides the applied statistical methods.

Supportive Literature

When you are interested in the literature that is review for the theoretical model and the blocking factors, chapter 4 is advised (page 18). More background literature about existing literature of knowledge and virtual communities of practice can be found in chapter 3. This chapter serves to clarify chapter 4. The implications for theory are shown on page 10.

Management Advice

The managerial implications are at first summarized in the Management Summary. Further advices can be found in Chapter 7 in the form of a SWOT analysis. The outcomes are based on the results section in chapter 6. The fist analysis of the EKC is given in appendix AC, in which the EKC is reviewed based on success factors from Davenport *et al.* (1998).

Table of Content

List of Abbreviations

Admin	Administrator
CE	Customer Experience
Chi^{2-}test	Pearson Chi-Square Test
CoP	Community of Practice
CR	Customer Relations
CS	Customer Satisfaction
EKC	European Knowledge Center
EKR	Electronic knowledge repositories
EU	Europe
EMCs	Manufacturing Centers
EVA	Equal Variances Assumed
EVNA	Equal Variances Not Assumed
F-test	Fisher's Exact test
GKC	Global Knowledge Center
ICT	Information and communication technology
JIT	Just In Time
KI	Knowledge Information
NMSC's	National Marketing & Sales Companies
OEM's	Original Equipment Manufacturers
PPMD	Product Planning Marketing Division
PLCs	Parts Logistics Centers
TARs	Trust Anchored Repositories
TME	Toyota Motor Europe
TMC	Toyota Motor Company (Japan)
TMS	Toyota Motor Sales Inc. U.S.A
TPS	Toyota Production System
T-test	Student's-T test
VCoP	Virtual Community of Practice
VLCs	Vehicle Logistics Centers
Yokoten	Sharing of Knowledge

1. Introduction

Companies worldwide of different sizes and sectors are operating in increasingly dynamic, complex and unpredictable environments (Laforet, 2008). Intense global competition, rapid technology changes and product variety proliferation are part of the characteristics of the new manufacturing environment (Pun *et al.*, 2004). Especially Multi-National Corporation's have to deal with these forms of worldwide competition, thereby competing at the local and international markets. In order to keep up and stay ahead of competition, several possibilities and resources are available to gain competitive advantage over the competition. One way of gaining this advantage is through knowledge. "Knowledge has been identified as one of the most important resources that contributes to the competitive advantage of an organization, and of all possible resources that a firm might possess. Its knowledge base has perhaps the greatest ability to serve as a source of sustainable differentiation and hence competitive advantage'' (Diederickx and Cool, 1989).

Gupta *et al.*(2000) even states that the primary reason why multi-national corporations exist is because they are able to transfer and exploit knowledge effectively and efficiently in the intra corporate context over the external market mechanism. Toyota, like other multi-nationals is also working on its knowledge transfers. Toyota is widely recognized as a leader of continuous learning and improvements via exchange of knowledge (Dyer *et al*, 2000), known as 'Yokoten' in Toyota terms.

Toyota motivates the network and employees to participate and openly share valuable knowledge (Dyer *et al*, 2000). For the worldwide sharing of knowledge, information and best practices Toyota came up with the Global Knowledge Center (GKC). In Europe, the most complex automotive market in the world according to Tadashi Arashima (Toyota Vision 2020), Toyota Motor Europe (TME) decided to come up with their own more specific knowledge sharing platform (Appendix AA). The reason was that in Europe alone there are more than fifty countries from which each has its own unique culture and all face the strongest competition with the fastest changes (Tadashi Arashima, 2010). This platform is known as the European Knowledge Center (EKC) and is responsible for sharing best practices, knowledge and information between the National Marketing & Sales Companies (NMSC's) in Europe and Toyota's head office in Brussels.

This chapter will first provide background information about the Global Knowledge Center and the European Knowledge Center. After the explanation of the European Knowledge center, the research problem will be formulated combined with the research objectives and the research questions. This chapter concludes with a description of the outline of the thesis.

Background Information

The Toyota Motor Corporation (トヨタ自動車株式会社) was founded in 1936 when the company changed its name from "Toyoda" to "Toyota". According to Toyota Motor Europe (2010) the actual beginning is derivable from the year 1897 when Sakichi Toyoda completed his first automatic loom. The history of the company can be divided into several stages: The Toyoda period, the beginning years, the post-war history and Toyota as an international company. These stages can be found in Appendix A.

While reaching over 1,000,000 annual domestic sales units in 1970, Toyota opened its Toyota Motor Corporation in Brussels. With the introduction of Lexus, coming over from the United States, Toyota Belgium slowly grew into the Head Office for Europe, with a training center and an office for creation (EPOC). Currently there are ten manufacturing plants located in Europe and they provide work for more than 80,000 employees directly and through retail channels. Furthermore, a European design Center (located in Biot, the former EPOC), fourteen parts logistics centers and nine vehicle logistic centers are also located across Europe (Appendix B).

Next to the production and development plants, TME is represented in Europe via dealers and National Marketing & Sales Companies (NMSC's). Currently 31 NMSC's are in operation in Europe, covering 48 European countries and a sales network of over 3300 outlets. The NMSC's are the link between the local dealers and the headquarters in Brussels.

It is with these NMSC's that the Sales department decided to implement a European web platform for best practice sharing, and knowledge –and information exchange: the EKC. Before a closer look can be given on the EKC, some information about the Global Knowledge Center (GKC) is required.

The Global Knowledge Center

A way of sharing knowledge is through a knowledge sharing platform. The advantage of these knowledge sharing platforms is that they provide cost-effective functionalities through systematic acquisition, storage and dissemination of organizational knowledge (Purvis *et al.*, 2001). The current leading information sharing platform from Toyota can be dated back to the year 2002 when Toyota Motor Sales Inc. U.S.A. started with an initiative in the same direction, called the Global Knowledge Center.

Throughout the world, Toyota has concluded contracts with approximately 7,500 dealers (Toyota.co.jp). These dealers represent distributors and companies which perform sales as well as production. In order to ensure that the Toyota values are shared in the same way by all the distributors and dealers, a variety of activities is engaged like the production of sales tools. These tools play an important role in the supporting of sales. In order to align all the activities that help improving sales throughout the network, Toyota Motor Sales, Inc. U.S.A (TMS) opened a Global Knowledge Center (GKC) for sharing and promoting the Toyota Values.

The thought behind the GKC is: supporting the exchange- and training of continuous improvements in marketing- and sales methods throughout the world, thereby keeping in mind the cultural diversity and traditions for each region and country. Generally speaking, the activities of the GKS can be divided into four phases:

- Explanation of the Toyota Way philosophy
- Sharing knowledge and experience
- Consulting and training
- Collecting and distributing best Practices around the world.

The intended goal of the GKC is to share the information, knowledge and best practices from all around the world with the support of the GKC website. GKC users from the European market were experiencing that they needed more specific knowledge about their own markets. That is when the idea of an own knowledge center arose.

The European Knowledge Center

Toyota Motor Europe applied different sales methods in Europe compared to dealers in the United States. In Addition, the National Marketing and Sales Centers (NMSC's) were also experiencing a different approach to the GKC's. Bringing together these facts resulted in the idea of starting a European Knowledge Center around the year 2005. The European NMSC's are experiencing similar challenges. Sharing the same problems as a group has the advantage that a common understood shared knowledge programs and personal knowledge can be transmitted effectively within this closed group (Katz and Kahn, 1996).

The European Knowledge Center is held responsible for the sharing of best practices and information throughout Europe for the sales division. The EKC is guided from Brussels and all countries from the European Union and markets, including Russia, will fall under its responsibility. Currently about 600 users are joining the European Knowledge Center. A user is considered to be "someone who uses a product, machine or service"(Cambridge Dictionary), in this case the EKC. These users are divided over National Marketing and Sales Companies (NMSC's) and users from Toyota Motor Europe (TME). The way distribution of the NMSC's population is given in figure 1 below. It should be mentioned is that it is not certain whether the users actually use the EKC. It is clear however that they are subscribed to the EKC community and are able to access.

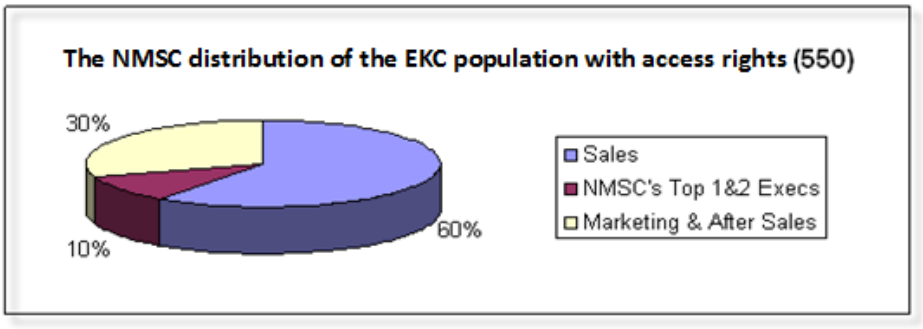


Figure 1: The NMSC users, defined as 'users', but unknown if they actually used the EKC.

Goal:

The goal of the EKC management is to become the primary source of best practices and information for NMSC's throughout Europe. With the help of the EKC, TME is aiming to improve retailer efficiency, improve standard operations and thereby increase sales across Europe. Currently the EKC is still in the process of expansion whereby other departments will be added to the EKC later on. This means that after the Sales Division, the After Sales division and the Marketing Division (PPMD) will later on have the opportunity to share their best practices and knowledge on the EKC.

However, currently the EKC is still in its developing phase. All EKC users need to actively utilize the platform in order to reach the goal. At this moment however, most EKC users are not utilizing the EKC's full potential.

Research Problem

This means that not everybody is accessing the EKC and even more users are not sharing on the EKC. The EKC management does *not really known what users expect from the EKC, why they do not actively participate on the EKC and what blocks them from sharing their best practices.* The EKC management is aiming for the EKC to become the leading platform for best practices, information and knowledge sharing for the Sales department in Europe. Or in their own words: "The EKC must become the one-stop-shop for exchanging best practices and business information for NMSC's and TME employees". The thought behind the platform is that a proven successful improvement or success at one location will be shared, so that the whole company can benefit from it. Or when questions about processes or other information is demanded by employees, the employees first turn to the EKC to find their answers or share their problems.

Currently the EKC platform has gone live and the platform is divided into several sub-sites (appendix AA). Pan *et al* (1999) found out that in order to create a successful VCoP: 'it involves more than technology but rather a culture in which new roles and constructs are created. It changes the communication patterns between individuals and teams.' Despite the fact that the technology has gone life and new roles and structures are drafted, the community can share more knowledge and participate more on the EKC. The problem of the EKC management is that it is not clear why users do not access the EKC although they have access rights, why most users do not participate actively, and why most users do not share best practices. In other words, it is not known what blocks the potential EKC users from actively using, and sharing via the EKC. And if in the process attrition takes place, it is unknown where the users exit. It would therefore be useful for the management to know where people exit in the tunnel of achieving active participation, why people exit and what motivates the community to actively join the EKC. In other words: TME would like to know what blocking factors exist for users of the EKC, which prevents the EKC from becoming the leading one-stop-shop for sharing information, knowledge and best practices.

Research Objective

Besides the question what blocking factors are experienced, the EKC management would also like to know where to improve the EKC. This is important to know because the role of management is especially in the beginning stages of a VCoP of decisive proportions (Dubé *et al*, 2003).The objective of this research is to analyze how the European Knowledge Center can be guided and improved in order to be the leading platform for NMSC's and TME's knowledge, best practice and information exchange.

How can the Toyota Sales Division improve the European Knowledge Center, to ensure a widely used platform of best practices exchange for internal –and external stakeholders?

In order to clarify the research question several sub questions are formulated so that the very essence of the questions can be expressed and the main question can be answered (Clough and Nutbrown, 2002).

1) What kind of criteria and definitions exist of knowledge sharing via an online sharing platform?
   1.1) What is the definition of knowledge in relevant scientific literature?
   1.2) What is a knowledge sharing platform?
   1.3) What is a (virtual) community of practice?
   1.4) What is knowledge sharing?

2) What influences the sharing of knowledge on a knowledge sharing platform?
   2.1) How does successful knowledge exchange take place?
   2.2 What difficulties exist with the sharing of knowledge?
   2.3) What are the success and failure factors for a VCoP?
   2.4) What is the role of management by knowledge sharing platforms?
   2.5) What other factors influence knowledge sharing on a knowledge sharing platform?

3) What actions should the EKC management take, according to the users, to make it a widely used platform?
   3.1) What are the reasons for NMSC and TME-employees to participate and share on the EKC?
   3.2) How are the users experiencing the EKC?
   3.3) What are the blocking factors preventing employees using the EKC?
   3.4) What are users currently missing on the EKC?

4) What should the EKC team do to ensure and improve on the EKC after comparing the theoretical framework with the users responses to make it a widely used platform?
   4.1) What are the strong points of the EKC according to literature and responses?
   4.2) What are the weak points of the EKC according to literature and responses?
   4.3) What are the opportunities for the EKC where improvement can be made according to literature and responses ?
   4.4) What are the threats for the EKC which can threaten the EKC according to literature and responses?

Thesis Outline

The reciprocation of the main research questions requires a certain methodology. This methodology will be presented in chapter 2. Chapter 3 reviews the existing literature, required to answer the research questions. The literature serves as an input for a model that serves to test the outcomes of the research. Chapter 4 will provide the findings of the data collection, whereby Chapter 5 will discuss the outcome of the data collection and compare it with the model. Chapter 6 ends with the conclusion and recommendations based on the literature review and the data collection. In the last chapter 7 the limitations of the research are explained.

2. Research Strategy

In order to make the research a success by answering the research question in a reliable and valid way, it is important to choose the right research method. The research method is actually the tool to solve the problem. Several methods are available, depending on the type of research that will be conducted. This research will be a case study, meaning that it focuses on understanding the dynamics presented in a single setting (Eisenhardt, 1989), with single or multiple cases (Yin, 1984). The reason to choose this type of study is because case studies represent methodologies that are ideally suited

to create managerial relevant knowledge (Gibbert, Ruigrok and Wicki, 2008). The EKC management is thus provided with useful results and advices to work with. Another advantage is that case studies seek to study phenomena in their contexts, rather than independent of context (e.g., Pettigrew, 1973). Three different types of case studies are possible (Yin, 1981). Yin distinguishes explanatory, exploratory and descriptive case studies. We use a case study with an explanatory character because we try to provide an explanation of a relationship between of 2 or more phenomena. We try to identify a causal relationship between the variables via drafted hypotheses.

Triangulation

Due to the fact that this is a very specific case, it is hard to find data of cases in the same stage or situation. Patton (2001) therefore advocates the use of triangulation by stating that "triangulation strengthens a study by combining methods''. Especially for a single case study, it is preferable to have a strong justification (Yin, 2003), so different techniques will be used. Because the research needs to be valid and reliable, this research applies triangulation. An advantage of triangulation is that it prevents the researcher from saying something else than what the data is telling, by gaining the information by different data collection methods. And that is what triangulation ensures: with the help of multiple methods, it ensures that the data is valid with the help of multiple sources. The different methods to gain the required information and data will be described, according to the order in which they were carried out during the research process. First, the basis for the research will be by searching for scientific articles and books. The advantage of using scientific articles and books is that theories and constructs are used which already have been proven to be successful and right. Another advantage is that several different theoretical perspectives can be evaluated and added to this research.

Second, experts will be used who will judge gathered information and can give suggestions to research areas that might be useful for the research. This research will use the guidance of specialists, working on the EKC and representatives from the University of Twente who give constructive criticism.

Data collection

Yin (1981) notes that the case study does not imply a particular data collection method. The data for this study will be obtained from several sources: Scientific articles, company documents, a quantitative questionnaire and WebTrends (Appendix AB) to refute outcomes of the questionnaire and complement missing data. A questionnaire is designed to answer the questions about the factors and difficulties that users experience while using the EKC. The main goal of the questionnaire is to answer what can the EKC do to ensure and improve the EKC, according to the users, in order to make it a widely used platform? The quantitative evidence can indicate relationships which may not be salient to the researcher (Eisenhardt, 1989). The reason why we choose a questionnaire as a research method is because (Based on University of Cambridge; Collaboration in *e*Learning, 2011):

- We know what to ask about
- We need to ask a lot of people
- We can ask standard questions that everyone will understand

The questionnaires is prepared, based on already existing constructs from scientific literature and from meetings with EKC power administrators and it will give an answer to all the independent variables in the model. The advantage of using existing constructs is that they have already been

tested as valid and reliable (Shadish, Cook and Campbell, 1979). The advantage of discussing the questions with experts from the EKC is that it increases the insight and understanding about the phenomenon (Strauss and Corbin, 1990).

In addition the questionnaire, data from WebTrends are also used to underpin the data. WebTrends is a web-analytics program to better understand the effectiveness of online channels in an objective, scientific way through measurement & analysis. The data that are generated with WebTrends are pure quantitative data. WebTrends is a useful program whereby results can be understood and well interpreted, and assist in identifying areas of improvements. This can be done in 3 steps (According to Michael Notté, Senior Application analyst at Toyota Motor Europe) :

- **Acquisition:** Ability of the site to drive visitors (brand awareness, campaign performances, search engine optimization & marketing)
- **Retention:** Ability of the site to keep visitors on the site (content effectiveness, product exposure, key content performances)
- **Conversion:** Ability of the site to convince people to perform key actions (form efficiency analysis, workflow analysis)

An overview of the Research Questions, related to the Methods used and how the Data is collected is given in the Figure 2 below:

Question		Method	Data Collection
1)	1.1)	Literature Review	Scientific Articles, Books, Company Documents
	1.2)	Literature Review	Scientific Articles, Books, Company Documents
	1.3)	Literature Review	Scientific Articles, Books, Company Documents
	1.4)	Literature Review	Scientific Articles, Books, Company Documents
2)	2.1)	Literature Review	Scientific Articles, Books, Company Documents
	2.2	Literature Review	Scientific Articles, Books, Company Documents
	2.3)	Literature Review	Scientific Articles, Books, Company Documents
	2.4)	Literature Review	Scientific Articles, Books, Company Documents
	2.5)	Literature Review	Scientific Articles, Books, Company Documents
3)	3.1)	Quantitative Questionnaire	Questionnaire, SPSS
	3.2)	Quantitative Questionnaire	Questionnaire, SPSS
	3.3)	Quantitative Questionnaire	Questionnaire, SPSS
	3.4)	Quantitative Questionnaire	Questionnaire, SPSS
4)	4.1)	WebTrends & Questionnaire	WebTrends, SPSS, Expert
	4.2)	Literature & Questionnaire	WebTrends, SPSS, Expert
	4.3)	WebTrends & Questionnaire	WebTrends, SPSS, Expert
	4.4)	Literature, Experts, Questionnaire	WebTrends, SPSS, Expert

Figure 2: Questions, Methods and Data Collection

Implications for theory

Although the theory of virtual communities of practice (Fang & Chiu,2010), electronic knowledge repositories (Kankanhalli, 2005), electronic communities of practice (Wasko & Faraj, 2000) and virtual knowledge sharing communities of practice (Ardichvili, 2003) is still limited (Probst *et al.*, 2008), it has been viewed already from several perspectives. Virtual communities have been researched from points of perspectives as the social exchange theory (Kankanhalli,2005 ; Wasko & Faraj, 2000) and the social capital theory and social cognitive theories (Chui *et al*, 2006). Most studies focus on how to motivate members to share and reason why members are sharing or the study focuses on how to retain members (for example Fang and Chui, 2010). The researchers focus on what motivates or encourages members to voluntarily add content to communities for users who are already active.

This study focuses more on reasons why potential active members do not share and what prevents them from joining in the first place. This gap is also indicated by Lee *et al.* (2006) who state that reasons for not sharing are diverse and complex and that there is less known about withdrawing then submitting. It deserves more attention according to them. This study therefore fills that gap by finding a significant difference between employees and their decisions to access and upload.

3. Literature Review

This chapter looks deeper into the scientific literature that underpins the research question. It is divided into three sections: The first section identifies the definition of knowledge and its aspect, answering question research questions 1.1, 1.2, 1.3 and 1.4. The second section deals with all the blocking factors from Virtual communities of practice, answering question research questions 2.1, 2.2, 2.3, 2.4 and 2.5. This section starts at chapter 4 and is also drawing hypotheses. The final section describes a theoretical framework, based on literature. The questionnaire and research questions 3 and 4 are related to this model.

3.1. Data, Information and Knowledge

When we are talking about knowledge sharing, the first question arises directly of what knowledge actually is. Already for centuries there are people who are trying to define what knowledge is. From the old Greeks, through the renaissance and the modern literature, a lot of (important and influencing) people have adopted their vision on knowledge. Although there is no consensus what the true definition is, there are however influencing people and agencies which have given their opinion. Plato's well known definition is that knowledge is 'justified true belief'. This definition is also implemented in the Online Oxford English Dictionary (2010) which defines knowledge as:

(i) Fact, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject.

(ii) True, justified belief; certain understanding, as opposed to opinion awareness or familiarity gained by experience of a fact or situation.

When talking about knowledge, there are often made distinctions between different kinds of knowledge and classifications, all depending on the area in which the knowledge is applied. Knowledge is frequently defined in relation to information and data (Wijnhoven, 2008). According to Wijnhoven there is no unanimity on either of them but this distinction seems to be 'a very popular way of thinking about what it is what we want to identify and acquire in Knowledge Information (KI) contexts'. We first define the differences below:

- **Data** is commonly known as raw facts like procedures and tasks, or names and addresses. The data only describes what is happening or supposed to happen and it serves none implicit meaning. There are though, at least four types of data: primary data, metadata, operational data and derivative (Floridi, 2005). Examples of data are facts, axiomatic propositions and symbols (Dyer *et al.,* 2000).

This changes when data is manipulated into information.

- **Information** is 'a flow of messages or meanings which might add to, restructure or change knowledge'(Machlup ,1983). Although there are different views on information we say that the difference between data and information is that information is the manipulated and interpreted data. The purpose of the information is to influence the perception and behavior of the receiver, which depends on the prior knowledge of the receiver. Examples of data are facts, axiomatic propositions and symbols (Dyer *et al.,* 2000).

- '**Knowledge** is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It

originates and is applied in the minds of knower's. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, reprocesses, practices, and norms' (Davenport & Prusak, 2000). The difference between information and knowledge is that 'information is a flow of messages while knowledge is created and organized by the very flow of information, anchored on the commitment and beliefs of its holders' (Nonaka, 1994). Davenport & Prusak, (2000) say that 'knowledge derives from information as information derives from data'. If the information is transferred into knowledge, 4 C's are covered:

- Comparison (How does information about this situation compare to other situations we have known?)
- Consequences (What implications does the information have for decisions and actions?)
- Connections (How does this bit of knowledge relate to others?)
- Conversation (What do other people think about this information)

Knowledge can also be seen from different perspectives. This paper follows the traditional epistemological view (appendix D) and considers knowledge as true belief. The different perspectives are not in the scope of this research and follow the approach from Wijnhoven and Bernard (2008) by stating that for knowledge work, 'the distinction between data and information is not as interesting as the distinction between types of knowledge is'. In the theory several definitions exist of knowledge types. However writers mostly agree that knowledge can be divided into two types (Nonaka *et al.*1995): information and know-how (Kogut and Zander, 1992), also known as tacit and explicit knowledge (Polanyi, 1983, Szulanski 1996) or Declarative –and procedural knowledge (Nonaka *et al.*, 1994, Anderson 1983). The founding father is the scientist and philosopher Michael Polanyi, who wrote in 1983 the book 'the tacit dimension' and thereby made the distinction between tacit and explicit knowledge. This distinction starts with Polanyi's famous sentence: 'We can know more than we can tell (1966, p4.). A further explanation about the differences between tacit and explicit is given in Appendix E, 'the bicycle example'.

3.1.1. Explicit

Explicit knowledge is defined as 'knowing what' (Polanyi, 1966). Polanyi describes that: 'knowledge is transmittable in formal, systematic language'. Kogut and Zander (1992) define explicit knowledge as: 'Easily codifiable knowledge that can be transmitted 'without loss of integrity once the syntactical rules required for deciphering it are known. It includes fact, axiomatic propositions and symbols'. Toyota also applies explicit knowledge management practices by documenting the task that each team of workers and individuals is asked to perform on its assembly lines. Every action is described in detail how to perform the task, in order of time, the sequence of steps to follow and the steps to control the work (Spear and Bowen, 1999).

3.1.2. Tacit

Tacit knowledge is defined as 'knowing how' (Polanyi, 1966). Tacit knowledge has a personal quality, which makes it hard to formalize and communicate. Tacit knowledge is deeply rooted in action, commitment and involvement in a specific context. In Polanyi's words, 'it indwells in a comprehensive cognizance of the human mind and body'. An important characteristic of tacit knowledge is that it is: ''sticky', complex and difficult to codify, which result in advantages that are sustainable.' (Szulanski, 1996). It is therefore important that there is a form of shared experience. Otherwise it is extremely difficult to transfer tacit knowledge (Nonaka, 1994). Nonaka (1994) states that it is possible to convert tacit knowledge and Explicit Knowledge, meaning that tacit knowledge can be turned into explicit and vice versa. Cook and Brown (2001) on the other hand state that tacit knowledge cannot be turned into explicit, nor can explicit knowledge be turned into tacit. Like Cook

and Brown we state that tacit and explicit knowledge should be seen separately but they can strengthen and enrich one another. The different opinions and models used by Nonaka and Cook&Brown can be found in appendix E, once again clarified with the 'bicycle example'.

3.1.3. Best practice

The knowledge transferred via the EKC, is transferred in the form of best practices. By sharing the best practices, Toyota is sharing "The Toyota Way" of working. Fujio Cho, (president of TMC in 2001) states that the transfer of the best practices is necessary for Toyota to 'share the way among the Global Toyota organization in order to strive for further growth while confronted with intensifying competition and growing globalization". Fujio Cho writes that the Toyota Way is tacit knowledge. According to the Cambridge Dictionary, a best practice is "a working method, or set of working methods, which is officially accepted as being the best to use in a particular business or industry, usually described formally and in detail". Nelson and Winter (1982) define a practice as: 'a organization's routine use of knowledge combined with a tacit component, embedded partly in individual skills and partly in collaborative social arrangements.' Szulanski (1996) defines a best practice as: 'internal practice that is performed in a superior way in some part of the organization and is deemed to be superior to internal alternative practices and known alternatives outside the company'. Sanchez (2000) found an example of tacit knowledge transfers when Toyota opened a new assembly factory in Valenciennes, France, which is given in appendix F. The question is not whether a best practice is tacit or explicit knowledge, but more if all knowledge can be transferred via best practices. "The knowledge management literature has currently emphasized the semiotic distinction between tacit and explicit knowledge, which implies a focus on the problem of how tacit knowledge can be codified (if at all) and how codified knowledge can be internalized as part of personal believes. The semiotic dimension distinguishes besides of tacit and explicit knowledge also latent knowledge. These distinctions are useful because these three types of knowledge require very different processes, involve different problems, and demand different solutions"(Wijnhoven, 2008). While Polanyi, Nonaka, and Takeuchi have made the distinction between knowledge that *can* and knowledge that *cannot* be expressed, their distinction is often confused with the distinction between knowledge that *is* and knowledge that *is not* expressed (for example in documents) according to Wijnhoven (2008). In his book, Wijnhoven distinguishes three levels of explicitness of understanding or prehension in order to reflect this difference. "The first type is *tacit* knowledge, which is not and cannot be expressed. The second type is *explicit* knowledge, which is expressed, or could be expressed without attenuation. The third type is *latent* knowledge, which could be expressed, but is not because of inherent difficulties to express it without attenuation. The difficulties to express this knowledge without attenuation usually stem from the fact that this knowledge resides in the sub consciousness. Often, the distinction between tacit and explicit knowledge is equaled with the distinction between written up and not documented knowledge, or between representation and no representation. This is basically incorrect, because often documentation/ representation of explicit knowledge is forgone, due to a lack of motivation or cost effectiveness. People may not convey what they know to others because that would result in a personal value reduction or the costs of knowledge documentation will not outweigh its value". For this research we use the description of best practices as a combination of several researchers: *A codified document of a persons' knowledge about a routine, working method or asset of working methods, which is officially accepted as being the best to use in a particular business or industry, embedded partly in individual skills which could be expressed to the public good of business*.

3.2. Knowledge sharing

Since the EKC is a medium which provides a possibility to share knowledge via best practices, we will look first at the process how knowledge sharing takes place. Davenport and Prusak (2000), Kohengkul *et al.* (2009) define knowledge sharing as "the process of transferring and sharing information, skills which could be measured by the volume of knowledge sharing (frequency and time spent) and the form of knowledge sharing (form and potential of knowledge sharing)". 'Sharing Knowledge involves guiding someone through our thinking in or using our insights to help them see their own situation better' (McDermott, 1999). In addition, to this, this research will use the following definition of knowledge sharing, like Kohengkul *et al.*(2009), based on (Argote & Ingram, 2000; Gouza, 2006; Yakhlef, 2007; Cumming, 2003): "Knowledge sharing is the process of transmitting information, skills, and experiences in/or best practice from source to recipient who have potential to learn, absorb, and integrate this new information with existing old knowledge and manage to construct new knowledge to enhance the efficiency of the organizations and own performance" . Knowledge transfer can exist within several magnitudes (Gupta Govindarajan, 2000): "The transfer can take place between entire networks (systematic), between joint unit pairs (dyadic) and between individual units (nodal)". Since the entire network is not in the scope of this research, we focus on the dyadic and nodal units in the organization. Knowledge transfer in organizations is the process through which one unit (e.g.., group, department, or division) is affected by the experience of another (Kogut and Zander 1992). In the literature, the communication theory is recognized as the basic element which displays the communication between two or more persons. The theory can be implemented on the transferring process of knowledge and divided into several elements, which are

According to Gupta *et al.* (2000):

- message
- sender
- coding scheme
- channel
- transmission through the network
- decoding scheme
- receiver
- Assignment of meaning to the decoded error.

Very important to mention is the distinction between sharing and transfer. The VCoP (Chapter 3.3) provides and supports the knowledge transfer and the users are sharing. The VCoP is the channel. When translating the elements into an picture, it would look like figure 3: Knowledge transfers. The figure displays internal knowledge transfers. 'Internal knowledge transfers are less hindered by confidentiality and legal obstacles compared to external transfers. Therefore they could be performed faster and initially less complicated' (Szulanski, 1996). When talking about external knowledge transfers, the coding process might be different because of lack of shared experience.

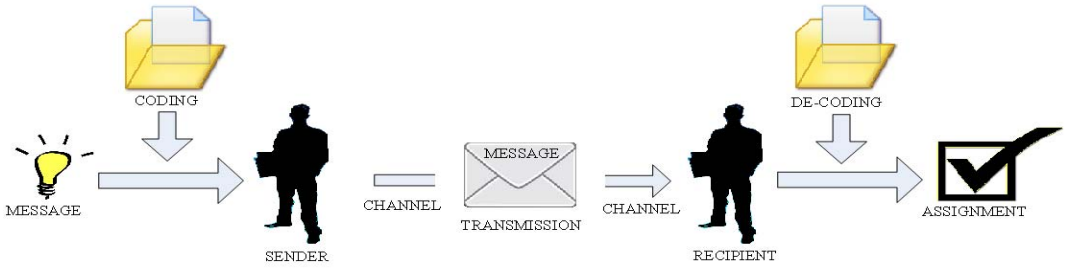


Figure 3: Knowledge transfer

The transfer process consists of different decision points, so-called phases. This can be for example when the source decides to proceed (Szulanski, 1996). These phases of knowledge transfer are given

in appendix I. In the field of strategy, it is widely agreed that knowledge assets like organizational practices and routines are ways to gain competitive advantage. The so-called received theory even states that the reason why NMC's exist is due to the fact that they are more effective and efficient in transferring and exploiting knowledge internally in the organization than competitors are on the external markets. The knowledge transfers takes place between individuals, from individual to groups and vice versa.

3.2.1. Individual and group knowledge

"Knowledge is held by individuals, but is also expressed in regularities by which members cooperate in a social community"(Kogut & Zander, 1992). However, if knowledge is only held at individual level this means that a company can easily change knowledge by replacing its employees. This statement is false because organizations know more than just the sum of the individuals. Although knowledge transfer in organizations involves transfer at the individual level, the problem of knowledge transfer in organizations transcends the individual level to include transfer at higher levels of analysis, such as the group, product line, department, or division. Within group sharing of knowledge it is therefore important to simply know the information of who knows what (Kogut and Zander,1992). Thereby knowledge integration is the way to create group knowledge. All the knowledge together forms the common knowledge of the organization. When transferring knowledge it is important to know what part is missing by the receiver (the part that is not common between them). Grant (1996) states that different types of common knowledge fulfill different roles in the knowledge conveying of the group:

- Language
- Other forms of symbolic communication
- Commonality of specialized knowledge
- Shared meaning
- Recognition of individual knowledge domains

These factors are influencing the sharing of group knowledge. The language functions as the way to verbally and written transfer the knowledge. The symbolic communication demands familiarity with the same symbols and computer software. The commonality deals with the level of equality of the knowledge by the group members. To recognize chances to use knowledge from others it is important to recognize individual knowledge of other team members. Kogut and Zander (1992) made a clear overview of how the different kinds of knowledge are applied for knowledge groups, the individual person and the organization as a whole. The relationship between individual and group knowledge is especially important for VCoP's like the EKC since users share their knowledge as an individual to the group. On the other hand are they taking group knowledge from the EKC and turn in again into individual knowledge when downloading a best practice. This is shown in figure 4.

	Individual	Group	Organization
Explicit	- Facts	- Who knows what	-Profits -Accounting data -Formal & informal structure
Tacit	- Skill of how to communicate - Problem solving	Recipes of organizing such as Taylorist methods or craft production	Higher-order organizing principles of how to coordinate groups and transfer knowledge

Figure 4: Individual and group knowledge

3.3. (Virtual) Community of Practice

Organizations have the wealth that they are able to collect codified information resources throughout the years in databases and platforms. “This represents the informational platform, which the employees process to produce more knowledge, and hence is part of the organizational knowledge base. The value of information databases lies in their potential to facilitate the generation of new knowledge by employees” (Räisänen, 2010). The knowledge can be shared via information technology in for example best practices. This sharing is from individuals who share their private knowledge or contribute to the public good and eventually engage in community interaction (Wasko and Faraj, 2005). According to Pan *et al.*(2000), this type of sharing is an extension of a principle that was in use, and still is in use, way before information technology existed: Communities of Practice (CoP’s).

3.3.1. CoP

A Community of practice is ‘a group of people who share a concern, a set of problems, or a passion about a topic and who deepen their knowledge and expertise in this area by interacting on an ongoing basis’ (Wenger *et al.,* 2002) The users of CoP’s share their interests and problems of specific topics, and gain greater degrees of knowledge and expertise of topics through their regular interaction’ (Dubé, 2003). A community of practice (CoP’s) can exist entirely within a business unit or stretch across divisional boundaries. These communities are not bounded by the hierarchical and formal structure but the complement existing structures. The CoP’s define themselves (Lesser & Everest, 2001) and can have their own goals (Wenger *et al*, 2000). The way CoP’s exist and meet can differ in different forms and sizes. Different viewing points of members force CoP’s to approach problems from different angles. A CoP does much more than working on specific problems. It is also an ideal forum for sharing and spreading best practices (Wenger, 2000). Thereby is it not necessary for all the members to know everything, because the shared knowledge pool functions in a way that the questions are answered by the member with the required knowledge. ‘But it is only becoming a successful community when members exchange specific knowledge, practices and/or experiences that contribute to developing a practice (know-how) in a specific field’ (McDermott, 2004).

3.3.2. VCoP

The community of practice is the foundation of a Virtual Community of Practice (VCoP). This theory was first introduced by Wenger (1999), but is known in literature under different names. Examples are: electronic knowledge repositories (EKR) (Kankanhalli 2005), electronic communities of practice (Wasko & Faraj, 2000) and virtual knowledge sharing communities of practice (Ardichvili, 2003). The EKC can also be considered to be such a platform and will be called a Virtual Community of Practice. The basis for Virtual Communities of Practice lies with Communities of Practice. But since the ICT can transcend space and time, CoP’s are increasingly interested in the support of IT for their communities (Dubé, 2003). A virtual community of practice uses information technology to support knowledge sharing within and between communities of practice (Pan *et al*, 2002). It basically is an extension of the former CoP’s, only it is called virtual when ICT is the primary mode of interaction between its members (Dubé *et al.*, 2006, p.147). The interaction between members goes via e-mail, videoconferences, newsgroup and common databases and intranet, combined with more traditional media like phone and fax. VCoP’s preserve knowledge, facilitate communication, and accelerate collaboration between the members (Ardichvili *et al.*, 2002, Wenger *et al*, 2002). VCoP’s can be seen from a socio-technological perspective, which looks at the exchange of knowledge from the point of

technology whereby persons exchange knowledge with the usage of information technology (appendix H). We look at VCoP's from this perspective since we are looking at social interaction via information technology. VCoP's have advantages over CoP's. First VCoP's can save holding meetings on regular basis Dubé *et al. (*2003). VCoP's can 'perform a central role in promoting communication and collaboration between members who are dispersed in both time and space' (Correia *et al*, 2010) and therefore to not need to always meet at a location. Because of this, the latest research around VCoP's suggests that platforms are becoming the management tool of choice for an increasing number of NMSC's. This includes industry leaders like British Petroleum (Cohen and Prusak, 1996), Shell (Haimila, 2001), Hewlett Packard (Davenport, 1996) and Ford, Xerox, Rayton, and IBM (Ellis, 2001). Annother reason why VCoP's are becoming popular management tools is that VCoP's are also possible when its user base consists of larger geographically distributed groups of individuals (Wasko and Faraj, 2005). They do not necessarily need to know one another. Even face-to-face meetings might not be included for these communities. Another fundamental difference between VCoP's and CoP's is that the CoP's can start and stop at every moment in time. Next to that, they can emerge spontaneously and they are not restricted by official organizational regulations. Lesser and Everest (2001) found that the huge difference is that VCoP's should be bounded by regulations in order to function effectively. Lesser states that VCoP's need to be: 'managed and should be part of a systematic and strategic approach by the organization to promote the effective management of intellectual capital'. It is up to the management of organizations to make sure that these VCoP's occur 'spontaneously' and that they stay intact due to shared interest of the members.

3.3.3. The VCoP users

VCoP's should be designed in such a way that it supports the different needs and interests of members in the community. Members have namely different levels of interest and therefore users have different levels of participation. The different levels of participation can be explained by interest of the members. Wenger (2002) distinguishes 4 types of community members, based on their level of participation. The first type is community coordinator. Whether the community is spontaneous or mapped out, this person connects the community members and organizes events in the community. Next to the community leader, other users exist:

- Core (group) members
- Active (group) members
- Peripheral (group) members or 'free-riders' in a VCoP (Wasko & Faraj, 2005)

These members are divided based on degree of participation. Figure 5, displays them:

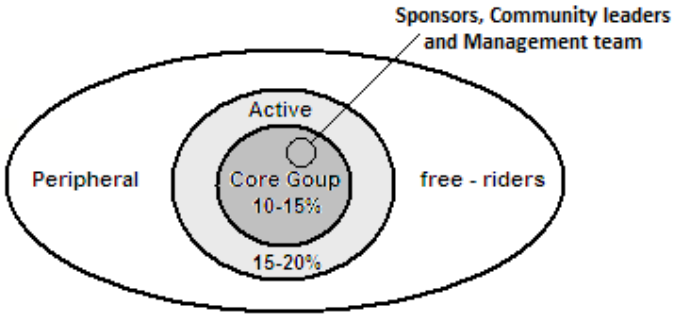


Figure 5: 'Degree of community participation (Wenger *et al*. 2002, p57)

The core group members:

The centre consists of the core group members. This is a small group, mostly consisting of 10 to 15% of the total population. These people are actively participating in debates and discussion but also on

forums. They are the active heart of the community. By directing the community to relevant topics, leading certain parts of the community and helping the coordinator, these members are very active. When a community is more mature, they become more and more responsible for community leadership (Wenger, 2002). In short it can be said that the core group members are leading the community, inspire others to join (Probst 2008), and direct the community to relevant topics.

The Active Members:
Active members are less fanatic as the core, but do attend at meetings regularly and participate occasionally. This can also be sharing documents once in a while. The size of this group is about the same or slightly bigger as the core group but less active.

The Peripheral:
The largest section of a community is the peripheral layer. This group is not sharing and is more watching from the side lines, observing the core –and active members. In the VCoP literature, peripheral members are sometimes mentioned as so-called 'free-riders' or people who are lurking (taking advantage without contribution according to Wasko and Faraj, 2005). This, because these members mostly do not contribute to the community and only use the community for their own good.

Administrators:
Bourhis, Dubé and Jacob (2005) also describe Administrators. They are responsible for Judging content. They also define Knowledge Intermediary Roles. These are not in the scope of this research since the EKC does not have these functions or they are hosted via other functions. In the future of the EKC this function will be taken over by section leaders. The section leaders are responsible for the best practices on their section and thereby take over the task to judge the content.

An important aspect of the levels of interaction is that the users can shift between the levels. This depends on their input and effort. For example, when a active members considers the topics not relevant anymore, he or she might stop using the community. Therefore it is important to have relevant items. "To draw members into more active participation, successful communities build a fire in the center of the community that will draw people to its heat" (Wenger *et al.* 2002, 58).

4. Blocking Factors influencing sharing on a VCoP

We have reviewed the types of VCoP users share, what they share and with whom. However this all assumes that with the given theoretical ingredients, the process goes well. Practice proves different. This section first describes the ideal outcome. Afterwards it describes the factors preventing the ideal situation from happening.

4.1. Successful knowledge exchange on a VCoP

As stated before, the sharing of knowledge consists of a sender and recipient whereby organizational, social and contextual factors influence the process. A successful knowledge transfer manifests itself when the recipient successfully applies knowledge or successfully improves its performance. When the transfer takes place, the recipient is affected by the experience of another(Kogut and Zander, 1992) who decides to share his/her knowledge. The transfer is considered successful when it takes place without eventfulness (Szulanski, 1996). The recipient is imitating or replicating the knowledge successfully, meaning that knowledge transfer can be measured by

changes in knowledge and / or changes in performance (Argote *et al.*2000). Szulanski (1996) divided the changes in performance by investigating the effects per stage, called eventfulness. This is described in Appendix J. Additionally to that, Bourhis, Dubé and Jacob (2005) state that other indicators of the knowledge transfer are increased level of activity and satisfaction. Satisfaction arises because the new knowledge adds values to its members (Cothrel & Williams 1999; McDermott 1999; 2001) and thereby provides value to the organization (Lesser & Everest 2001). The theory describes how a VCoP can and should function optima forma. Although there is no real consensus in literature of what success for a VCoP actually is, literature agrees on two forms of success (APQC 2001: Wenger *et al.* 2002): Effectiveness and Health. Bourhis, Dubé and Jacob (2005) summed up the following indicators of Effectiveness:
1) the meeting of the community's initial objectives (Cothrel & Williams 1999);
2) the value provided to the organization (Lesser & Everest 2001); and
3) the benefits to its members (Cothrel & Williams 1999; McDermott 1999; 2001).
For indicators for Health they summed up the following:
1)Member satisfaction
2)Level of activity.
All of these indicators only count when users share. This means that *if* users are using the VCoP and *if* users are sharing, EKC can become a successful VCoP. This assumption is also the dependent variable, and the first step of the model is given in figure 6:

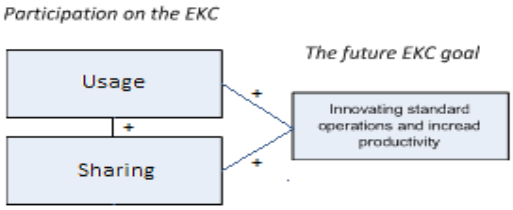


Figure 6: Usage and Sharing conditions for the dependent variable (the future EKC goal)

Due to the fact that it is very difficult to measure increase of financial performance, other key indicators are drafted by TME for the EKC to realize:

- Time savings for employees, via new methods and working ways.
- Prevent users of re-inventing the wheel because it is already on the EKC
- Faster finding solutions when employees have questions
- Create awareness of new best practices
- Provided a place to work together for various geographically dispersed users
- Access to the best practices and an library with the latest versions at any time

4.2. Difficulties in Sharing on VCoP's

Andersen (1996) states that before knowledge transfer can be successful in an organization and be managed in such a way, it is important to evaluate knowledge management activities and/or knowledge resources first. With the EKC management and available EKC members, this aspect is covered. When then trying to achieve successful knowledge transfers, different factors are interfering between the sender and the receiver. Different factors can be influenced which stand in the way of successful knowledge transfer (Davenport, De Long and Beers, 1998):

- Technical and organizational infrastructure
- Standard, flexible knowledge structure
- Knowledge-friendly culture
- Clear purpose and language
- Change in motivational practices

- Multiple channels for knowledge transfer
- Senior Management Support
- Link to economic performance or industry value.

These variables function as the starting point for our model. These variables will be extended with other theories and models. Andersen (1996) adds to Senior Management Support that there must be a clear from of leadership. While transferring knowledge, it is important to governing/ administrating knowledge activities and/or knowledge resources (Szulanski, 1996). The focus will be on the factors that causes employees not to participate in the first place or why employees are not willing to share (and stay in the peripheral layer). This is still a gap in literature as Ardichvili *et al.* (2008) also found out: 'Despite the proliferation of VCoP's in business organization around the world, very little in known about factors leading to their success or failure'. It is therefore that also failure characteristics from CoP's are used and Knowledge Management literature which is in some cases related to VCoP's. The characteristics on which literature agrees should be available or implemented in a good way not to be a blocking factor for knowledge transfer in a VCoP. We have divided all variables under the following chapters: Knowledge friendly *Culture, People, Strategy, Context, Technology and the Characteristics of the knowledge transferred.* In appendix K is an overview drafted which exposes the different writers, their criteria which affects a VCoP and the category we have put them in.

4.2.1. Knowledge Friendly Culture

Company culture is considered to be the shared values, beliefs and practices of the people in the organization (McDermott and Dell, 2001). Culture exists in visible aspects and deeper levels. Visual aspects are missions and visions, while deeper levels are the way how people act, and how they interrelate with one another. The company culture influences whether people are motivated by other colleagues to share and if sharing is appreciated. Abou-Zeid (2004b) notes that: 'the value organizations place on knowledge shapes the culture that either facilitates or hinders transfers'. In case of failure of knowledge management, it is often claimed that the cause was organizational culture (McDermott, 1999). This because the organizational culture did not encourage creation and sharing of knowledge (Gupta and Govindrajan, 2000). It is not easy to create a culture that encourages and promotes knowledge sharing. If fact, because a culture is so difficult to change, it is advised to adapt the VCoP knowledge sharing culture to the existing company culture (McDermott *et al*, 2001). For Toyota this is an advantage since it is known for its sharing culture (Dyer, 2000) The goal is to create a culture on the EKC which encourages and allow people to participate and transfer. Knowledge sharing initiatives often fail when the knowledge sharing of the company is not in line with the company culture, not in line with the existing core values and if there are no visible and invisible dimensions of a sharing culture. Therefore we hypothesize that:

H1: *A Knowledge friendly company culture which promotes sharing, is positively associated with EKC members use of the EKC and their sharing of knowledge.*

Trust in members and management

A knowledge friendly culture which promotes sharing requires its members to trust each other. Otherwise members might refuse to share or accept the contribution from others. 'The reason for such actions includes anti-trust issues embedded in organizational culture' (Augier & Vendele, 1999; Falconer, 2006; Lucas, 2006). The advantage of common trust is that employees are more willing to share knowledge and that they are more supportive and committed to share knowledge. Trust is defined as: ''confidence, a strong believe in the goodness, strength, reliability of something or somebody', 'responsibility' have trust in (verb): 'believe in the honesty and reliability of someone of something', 'have confidence in', 'earnestly hope' Oxford English Dictionary (2010). Lack of trust is one of the main barriers of knowledge sharing (Szulanski, 1996). Building and maintaining trust is

very important because trust is '*the glue that binds the members of a community to act in sharing and adapting manner. Without trust, members would hoard their knowledge and experience and would not go through the trouble of sharing with others'* (Nichani and Hung, 2002). According to Fang and Chui (2010) are referents of trust in relationship with sharing behavior of community members important variables influencing knowledge sharing in virtual communities. Referents of trust are divided into trust in manger and trust in members. Trust in management refers to the belief of members that the management is able to lead the community and thereby show concern to the needs of members and do not take advantage of members input on a VCoP. According to Fang and Chui (2010) are members willing to participate on a VCoP if they consider that management cares about their rights and needs. Therefore the following hypothesis is proposed:
H2: *Trust in management is positively associated with EKC members use of the EKC and sharing.*

Next to the fact that management can give the VCoP members a feeling of trust, there is also the trust in other members. This, because the members must perhaps more rely on the input of others than on a leader. In a VCoP, it can be difficult to trust each other because the members do not know each other. But, in VCoP's, people are perhaps more easily willing to share because they can contribute anonymous. Trust in other members consist of believe in other members ability to provide adequate input, the believe that other members do not abuse a member his or her input and the believe that other members are also willing to help within their capacity (Fang and Chui, 2010). Next to that Kankanhalli(2005) adds that there must be trust in other members that they share their best knowledge as well. The probability that content is lost or abused when shared and interdependence on others is also found to be negative by Rousseau, Sitkin, Burt and Camerer (1998) It is therefore that the following hypothesis is proposed:
H3:*Trust in other EKC members is positively associated with EKC members use of the EKC and sharing.*

4.2.2. People

As can be seen in the figure 3 people are at the heart of transferring process of knowledge. Without people communicating with each other there is no interaction and available content. When people can easily communicate, this prevents people from leaving before even looking at content and interacting with the community.

Language

Although English has established itself as the worldwide scientific and business language, many people still lack the proficiency in English to understand and communicate complex concepts and reasoning (Van den Branden, 2001). This means that *if* English is a blocking factor for members of a VCoP, especially with business related concepts, this blocks transfers. People do not get each other's demands and solutions and thereby do not understand each other. Ease of communication demands and creates a certain intimacy between sender and recipient (Marsden, 1990). A distinction can be made between business language and terms and English as a language as such, but important is that users are understanding the (business) language. Therefore we propose the following hypotheses:
H4: *Good understanding of the English language imposes a positive effect on use and sharing on the EKC.*
H5: *Good understanding of the business jargon imposes a positive effect on EKC members on use and sharing on the EKC.*

Characteristics Recipient

Several factors can be considered to be barriers to usage of the EKC. These can be social and technical barriers and both have been listed and researched (McDermott 1999). This section will focuses the social perspective and the technological barriers from the recipient point of view. The recipient has a lot of similarity with the characteristics of the sender. But, when an EKC members sends information they are not considered to be a free-rider anymore and we assume that these users are senders. This is based on the distinction between 4 types of users of paragraph 3.4.3. Recipients of the EKC are considered to be Read-only members and Community members, because they use the EKC, but do not share. The distinction between senders and recipients is conceptual though, in that the recipient and sender can be the same individual at different points in time (Kankanhalli, 2005). Starting point for recipient are the free-riders. They are taking advantage without contribution according (Wasko and Faraj, 2005). But before a recipient can start free-riding, he or she must able to find the knowledge and know what kind of knowledge to look for. VCoP tool proficiency is therefore demanded according to Lee *et al* (2006) because without this technological knowhow, the recipient cannot start using the EKC in the first place. When the members are able to find content, then the next blocking factor can be considered motivation. When EKC members for example do not see benefit in using the EKC to find information or best practices Ardichvili (2003) then they are not motivate to participate on the EKC. The general recipient on the EKC can also lack motivation which can express itself into outright rejection of implementing the transferred knowledge or to participate at all. When users are willing to improve their work (Szulanski, 1996) or if they are satisfied of their own EKC usage, it is likely that they will participate more on the EKC. A reason to reject might be because of the 'not invented here' syndrome (Katz and Allen, 1982), which might be explained due to lack of trust in management or other members or the information itself and that users therefore choose to use the expertise of close known colleagues.. Next to rejection on purpose, it is also possible that the recipient lacks the ability to successful use the content. This because the user has no idea what is available. The ability also correlates with the type of user. More active users have also more awareness of what is available and how to get this content. Therefore we propose the following hypothesis:

H6: *VCoP tool proficiency has a positive impact on participating on the EKC*

H7:*Relevance topics on the EKC have a positive influence on EKC participation*

H8: *Intrinsic motivation of an EKC member has a positive impact on participation and sharing on the EKC, even whit lower generalized trust.*

Characteristics Sender

When everyone chooses to free-ride, the electronic network of practice would cease to exist (Wasko & Faraj, 2005). Therefore it is necessary that VCoP's also have members who share, or contribute.

A sender in a VCoP must have a bit of technological knowledge in the first place to log-in and to work on the database. It is therefore that the employees need to have technological provision and necessary IT skills to support the mutual engagement (Wenger, 1998). The posting of content on a VCoP mostly occurs when it improves the professional reputation of the sender (Wasko and Faraj, 2000) or when the employees have enjoyment in helping others (Wasko and Faraj, 2005).Enjoyment in helping others is the most important motivator for contributors on EKR's (Kankanhalli, 2005). Enjoyment of sharing is derived from the concept of relative altruism based on the desire of contributors to help other people with sharing knowledge (Davenport and Prusak, 1998). This altruism is a intrinsic motivation factor for users that they enjoy helping others by sharing their

knowledge. An individual contributes knowledge in an electronic network of practice primarily when (Wasko and Faraj, 2005): they are motivated to access, they view questions which are posted, they choose questions which they are able and willing to answer (Willing and codification effort).There are also reasons why users might not share. This is called information hoarding (Ardichvili, 2003). This causes that senders are not willing to share knowledge, because they think they will for example lose knowledge power (Davenport and Prusak, 1998) or they do not transfer due to the fear of losing ownership or a position of privilege (Szulanski, 1996). Losing knowledge power is not in question for accessing, but only for sharing. Another factor of influence is knowledge self-efficacy (Kankanhalli *et al*, 2005). Self efficacy is derived and related to Bundra *et al.* (1986) who came with the description of people and their perception what they can do with the skills they posses. When people gain confidence about their own qualities, this will increase self-efficacy. Kankanhalli (2005) writes that a sender must have confidence in the ability to provide knowledge to others and must think that he or she has the expertise to submit content. More believe in the own confidence serves as a motivator for employees to contribute. Next to that, the employee must also take the time and effort to formulate and post. Therefore we propose the following hypothesis:

H9: *VCoP tool proficiency has a positive impact sharing on the EKC*

H10: *Enjoyment in the EKC is positively associated with participating and sharing on the EKC*

H11: *EKC members who are more committed to the EKC are more likely to participate and share on the EKC*

H12: *When sharing is not perceived as loss of knowledge power, this increases sharing on the EKC*

H13: *Confidence that own knowledge will contribute to the organization increases sharing on the EKC*

4.2.3. Context

Transfers of knowledge within an intra-firm network are influenced by the context. A plant for example can grow within one context; it might grow poorly in another context. This is the same for knowledge transfers (Szulanski, 1996) on types of VCoP's. Characteristics like geographical distance and technology are considered to be characteristics of context of a VCoP. What has to be noted is that these contextual factors are internal, and thereby partly possible to influence by management.

Geographical Distance

Distance may make it hard to remember that a VCoP exists (Wenger *et al.*, 2002). Geographical distance is a barrier for tacit knowledge transfer because the success of the transfer depends until some extent on the intimacy of the relationship between source and recipient. This simplifies the ease of the communication. Several case studies have clearly indicated that geography does matter for knowledge transfer (Hildreth *et al*, 2000). For tacit knowledge, some kind of face-to-face meetings are required, so that the source can literally show the recipients how something works and can help the recipient in the beginning. However, for codified knowledge the use of VCoP's is not a problem since this kind of knowledge is easily transferable via documents and online communities. The codified knowledge contains explicit components and therefore does not require intimacy. An advantage of geographical distance is the global / departmental/ organizational perspective exchange possibilities and no limit to local peers or expertise. So geographical distance is becoming a problem if local peers or expertise is not available, and a VCoP cannot be the channel for the knowledge transfer. Therefore we propose the following hypothesis:

H14:*Geographical distance decreases EKC participation and sharing.*

H15:*Geographical distance decreases EKC participation and sharing when the information is considered difficult to codify.*

Technology

Technology deals with the question if the technology and the software work. The difficulty with technology is that if the technology does not work, transfer via VCoP's cannot either. However, this is not vice versa. ICT is a necessary, but not sufficient condition for success (Newell, Pan, Galliers, & Huang, 2001). This is also the cause of the failure of a number of expensive initiatives, due to over-reliance on technology for knowledge management (McDermott, 1999). This is because technological solutions seldom take into account the fundamental problems of transferring knowledge (Piattini, 2007). To start working on the EKC, the first technological barrier is access to the EKC. It might be that people do not know where to find the EKC or that they do not know how to access. The second technological part the users come in acquaintance with is the technology that enables them to browse around and participate on knowledge transfer. This is called information system quality and it includes aspects like user-friendliness and functionality of the VCoP(Yoo *et al*, 2002). User friendliness increases the chance of employees using the VCoP. Lee, Cheung, Lim and Sia (2006) did research about this user friendliness and called this 'Usability. If participating on the EKC is difficult (understand ability) and it is difficult to navigate on the EKC, people will ignore the EKC more easily. If users of the EKC find it difficult to transfer they will search for other possibilities to transfer. This ease of communication is closely related to the system quality (Wang and Fesenmaier, 2003). They found that if users consider communication to be difficult, then they will stop using it. They will not stop directly. First they might search for some kind of support (IT).If the support via technology does not support meets the standard of the users, they will reject these working methods and continue with (easier) substitutes. This can also occur when users think the topics or pages on the VCoP's are not relevant (Dubé, Bourhis, 2003). Yoo *et al* (2006) investigated the same, but from a management point of view. They found that the site management, via information technology, is supposed to provide help when users encounter difficulties because otherwise users are less likely to continue. Of course this is related to the level of comfort the members have with technology (Dubé *et al*, 2003).

H16: *Easy access to the EKC increases participation and sharing*

H17: *Good working Information systems positively influence participation and sharing on the EKC*

H18: *Help of IT increases participation and sharing when IS Quality is perceived badly.*

4.2.4. Stategy

As stated before, a VCoP needs to be guided. Earlier research is even indicating that the choice and availability of a leader and the support of a sponsor/coach is crucial to the success of a VCoP (Bourhis, Dubé and Jacob, 2005). But while the literature broadly defines the role of leaders in CoP's (Fontaine 2001), there is still a lot of research to do about facilitating of leadership in a virtual environment (Bourhis et Dubé, 2005). The leaders, managers and top management all influence and decide the strategy to follow for the VCoP.

Management

Bourhis et Dubé, (2005) came with the definition of a leadership team including three entities: (1) the management team of the organization, (2) the officially designated sponsor, and (3) the VCoP's leader. Probst *et al* (2008)stated that the VCoP's leader is fulfilling the same role as the designated sponsor. Bourhis, Dubé and Jacob (2005) gave the following distinction for leadership, in figure 7:

	Role	Description
Leadership roles	Community leaders	Provide the overall guidance and management needed to build and maintain the community. Community leaders are relevant for strategic importance of the organization and level of visibility.
	Designated Sponsors	Nurture and provide top-level recognition for the community while ensuring its exposure, support, and strategic importance in the organization.
Knowledge Domain roles	Subject Experts	Keepers of community's knowledge domain or practice who serve as centers of specialized tacit knowledge for the community and its members
	Core Members	Looked upon for guidance and leadership before or after a leader emerges or is selected:
VCoP Leadership team	Management team organization	Responsible for taking actions to ensure that the leader, supported by his/her coach, can effectively play its role in the community.
	VCoP leader	Leader of the VCoP, supported by sponsor and management

Figure 7: Leadership roles

Having a sponsor (senior manager) gives a VCoP organizational legitimacy and helps nurture, protect and secure resources (Fontaine, 2001) and thereby helping communities to reach their full potential (Lesser and Everest, 2001). Whereby the community leaders give the VCoP a reason for existence. In the early stages, but also during maturity, clearly assigned roles may become increasingly important (Fontaine, 2001). The VCoP needs strong leadership in order to reach the business goals. The leaders serve to motivate community members to collaborate (Lesser and Everest, 2001). In the beginning stage, it is important to have a sponsor who represents the management and is held responsible for the growing stage. In this phase, the way the sponsor deals with the technological aspect of participation is related to the VCoP's success in the end (Bourhis, Dubé *et al*, 2005). The function of the sponsor later becomes more of a controlling function with less controlling and as a result less formal structure. When there is less formal structure, leadership depends on interaction around expertise (Dubé *et al,* 2003), although this is not a problem when the VCoP is further developed, because then less leadership is necessary according to Wenger, McDermott and Snyder (2002). According to the writers, the management and sponsors of the VCoP are responsible for progress,

keeping the users informed and providing members with expertise and with IT collaborative tools. Next to that, is the sponsor needed to individually help members when they encounter problems or that he makes sure this is available.

H19: *Supportive Management positively influences members participation and sharing on the EKC*

H20:*Clear guidance of the designated sponsor is positively related to participating and sharing on the EKC*

Mission And Vision

A Virtual Community of practice should serve a goal or having a purpose. Having a purpose is vital for a VCoP and this purpose must be achievable via the Information Technology (Dubé *et al*, 2005). The vision defines the intended future state of the VCoP, the mission defines the fundamental purpose of the VCoP. The vision explains the reason of existence and how the VCoP intends to get there. With the mission and vision, clear objectives of a VCoP are made clear to the members. This provides the members with responsibilities and motivates them to contribute more actively according to Mc Dermott, 2003 and Probst *et al.* (2008) It is therefore that we propose the hypothesis:

H21: *Clear VCoP strategy is positively related to participating and sharing on the EKC*

4.2.5. Characteristics Best Practice

The knowledge transferred via best practices influences the success of the community. Unprovenness of successful materials might deter a user to work with input from the VCoP. With best practices, the content is supposed to be proven in the field already and is therefore shared with people. Causal ambiguity is a reason for failure of transferring knowledge (Mainly tacit knowledge failure). The ambiguity is likely to emanate from ambiguity about what the factors of production are and how they interact during production (Szulanski, 1996). Whether the knowledge contains tacit or explicit components also influences transfer via VCoP's. Literature agrees that transferring explicit knowledge via VCoP's is possible. Most writers state that it is impossible however to transfer tacit knowledge. Gertler (2003) rejects this claim by stating that the virtual community is strong enough; even tacit knowledge will flow across regional and national boundaries. The question is not between different types of knowledge but whether the knowledge can be sent from the sender to the recipient via the VCoP. As Kreiner (2002) says: '' *the point is that people co-ordinate themselves when the context is conductive to co-ordination. The context of a specific product, tacitly defined, is apparently conducive enough for people to seek coordination, to mobilize and utilize whatever the ideas and information they can find to contribute to a common solution across all components and modules''*. And when the people seek, mobilize etc. they interact with each other to provide themselves the necessary knowledge to act in a situation. Zander, Kogut (1995) contributed to the discussion of tacit an explicit by saying that degree of knowledge transferability should be measured by "the degree to which a capability can be easily communicated and understood'' (Kogut and Zander (1995). They say that the questions is why knowledge is not easily transmitted and replicated. For knowledge or best practice it therefore counts whether it is possible to codify it so it is possible to transfer via the VCoP. Codifiability captures the degree to which knowledge can be encoded, even if the individual operator does not have the facility to understand it. This is measured to the extent knowledge can be articulated in documents and software. Zander and Kogut (2010) also state that the information must be teachable. Because, if the document is available but it cannot teach the recipient how to improve his work via this best practice it is also not of any use. It is therefore that we propose the hypothesis:

H22: *When knowledge is codifiable into best practices, it has a positive effect on sharing on the EKC*

Model:

Al the variables described above can be visualized into a model. The link to economic performance or industry value (From Davenport *et al.*, 1998) is the ultimate goal the EKC want to achieve. This is the dependent variable. The mediating variable is the assumptions that users access and share. We divided them into three categories: users who can access and share, users who access and do not access. When the EKC users are actively sharing and participating, the EKC is working on its ultimate goal. The core group, multiple channels and the phase of the community are control variables. The Independent variables are divided into sub-categories. Figure 8 is showing the overview.

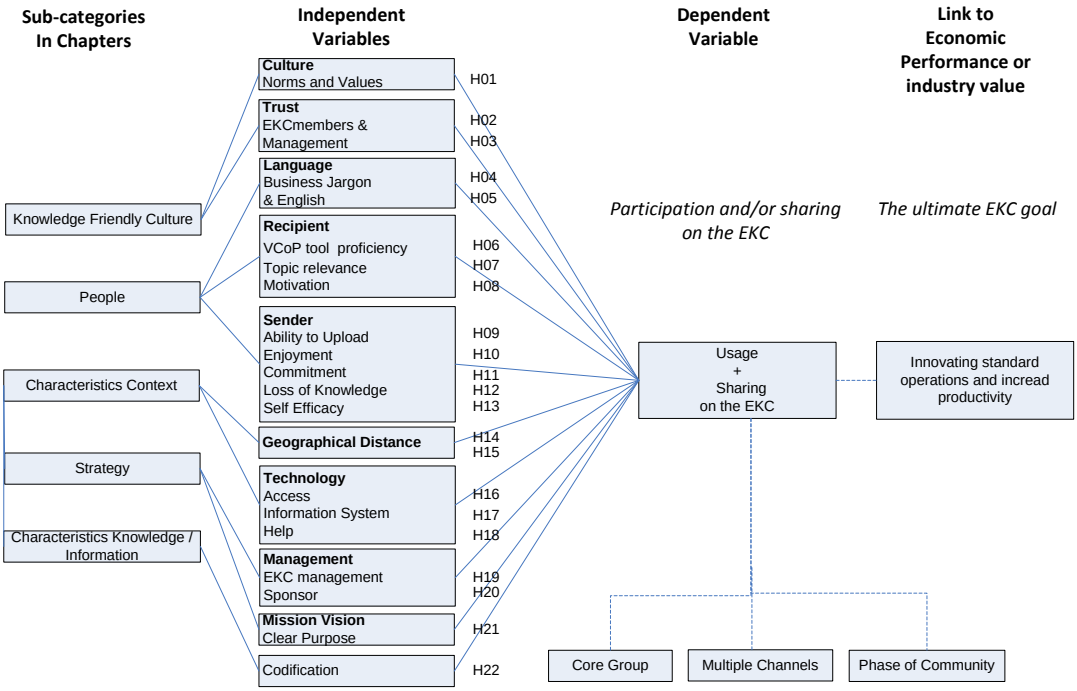


Figure 8: The EKC model

5. Data Collection

This research was carried between April 2010 and October 2010 in Brussels and send out to all NMSC's in Europe. The survey was conducted over a period of three weeks. This chapter describes the way the data is collected. First the unit of observation and the unit of analysis are described. The measuring instrument describes the differences in respondents and the measuring instrument. The chapter finishes with the validation of the constructs and demographics.

The Unit of Observation

The unit of observation is Toyota Motor Europe. The reason for choosing an automotive manufacturer is because these types of organizations offer an interesting opportunity to examine the organizational knowledge transfers. Automotive manufacturers are OEM's, meaning that they develop and manufacture the main part of the products. This has as a consequence that the cost and quality of the produced products also rely on the transferring of productivity enhancing knowledge (Lieberman and Asaba, 1997). Dyer *et al.*(2000) state that "Toyota, in particular, is widely recognized as a leader in continuous learning and improvement''. The reason why Toyota Motor Europe is chosen is because they offered the possibility to do research on the exchange of knowledge within the EKC throughout Europe.

The Unit of Analysis

By choosing the Unit of Analysis there are several options, all representing the persons or departments which form the unit of observation. By keeping in mind that Toyota is a multi-national company it is possible for the knowledge to flow on different levels of the network. We choose for Gupta *et al.* (2000) Nodal; i.e. a focus on the behavior of individual units. That is why the unit of analysis will be: The targeted TME and NMSC users of the European Knowledge center. This is because all these users should directly involved with the EKC. These users are divided over the big, middle and small NMSC's and over internal users at TME. In total these are about 600 NMSC users and 250 TME users of the EKC.

5.2. Measuring Instrument

This research project used a survey as methodology to collect the data. The data served to test the hypotheses. The questionnaire was split up in several parts using routing. This routing was based on the usage of the EKC. The first split was made whether employees have accessed the EKC or not. This question was asked using a Yes / No question. Further more in the questionnaire was made a split between users who access whether the uploaded documents or not. This question was also asked using a Yes / No question. An overview of the user types is given in figure 9.

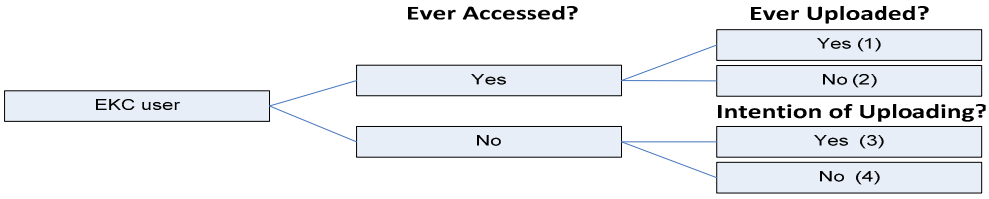


Figure 9: Different kinds of users questionnaire

The 4 user types are the same as the dependent variable: Participating / Sharing. More information follows in chapter 5.6:"The distinction between kind of users".

The users who did not access got excluded from a part of the research. This part of the research investigated how long users are active, the searching on the EKC, the impression of the EKC, the

content on the EKC, using the EKC and downloading documents and the usage of content from the EKC. Furthermore these users excluded from questions to investigate the difference between users who have uploaded documents and users who have not. Constructs who are in that case valid for all respondents like motivation to submit were included for users who never accessed as well. Noted must be here that some the question about EKC usage are biased. According to Kankanhalli *et al.* (2005) are questions like this possibly inflated because answers of self reported usage of EKR are not always reliable. With the help of WebTrends, is possible to compare the outcomes of the questionnaire with the real EKC usage.

The questions then were implemented into a software program based on LimeSurvey, an open source application available on the Internet. After programming, a website was hosted on http://www.ekcsurvey .com. The reason for hosting a separate website is because it looks more professional. A screenshot of the Website is given in appendix M. As stated, all questions were mandatory, except the open-ended questions. In order to show that the content was kept confidential, an 'note of privacy' shown before the questionnaire started. At the end of the questionnaire (Appendix N), a slot was shown, thanking the respondent for helping.

To analyze the data from the questionnaire, Window's SPSS is used from the Microsoft Corporation. The constructs were first tested for reliability using Cronbach's Alpha. The Validity was tested using a factor analysis to test if the constructs matches with the outcome of the factor analysis. The whole model was first tested for significance using a multiple regression analysis. After testing and making sure that the constructs were adequate and meeting the requirements for testing, the hypotheses were tested using F-tests and T-Tests. Introduction questions were tested using box plot's and Chi^{2-} tests.

5.3. Validation of questions and constructs

The questions for the survey were adapted from various articles combined with questions from the management of the EKC were also included. To make sure that the questions were understandable for the unit of analysis two pre-test were performed.

First pre-test

The first draft of the questionnaire was send out to the Customer Relations (CR), Customer Satisfaction (CS) and the Customer Experience (CE) department of Toyota Europe headquarters in Brussels, a total of 18 people. The first draft consisted of all the questions written in the scientific literature and placed in the intended order of questions. The test persons were asked to fill in the questionnaire and see if there were any technical irregularities, ambiguously worded questions, and/or difficult formulated concepts. Some questions about the information and content related to tacit and explicit knowledge were re-formulated and the order of questions was changed a little.

Second pre-test

The second and improved questionnaire was send out to Customer Experience (CE) department, one employee of Corporate Affairs and the EKC administrators. The reason that it was send out to the corporate affairs was because they wanted to know certain details about the possible outcome. The reason that it was re-send to the CE department was because they were already in the pre-test and they could therefore see if the changes were sufficient. Additional to that the CE employees themselves are experts in European questionnaires and are therefore able to filter bad formulated

questions for the intended units of analysis. The questions were sorted as suggested by the test group and therefore not always all questions per construct were in the survey asked together. Because it is desirable to have at least three questions per construct (Kim and Mueller 1981), the constructs operationalized with three questions. Sometimes these questions were place in different parts of the survey to make it more logical, but they were joined together again after filling in the questionnaire.

Constructs

Figure 10 provides the definitions of the constructs. The questions in the survey are measuring the constructs. The questions are when possible based on prior studies to increase the validity. Next to the questions based on the literature, questions were added which are relevant for the EKC administrators.

Construct	Definition	Writers
Culture	The values, believes and practices that an organizations places on knowledge which shapes the culture that either facilitates or hinders transfers	Abu-Zeid(2005), Mc Dermott & O'dell (2001)
Generalized Trust	The belief in, and willingness to depend on, the other party as the center of knowledge exchange. Trust in management (refers to a member's belief in the capability, benevolence and integrity). Trust in members (believe in other members' benevolence, integrity and abilities.	Fang & Chui (2010), Davenport & Prusak (1998)
Language	Possessing the knowledge to understand the special technical jargon and communicating language	
Ability (VCoP tool proficiency)	Lack of IT knowledge (the level of comfort of members with technology) -Ability to access	Dubé *et al* (2003)
Topic's relevance	Whether the topics and content discussed are relevant to the daily work of most members	Dubé, Bourhis (2003)
Leadership / Motivation of Management	Employee roles to motivate community members to collaborate	Probst (2008) based on Lesser and Everest (2001)
Sponsorship / Guidance of management	Senior executives who help to reach the full potential of the community	Wenger and Snyder, 2002
Ability (VCoP tool proficiency)	Lack of IT knowledge (the level of comfort of members with technology) -Ability to upload	Dubé *et al* (2003)
Enjoyment	Engaging in intellectual pursuits and problems solving because it is challenging or fun and if feels good to help	Wasko and Faraj (2000), Kollock (1999)
Commitment	A sense of obligation to the network and organization	Wasko & Faraj, Constant *et al* (1996).
Loss of knowledge power	The perception of power and unique value lost due to knowledge contributed	Gray (2001)

Self Efficacy	The confidence in one's ability to provide knowledge that is valuable to the organization	Kankanhalli (2005), Constant *et al* (1996)
Information system quality	The resources available to allocate the community	Yoo *et al*, 2002
Geographical Distance	Dispersion of physical location of participants which causes lack of face-to-face interaction that hinders or limits the retrieval processes	Dubé *et al*, (2003) and Wellman & Gulia (2000)
Mission Statement and Vision	A short written description of the aims of a business + The ability to imagine how a Industry develop in the future and to plan in a suitable way	Oxford Dictionary
Codification effort	The degree to which knowledge can be encoded and the time and effort required to codify and input the knowledge	Zander and Kogut (1995) and Kankanhalli (2005)

Figure 10: Operationalization of Constructs

5.4. Internal, External, Construct and Statistical Validity

Paragraph 5.3 already dealt with the constructs and validity. But, there are also threats to validity. These are given in Appendix S and based on Shadish *et al.*, (2001). The construct validity treats the "reasons why inferences about the constructs that characterize study operations may be incorrect"(Shadish *et al.*, 2001). We prevented this using factor analysis and calculating the bivariate correlation. After the pre-tests "trust" was different formulated than the original literature. Trust is throughout literature broadly defined and trust is different measured. Kankanhalli (2005) measured generalized trust and Fang and Chui (2010) measure trust in management and other employees. We have mixed these and asked in the pre-tests if this was covering the construct. External validity is the validity of whether "cause and effect relationship holds over variation in persons, settings, treatments and measurements"(Shadish *et al.*, 2001).Due to the basis of scientific literature, this research is generalizable. Internal validity is "the validity of inferences about whether the observed co-variation between the treatment and outcome reflects a causal relationship" (Shadish *et al.*, 2001). We have tested this with multiple regression analysis. The Statistical conclusion validity treats the inferences about the correlation (co-variation) between treatment and outcome."(Shadish *et al.*, 2001). To ensure this, we used the book of De Vocht *et al.* (2008) and the statistical help of Professor van der Kaap thereby preventing that the wrong statistical tests were applied.

5.5. Applied statistical Tests

First the variables were tested via a factor analysis whether the variables belonged to one component. This was first done variable per variable. Then, all the answers were put into a factor analysis to see if the constructs of computed components were matching with the factors. According to Shadish Cook and Campbell (1979) this is necessary to see if questions are answering the intended constructs. Per construct the reliability was checked using Cronbach's Alpha (Cronbach 1951). For Cronbach's Alpha a value of 0.8 is considered to be good. 0.7 is considered acceptable and is the minimum the indicate adequate reliability (Nunnally, 1978) We have chosen that for example "Motivation"(0,656) is also still acceptable. An overview of the Cronbach's Alpha's in given in appendix O. The statistics were all carried out using a 5% significance level.

The factor analysis

Before testing the factor analyze, we have first examined the average variance extracted. According to Pallent, 2007 it has to be mentioned that we choose specifically for the Factor Analysis and not for the principal component analysis (PCA). The average values should be higher than the generally recognized .50 cut of (Wasko & Faraj , 2005). Because this indicates that the majority of the variance is accounted for by the construct came up with 68 components, from which 21 had an eigenvalue above 1.00. The eigenvalues differed from 1.011 until 8.782. These 21components were not corresponding with the 18 constructs from the beginning. Some questions for ("I contact document owner for additional information" and "I am willing to look at best practices from other markets") were omitted because they were covering multiple constructs. After that all other questions were supporting the right constructs. Appendix O is showing the constructs, together with the Cronbach's Alpha. For the constructs: Codification effort and Enjoyment 1 question omitted from the variable to improve the construct's reliability. SPSS itself indicates which questions can be removed to increase reliability. The next step was turning the clustered variables into computed variables were the sub-questions are bounded together. Standard deviations and averages are calculated with that as well. This was done using Syntax programming via SPSS. For example Information System Quality was clustered with the following command: 'COMPUTE Ability=MEAN(IS_quality01 , IS_quality02 , IS_quality03 , IS_quality04).EXECUTE.

Multiple Regression and ANOVA

When all the constructs are available, we've first tested the whole model (Figure 8.) The model we proposed, the constructs are influencing the dependent variable: The link to economic performance or industry value (From Davenport *et al.*, 1998). TME describes the industry value for the EKC as: Time savings for employees, via new methods and working ways and Create awareness of new best practices etc. We first test whether the independent constructs are in line with the dependent variable and if the model is significant. As can be seen in Appendix P, the constructs have *no* significant influence on innovating the standard operations and the model was rejected. We have then tested a new model, with Usage of the EKC and Sharing as dependent variable (Chapter 6.4). Usage and Sharing of the EKC has a significant relationship with the independent variables and will function as the dependent variable.

Student T-tests

To test whether there were differences between types of users (page 33, distinction between types of users) we have used the independent t-test. The independent t-test starts with two a-select samples and a normal distribution. Since the not all user groups contained more than 30 users, we have first tested for normality. With the T-test, the null-hypothesis states that both population averages are equal (H_0: $\mu_1 = \mu_2$ & H_a: $\mu_1 \neq \mu_2$). We want to investigate if the average independent variables differ between types of users. With the Levene's Test for Equality of Variances we tested whether to use the t-test for 'equal variances' or 'equal variances not assumed'.

5.6. Survey administration and demographics

First, an e-mail was send out to 800 users with log-in possibility, whether they used the EKC or. All the possible users have access to the EKC and participation is voluntary. Second, all users were informed with the EKC newsletter were a link and a short introduction story was added. This had the advantage that the users who were not included in the first e-mail also were made aware of the questionnaire and had the opportunity to fill in the questionnaire. After 2 weeks a reminder was

send out to remind the employees to fill in the questionnaire. In both e-mails was the link to the survey attached and a possibility to paste the URL into their search-bar of their internet browser. The website was possible to access with Google Chrome, Firefox and Microsoft Internet Explorer.

The total population of the EKC (N) is 800 users. Meaning, that they have the possibility to access and upload, but it is not sure whether or not they do this. At the moment the questionnaire was send out, it was not sure how many employees had actually accessed, because this data was not available. 114 respondents were returned, from which 80 users filled the questionnaire in completely. The other 24 respondents could be used for part of the analysis, which makes the response rate 19%. The respondents were received from all kinds of departments, from all over Europe. Figure 11 displays the distribution of area of professions the respondents. Noted must be here, that the respondents correspond with the deviation of departments on the EKC although the Sales department is slightly smaller compared to the original size.

Area of Profession	Number of Responses	Percentage of Responses
After Sales	21	18,4
Logistics	2	1,8
Human Resources	9	7,9
Product communication	3	2,6
PPMD	21	18,4
Purchasing	1	0,9
R&D	3	2,6
Sales	30	26,3
Network Development	22	19,3
Other namely:	2	1,8
Total	114	100.0%

Figure 11, Areas of Profession

The distinction between kind of users

When the questionnaire was send out, all individuals were assigned a random number. This random number was generated with an automatic generator which randomly assigns respondents to numbers. This way of working with a random number identifier was advised by Wasko&Faraj (2005).With these random numbers it is possible to couple the results to the individual actions on the EKC, which can be seen via WebTrends to see if there was a match by individual participation and demographics. But, due to restrictions of privacy by Toyota, this check has not been carried out. The reason to still work with random numbers is because participation on the survey was not 100% anonymous. The NMSC users of the EKC have to log in via TARs (Trust Anchored Repositories) whereby TME uses can just access via typing in the URL:// EKC or clicking on a link to participate. Also cookies to re-start or finish a questionnaire could cause that the participant was not fully anonymous anymore. Therefore this research has been performed with random numbers representing the respondents.

To give a good overview of the difference between users, the users were split up in 4 groups. Later in the research, these groups will be used for statistical analysis as a clustered variable. The variable is based on whether the user ever accessed and whether he or she ever uploaded. This can be partly linked to the user groups of Wenger *et al.* (2002) in figure 5.
The variable (Type of Respondent) has the following distribution:

1) Accessed and uploaded (Core group members & Active members)
2) Accessed but not uploaded (Peripheral group members / Free riders)
3) Did not access, but tried to
4) Did not access, but also did not try to
The user profile of the respondents looked as given in figure 12:

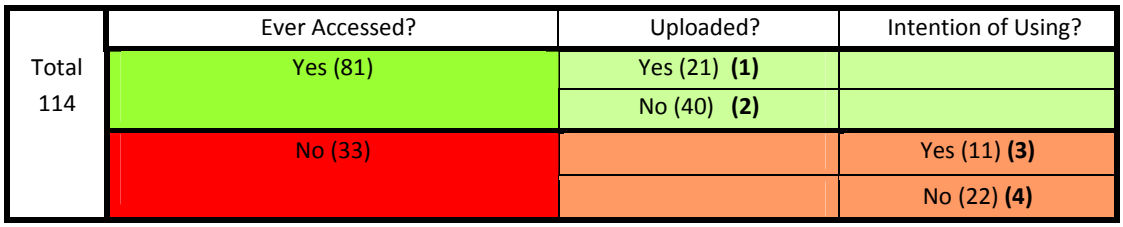


Figure 12, User profile of the respondents

Demographical Data

These demographical data were obtained in the introduction questions of the survey. With cross-tabs in SPSS was tested if there is a significant association between the categorical variables. This testing was done with the help of the Chi^2 – test. According to A. De Vocht (2008) it is necessary to check before testing if two conditions are met of the expected cel-frequencies:

- All expected cel-frequencies (E_{ii}) must be bigger or the same as 1.
- A maximum of 20% of the expected cel-frequencies (E_{ii}) may be between 1 and 5.

Table 1 Distribution of respondents of the EKC survey

Demographical Variable	**People who Accessed**		**People who did not access**		**Chi² -Test**
	N	%	N	%	Value
Respondents					
Total	81	(71)	33	(29)	
Distribution Employees					3,901[a]
NMSC	64	(56)	21	(18)	0.142
TME	10	(9)	5	(4)	0.162
Other	7	(6)	7	(6)	0.052
A= 2 cells (33,3%) have expected count less than 5. The minimum expected count is 4,05.					
Ever heard about the EKC					45.685[b]
Yes	81	(71)	17	(15)	
No	0	(0)	16	(14)	
B= 1 cells (25%) have expected count less than 5. The minimum expected count is 4,63.					
Read the newsletter					28.236[c]
Yes 79	68	(60)	11	(10)	
No 35	13	(11)	22	(19)	
C= 0 cells (0%) have expected count less than 5. The minimum expected count is 10,13.					

As can be seen are most Employees NMSC users (74%) compared to TME (13%) others (12%). The majority of the respondents has heard about the EKC (86%) and they read the newsletter (79%).

Missing Data

The missing values in SPSS were given the number 999, to indicate that this is a user missing value. The values missing were kept out of analysis; in order to avoid that SPSS indicated them as variable not complying with the condition. We have used 'filter variable' for this.

5.7 Control Variables

Not included in the literature part, but necessary to fully understand the situation of the survey when carried out are the control variables. These were tested with the survey as well, and literature was also studied before Operationalization of the constructs. These control variables help answering the question:

Lack of a Core Group

Distance may make it hard to remember that a VCoP exists (Wenger *et al.*, 2002) it is therefore that it is important to have a core group (Probst, 2008). These persons regularly put input into a VCoP, create awareness, ask questions and give answers. This leading group thereby inspire others to join into the community as well. Without a core group, the community stays very input driven from management and thereby does not create an interaction between members because of the fact that there is need for it. In fact, as Landqvist and Teigland (2005) found out in their research, a successful community is in need of a core group and if there is a core group then this is a indication of success. Having a core group namely prevents the community of just having so-called 'free-riders' or people which are lurking (taking advantage without contribution according to Wasko and Faraj, 2005). The core group generates a form of leadership depending on interaction around expertise (Dubé *et al*) and sustaining and motivating the core group members is essential because the inspire others to join and create awareness (Probst, 2008). Even free-riders benefit a lot from core group members. In summary we can say that having core group members is an indication of a successful community if they are motivated and they make the whole community more able to reach its intended goals.

Phase of Community

The phase of the community influences different kinds of threats for a VCoP. In the beginning, there is a lot of input from managers with the expectation that the community takes over initiatives. When and if the community takes over, it is likely that a core group of members make people return. Important in the whole process is the degree of institutionalized formalism: the degree to which a VCoP has been integrated into the formal structure of an organization. (Dubé (2003) *et al* found out that this was very important for continuity)

Dubé *et al.* (2003)investigated the different the impact of structural characteristics on the launching stage of VCoP's. They found that: 'The larger environment, including management style and the organizational, cultural, and political context into which a VCoP is formed seems to be the most determining structural characteristic that facilitates or hinders its success at the launching stage'. Structural and cultural factors as powerful determinants of short-term success at the early stages (Dubé *et al*, 2003). Getting to know what could be relevant to other members, evaluating the appropriate level of details and being aware of the legal constraints attached to information are skills and knowledge members have to develop (Hayes, 2001). A recommendation that Dubé also gives for the launching stage is face-to-face meetings, because they stimulate the socialization process. When the community is aging other problems are arriving. Building the trust and the sense of belonging are

then necessary for open exchange and sharing. And they may be much more difficult through computer-mediated interactions (Handy, 1995; Hildreth, Kible, & Wright, 2000).

Multiple channels for knowledge transfer

Davenport *et al.,* (1998) described in their theory "Multiple channels for knowledge transfer', which is shown on page 19. The scope on this research was only on the knowledge transfer via the EKC. We did however questioned whether the respondents preferred substitutes of the EKC.

6. Results

In this chapter, the results are presented. The chapter starts with the dependent variable and the model in section 6.1 In section 6.2, the hypothesis are presented with the results. In section 6.3 we look closer on factors that prevent users from using the EKC, with for example the role or sponsors and management. In chapter 6.4 we look closer on what prevents EKC members from sharing on the EKC.

6.1. The Dependent Variable:

The original dependent variable was the link to economic performance (LTEP) or industry value (Davenport *et al.*, 1998). The relationship of LTEP in the model caused the whole model to be insignificant. Thereafter we tested whether the model is significant when another variable is applied: Usage of the EKC and Sharing. Usage and Sharing on the EKC has a significant relationship with the independent variables and will function as the new dependent variable. With this variable we can see whether there are any significant differences in characteristics between all types of users. Lee *et al.* (2006) already indicated that reasons for not sharing are diverse and complex and that there is less known about withdrawing then submitting. Also, there is little research about the differences between types of users. When testing the model significance we used a multiple regression analysis, with a ANOVA variance analysis. Usage and sharing on the EKC (as a clustered variable) is a construct from the factor analysis. Appendix Q is showing the outcome. Appendix Q is showing that the determination coefficient R^2 shows that over 66% of the variation in sharing and accessing is explained by the independent variables. We also used the ANOVA table with the variance analysis. With that we tested if the whole model is significant. With a F-value of 2,262 (Sign < 0,05), this model is significant

Correlations between independent variables

Now we know that 66% of the decision to participate and share on the EKC is explained by the independent variables. The independent variables might have a relationship between each other as well: Correlation. With correlation we test if two variables are related. Correlation defines the *strength* and the *direction* of two variables (De Vocht *et al, 2008*). The variables were tested via 'Analyze – Correlate – Bivariate'. An important condition for the multiple regression analysis is that there is no 'multicollinearity', meaning that independent variables measure the same. This can be checked by the bivariate correlation coefficient. Multicollinearity exists when correlations of $|r| \geq 0{,}9$ exist. There is one problem with computing because the dependent variable needs to be included too. This is solved by replacing the dependent variable with the command 'WITH' while executing the syntax file. Appendix R is showing the correlation between de independent variables. The outcome is that none of the independent variables measure the same. To test the strength of the relations between the independent variables the coefficient of determination (R^2) is used. This is the square of R. The coefficient of determination (R^2) has a range of: $0(=0\%) \leq R^2 \leq 1(=100\%)$ and is considered strong relationship with a relation of $|r| \geq 0{,}8$ (64% of the explained variance). The strongest relationship in this research is the relationship between Self Efficacy and Enjoyment of Sharing ($.557^{**}$). This relationship is not unusual since Davenport and Prusak (1998)already found out that people who share their knowledge can be driven by enthusiasm.

6.2. Hypothesis

As stated in paragraph 6.1, the model with the Link to Economic Performance or industry value as dependent variable is not supported. The model with Participation and Sharing is. Figure 13 shows the model with the outcomes of the questionnaire.

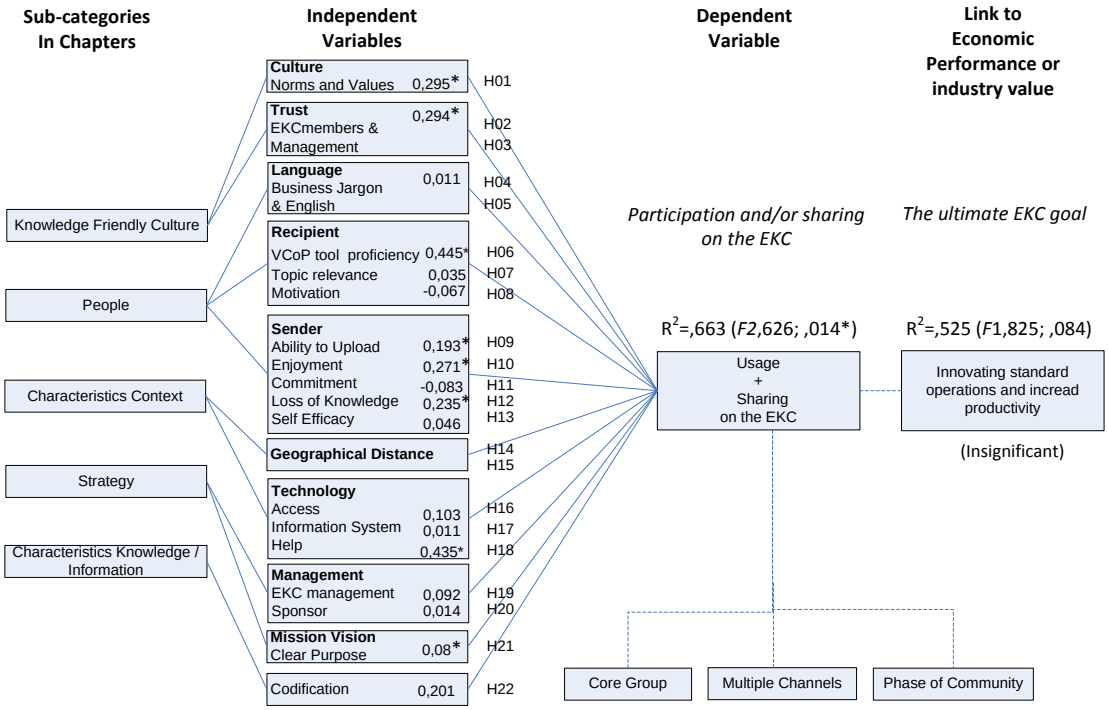


Figure 13, Relationships between the Variables.

Now we have the new model and the relations, we would like to summarize which factors are influencing usage of the EKC and the decision to share according to the questionnaire (Figure 14). We do this with the hypothesis and summarize our conclusions in the sections afterwards:

Construct	Hypothesis Test Decision to access/do not access	Hypothesis Test Decision to share/do not share
Culture	H1 not supported	H1 not supported
Generalized Trust	**H 2,3 supported**	H2,3 not supported
Language	**H 4,5 supported**	H4,5 not supported
Ability (VCoP tool proficiency)	**H 6 was supported** **H 9 Not supported**	H 6 was not supported H 9 not supported
Topic's relevance	H7 not supported	H7 not supported
Motivation	H8	H8
Enjoyment	H10 not supported	**H110supported**
Commitment	**H11 supported**	**H11 supported**
Loss of knowledge power	H12 not supported	**H12 supported**
Self Efficacy	H 13 not supported	**H 13 supported**

Geographical Distance	H14 not supported H15 not supported	H14 not supported H15 not supported
Information system quality	H17 not supported	H17 was not supported
Help	H18 not supported	H18 not supported
Leadership / Motivation of Management	H19 not supported	**H19 supported**
Sponsorship / Guidance of management	**H20 supported**	**H20 supported**
Codification effort	H22 not supported	**H22 Supported**
R^2	0,663	
Adjusted R^2	0,411	
F	2,626*	

*=P<0,05 , **=P<0,01

Figure 14, Overview Hypothesis

As can be seen, for example Codification effort is not influencing the decision to access the EKC. This is understandable since the task of codifying knowledge into documents is more related to the decision to share. This counts also for self efficacy and loss of knowledge power. Because of this distinction, we will first describe factors influencing the decision to access . Chapter 6.4 describes to blocking factors for sharing.

6.3. Blocking factors usage of the EKC

There are a lot of factors preventing users from using the EKC. In the introduction questions we have asked whether the respondents actually know the EKC. As can be seen before in Chapter 6, 16 respondents never heard of the EKC (14%). This is a strange number due to the fact that these respondents are in the list of the newsletter and are considered members of the EKC. They do receive the newsletter, but as it turned out: they never read the newsletter. We then decided to first have a look whether the newsletter made any difference for usage of the EKC.

The Newsletter

The EKC uses a newsletter to inform employees about the latest status and new facts on the EKC. It is intended to create awareness and it should motivates employees to access. With a reliability of 95% it can be said that there is a statistical significant relation between people who read the newsletter and whether people access. When looking at the strength of the relation, the Cramér's V test is used to calculate the strength. The Cramér's V has a value of 0,498 meaning that there is a average strong relationship (De Vocht, 2008). This is also seen via WebTrends. A measurement was set to see if there was an increase of visits when the newsletter was sent out. As Appendix T shows, there is a peak of users accessing the website after the newsletter has been send. Also the newsletter is a way of gaining new users, since 16 percent of the awareness of the EKC came from the EKC newsletter (source: the questionnaire). When we now look at reasons why people are not accessing we can excluded the fact that they were not aware that the EKC exists. It is now interesting to see why do not access.

Access; yes or no?

We have first tested the independent variables on differences between respondents who access and respondents not accessing. We started with the Levene's Test for equality. All variables were tested using the Levene's test. The variables with Equal Variances Assumed (EVA) are shown in the second column. The variables with Equal Variances not Assumed (EVNA) are shown in the first column. The outcomes show that Language, Trust and Ability to access give a significant difference in the decision to access or not with EVNA. From all the variable tested with the independent sample t-test when Equal Variance is assumed, 'Commitment' and 'Sponsor' have a significant difference with accessing the EKC or not. An overview of the applied tests in the decision to access is showed below in figure 15.

Variable	**People who Accessed**		**People who did not access**			
	Mean	(SD)	Mean	(SD)	T_{EVNA}	T_{EVA}
Self Efficacy	2.39	(0.48)	2,59	(0,63)		-1,41
Commitment	2,54	(0,49)	3,33	(0,55)		**-6,18****
Codification	3,15	(0,64)	3,13	(0,63)		1,78
Sponsor	2,63	(0,70)	3,25	(1,02)		**-3,00****
Enjoy	2,41	(0,69)	2,41	(0,81)		0,46
Language	0,60	(0,88)	1,31	(1,34)	**6,57***	
Ability	1,62	(0,78)	3,68	(1,14)	**7,53****	
Speed	2,29	(0,91)	2,13	(0,83)		0,51
Motivation	3,20	(0,71)	2,89	(0,97)		0,55
Leadership	2,46	(0,76)	2,16	(0,76)		0,67
Trust	2,67	(0,06)	2,43	(1,77)	**12,58****	

Figure 15, Decisions to access . *=P<0,05 , **=P<0,01

Ability to access.

As shown in figure 15, the ability to access causes a significant difference between people who access and people who do not (7,53**). Access is considered to be a series of actions that begins when a visitor views their first page from the server, and ends when the visitor leaves the site or remains idle beyond the idle-time limit. Ability is an important blocking factor, because once employees have accessed they will return as can be seen in figure 16. And the percentage of returning visitors is high.

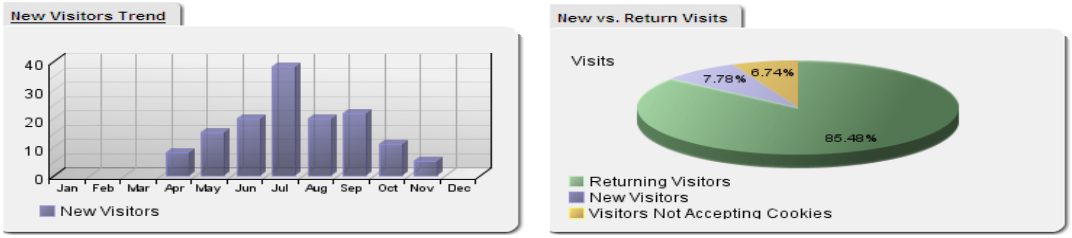


Figure 16, returning and new visitors.

Also in the open-ended part of the questionnaire respondents clearly indicated that the current way of accessing the EKC is preventing them from using the EKC. This counts especially for NMSC users who state that the TARS (Trust Anchored Repositories) log-in is not working as it is supposed to.

When accessing is causing problems, employees are less likely to use the EKC. Appendix V is showing some reactions from respondents.

The fact that respondents could not have accessed can be explained by respondents level of comfort with technology. Although asking questions about own comfort with is highly biased, it might be an explaining factor. Crosstabs showed us a significant relationship between accessing and level of comfort with IT 9,830 (with Sign of 0,020). This relationship is not very strong though (Cramer's V= 0,294). Another reason for the access to fail can be the speed of the EKC. This is proven wrong sice we found no significant relation between accessing the EKC and the speed of the EKC. The Levene's test was not significant (0,651) and also the T-test was not significant when equal variances were assumed. Speed is however related to the way employees perceive the information system quality (0,481**). This means that for returning users it must be kept in good condition. It is therefore good that the EKC administrators implemented ping-test and other measurement methods to keep track of the speed of the EKC. This test is called a N-to-N test. Outcomes of this test indicated that future growth is not a problem for the speed of the EKC.

When a closer look is given on the people who did not access, they also have no idea who to approach for access (65%). This can be caused by lack of commitment. It shows that there is a significant high correlation (0,497**) between ability to access and the commitment to the EKC. This lack of commitment is not caused by preferred substitutes of the EKC (Appendix W).

Language

Language is causing a significant difference (T-test: 6,57*)in the decision to access. People who do not access consider the language more problematic. We have asked whether the English language perceived to difficult or business jargon. Outcomes show that neither the people who did not access nor the people who do access consider English as problematic. The business language shows another outcome. The Leven's test gave an outcome of F=10,963 (Sig.=.01 < 0,05). Meaning that people who do not access consider the business jargon as difficult. Using the Cramer's V and Chi^2-test we found that there was a significant relation between people who do not access and business jargon when this is perceived to difficult. Although this relationship is quite weak (Cramer's V of 0,350). As can presumed, people with weak knowledge of English are also less able to access (-.351**), not enjoying sharing (-.280*) or feel confident about their own capabilities of sharing their knowledge (-.247*). The language barrier is causing problems to use the EKC because even the supporting documents are written in English. It is not surprisingly that there is also a negative correlation between language and the question whether useful manuals exist (-.291**). They also consider the sponsorship of the EKC from TME top management as less supportive. This can be explained as well by language since all communication from for example Jaczek is in English. Unfortunately, support from NMSC mangers was not significant to say if they can abolish the language barrier.

Trust

Trust is also showing that it influences the decision to access or not (F=12,58**). This difference in trust is based on the trust in management, members and the content on the EKC. When looking more into the differences of trust it is worth mentioning that people who did not access have even more trust in the information on the EKC then people who already accessed. Although this difference is not very big (2, 43 against 2, 67), it is remarkable and unexpected. Whether the differences in trust

are caused by lack of trust in other employees, management or the trust in information cannot be said though. And also trust itself is influenced by a lot of correlating factors. This can be explained by employees who withhold knowledge (Ardichvili, 2003) or see knowledge as an private asset (MC Lure and Faraj, 2000). But, as Ardichvili states, the most important barriers have nothing to do with trust or information hoarding, but more with the participant. The participants are namely more afraid that what they post is not important enough, or is not relevant. This is confirmed by some employees who indicate that reasons for not accessing or sharing is because they "do not know what actually should be shared on the EKC" (Respondent 84) or that they do not know what a best practice for the EKC should contain. Although there are regulations and forms for this (Appendix X), perhaps a closer attention can be given to this subject.

Commitment

As can be seen in the independent t-test, there is a significant negative relation between commitment and usage of the EKC(-6,18**). Users who do access (2,54) have a lower mean than users who do not access (3,33). This indicates that users are less committed then users who do not access at all. This is a very strange outcome. Wasko&Faraj (2005) found that: *"commitment has a weak but positive correlation with helpfulness of knowledge contribution but when reputation and centrality are taken into account, higher levels of commitment predict lower levels of helpfulness".* They have used further analysis which indicates that commitment is acting as a suppressor variable. We have tested as well if there is help available when access is a blocking factor. The availability of helpful documents is showing a significant difference for people who tried to access and people who access. The Levene's test showed F value of 4.335 (Sig.040). Employees who tried to access ((Mean) 2.89 SD .851) thought the help was better than people who could not get access, although they tried (mean 3.76 SD . 1,14). Lack of sufficient documents is not per definition a main blocking factor. Personal help can replace documents. "Finding time to help members on an individual basis, especially when it comes to the technological aspect of their participation, is significantly related to higher levels of satisfaction and success" (Bourhis, 2005). This help might be coming from the management because as many writers advocate (Wenger &Snyder, 2000), management needs to undertake actions that will alleviate obstructive effects.

Sponsor

To reach full potential of a community, senior executives need to provide sponsorship (McDermott, 2003). By doing so, the executives legitimize the sharing of knowledge and best practices in this community. In this case the sponsorship comes from the Sales Director Pawlak Jaczek. The t-test is showing a significant difference between employees who access and who do not (-3,00**). What is also showing is that the employees who do not access are more enthusiastic about TME sponsorship then people who do access. Apparently, users who access are judging the role of sponsors as less supportive. We also looked whether commitment is interfering in the relation between accessing and sponsorship since commitment is correlated with both variables. Sponsorship has a correlation with commitment of .453** and accessing of -.581**. When using a partial correlation analysis, it shows that the relation between Sponsorship and Accessing is not significant anymore (-0.79 & sig. .518) when the effect of commitment is tested on both variables. Apparently members are less relying on leadership in the decision to access when they are more motivated by themselves. Dubé *et al.* (2003) confirm this when saying that growth of a community comes with the feature that the role of leadership changes. The sponsorship is less influential in the decision to re-access, but more the

content and interaction around expertise. We can derive from this that the sponsor is important for beginning EKC members and the content and available expertise is more influential when users become more active.

Management

A variable which is not causing a significant difference but is worth mentioning is the Management of the EKC. As stated before, organizations have an important input in the emerging, supporting and sustaining of VCoP's, especially if they do not spontaneously emerge (Bourhis *et al*, 2005).The way the community is lead, is thereby crucial for the success of a community. Fontaine (2001) identified three leadership roles: the management team of the organization, the officially designated sponsor, and the VCoP's leader. The leadership role motivates the community members to collaborate (Probst *et al*, 2008). Respondents indicated they were glad about the way the EKC was lead. This is a good sign. This comes according to Bourhis *et al* (2005) because: "*the way the leadership team fulfills its obligations that seems to be more important than the mere fact of assigning roles, especially for communities facing obstructive conditions due to some negative structuring characteristics*" (Bourhis *et al*, 2005). We derive from this opinion that the reason why employees access is because of the content and the offered materials on the EKC. Another conclusion is that it is an indication that the EKC is mature.

6.4. Blocking factors Sharing on the EKC

Once usage of the EKC has been investigated, it is also good to have a look at people who share information and best practices and people who do not. The people sharing on the EKC are considered active and/or core group users while the remaining users are the peripheral users. Also for this model was first a multiple regression analysis. The R^2 gave a value of .622, meaning that 62% of these variable explain the outcome (Sig.0,012). We test in this chapter what causes the differences between users who share, and users who do not share.

The Newsletter

Just like in the last chapter, we were curious about the influence of the Newsletter. The Newsletter turned out to be a stimulus in the decision to access. It creates awareness and interest. Looking at the relation between the newsletter and decision to share on the EKC there can be seen no relation. With the Chi^2-test a significance of 0,855 was measured meaning that users show no is no stimulus to share on the EKC when the newsletter is send out (Sig.>0,05). The result is given in Appendix U. When looking at WebTrends it is also confirmed that the newsletter has no effect on sharing. Looking at the trend of documents uploaded, there can be seen no change when sending out the newsletter (Appendix T).

Sharing; yes or no?

In the questionnaire we compare two groups: The respondents who have shared and the respondents who did not. Again we first tested the Levene's Test for Equality. The outcomes show that Commitment gives a significant difference in the decision to share with Equal Variances Not Assumed (EVNA). The T-test with Equal Variances Assumed in the independent sample t-test shows that 'Self Efficacy', 'Codification', 'Sponsor', 'Enjoy', 'Lost of Knowledge Power' and 'Leadership' have a significant difference. Although due to privacy reasons we are not allowed to check how much people upload individually, we can check for differences in reasons to share or not. We have first tested if ability to upload might cause the difference.

Variable	People who Upload		People who did not share			
	Mean	(SD)	Mean	(SD)	T_{EVNA}	T_{EVA}
Self Efficacy	2.15	(0.46)	2,51	(0,45)		**-2,712****
Commitment	2,39	(0,70)	3,61	(0,35)	**13,35****	
Codification	3,47	(0,62)	3,01	(0,61)		**2,553***
Sponsor	2,59	(0,73)	3,61	(0,70)		**-2.514****
Enjoy	1,97	(0,59)	2,61	(0,64)		**3,531****
Language	4,64	(0,73)	4,25	(0,95)		1,659
Ability	2,98	(0,81)	3,21	(0,71)		2,49
Speed	2,51	(0,99)	2,31	(0,89)		0,796
Motivation	3,15	(0,89)	3,21	(0,62)		-3,303
Leadership	2,66	(0,97)	2,42	(0,65)		**1,102***
Is Quality	2,63	(0,63)	2,28	(0,63)		2,058
LossofKnowledgePower	1,58	(0,51)	2,23	(0,75)		**-3,237***
Trust	2,67	(0,32)	2,67	(0,51)		0,420

*=P<0,05 , **=P<0,01

Figure 17, Decisions to access

Ability to upload

Figure 17 shows us that that there is not a significant difference in the ability to upload (Sig.>0,05). This has implications for the EKC because it means that ability is not preventing employees to share. So there must other reasons why EKC members are not sharing. Finding these blocking factors and remove them is important because, as Davenport, De Long and Beers (1998) state: 'a successful VCoP needs to have a growing amount of knowledge content and usage'. For the EKC, the new –and returning users are looking promising. The content on the other hand is not. When we look closer on the document action, it is becoming visible that there are only a few documents responsible for most downloads (Appendix Z). Only these documents are responsible for most document actions (Appendix Y). This is not good for the continuity of the EKC because the success of a platform like the EKC requires that knowledge contributor are willing to share their knowledge (Ba *et al*, 2001). The EKC needs continuous input from employees, where the platform depends on the "Kindness of strangers"(Constant *et al.* 1996) to share the knowledge with each other.

Commitment

The F-value of the Levene's test is 13,35 (Sig. 0.001**). The employees who upload documents are more committed to the EKC then people who do not. This is confirmed by Wasko & Faraj (2000) who found that individuals who participate in an electronically network and have a strong sense of commitment are more likely to share knowledge and assist others. There is no link however between volume of contribution and commitment and surprisingly they found that sharing is not due to moral obligation or expectations of reciprocity from others. What Wasko & Faraj (2000) advice is employees get "a sense of responsibility to help others within the collective on the basis of shared membership". If the EKC management is able to create a platform where the norm is that employees help each other with problems, one of the results can be that employees get more committed. In fact, these factors enforce each other. If the EKC manage to create an environment whereby the committed users take the lead, they can help expanding the EKC with expertise. The EKC can

subsequently also expand to a form of leadership depending on interaction around expertise (Dubé *et al*, 2005).

Codification effort

When individuals are willing to share they need to codify their knowledge and share it via documents on the EKC, whether this knowledge is tacit or explicit. The T-test showed a significant difference (2,553*) between individuals who upload and who do not. Apparently employees who do not share consider codification more as a blocking factor. Due to the fact that only the combined factors gave a valid construct of codification effort, we cannot tell what causes the biggest blocking factor of codification. If employees do not have the time to enter knowledge on the EKC (Orlikowski, 1993) or whether it takes to much effort to codify the knowledge to documents for the EKC (Kankanhalli, 2005) cannot be said because these were not significant. The current process of handing in a best practice goes via a submission form which is supported by a manual as can be seen in Appendix X. Apparently this submission for cause's problems for submitting best practices. When taking the questions 'it is clear how the approval for submitting content works' is put in a cross tab with the question if employees ever submitted it shows that the process of submitting is not clear (N=55, Sig 0.003**). What can be seen as well is that loss of knowledge power is negatively correlated with codification effort (-.295*). Meaning that employees are not willing to codify their knowledge because they will lose knowledge power. This relationship is not very strong. What is important to know related to codification effort is also mention in chapter 6.3 " Trust". Despite factors as " Loss of Knowledge power" these factors are overshadowed by the fact that users are afraid that what they post is not important enough.

Loss of Knowledge Power

Employees who share, are less concerned about losing knowledge power. This might be also explained because members do not trust each other. When the degree of trust is present and the employee trust the organization and its members, they give up sole claim of the benefits stemming from the knowledge they posses (Kankanhalli, 2005). Loss of knowledge power is considered to be a blocking factor for knowledge sharing (Davenport and Prusak, 1998). They also write that the reason why employees may keep their knowledge is because they thing they will benefit more if they hoard knowledge over sharing. Meaning that they will remain lurkers instead of active members. Our research found an significant difference (-3,237*) just as Davenport and Prusak's (1998) found between people who share and people who do not share. So, for the EKC it still counts that users think they are giving up knowledge from which they think it gives them competitive advantage. Interesting for the EKC is that some of the users who share most, are highly placed in the hierarchy of Toyota. This because, as Kankanhalli (2005) found, loss of knowledge power is also party explainable by lack of pro-sharing norms. So perhaps when management motivates employees and established pro sharing norms, employees have care less about losing knowledge power. Pro sharing norms were not in the scope of this research, although other research indicates that Toyota has a pro-sharing culture (Dyer *et al*, 2000).

Self Efficacy

As stated before, self efficacy is the believe that members have that their knowledge can make a difference to the organization (Wasko & Faraj, 2000). Kankanhalli (2005) found that when people feel that they lack the knowledge to contribute, they might decline sharing their knowledge. This is

because they believe they are not contributing in a positive way. The knowledge contributors of the EKC are significant more confident about their own capabilities -2,712** then the employees who did not share their knowledge on the EKC. When looking at WebTrends it is also confirmed that the users who are the most active on the EKC are uploading more. Already, the 10 most active users are responsible for 42% of the traffic on the EKC according to WebTrends. These users meet the description of the core users. It is a small group, consisting of 10 to 15% of the total population. These people are actively participating on the EKC and are thereby the active heart of the community. It is possible that users do poses the knowledge from which the organization can benefit, but that they are not confident about their own capabilities. It might be good for the sponsor to mention that sharing as such is always good for the organization and that if a best practice is not considered good, it can always be filtered out but should not be withhold in the first place. This is indicated on the submission description (Appendix I), but apparently not widely spread yet. In fact, Wenger and Snyder (2002) state that it is specifically up to the executives to spread the word to share and give employees confidence that their knowledge will also benefit the organization. As can be seen in appendix R, there is a strong correlation between self efficacy and enjoyment in sharing of knowledge (0,557**), meaning that once the employees feel more confident, they also will enjoy more sharing on the EKC.

Enjoy

There is a significant difference in enjoyment of employees sharing their knowledge on the EKC (3,531**). Users who already shared content on the EKC clearly perceive more enjoyment of sharing their knowledge. This is related because they are more confident, as said by "self efficacy". On the way the questions were formulated, this is intrinsic enjoyment of the users. According to Davenport and Prusak (1998) is this intrinsic enjoyment based on the fact that the employees who share their knowledge have a desire to help others and feel good about this. It is however not measured if they feel good about this because it improves their professional status as Wasko & Faraj (2005) found for a reason. If extrinsic motivational factors will promote more enjoyment in sharing has not been researched neither, but this is rejected by Kankanhalli (2005) who did not find a relation between more sharing and organizational rewards (Adapted from Kalman, 1999). What can be seen is that employees who enjoy sharing are committed (.283*), have no problems uploading (.346*), are confident about themselves (.557*) and rate sponsor involvement higher (.330*).

Leadership

Probst *et al.* (2008) found that one of the 6 major success factors of a good community is the leadership of the community. Leaders can motivate community members to collaborate and share (Lesser and Everest, 2001). Our research shows a difference between the opinions in Leadership (1,102*, sig<0,05). Users who have shared appreciate the leadership more that users who do not. This might be because leaders can block input from other users. Because as Anderson (1996) say: 'before a new knowledge transfer can be successful in an organization and be managed in such a way, it is important to evaluate knowledge management activities and/or knowledge resources first'. Since the EKC is still evolving to a more mature VCoP, opinions can later change about leadership. This is because when a community is more mature, EKC members become more and more responsible for community leadership, because of expertise in certain areas (Wenger, 2002). It is important to indicate that the Leadership shows a significant relationship for sharing, something that it did not do for accessing. So, the leadership can promote sharing once the members are active.

Sponsor

Sponsors on the other hand influence the decision to access, as well as the decision to share. Andersen (1996) writes that Senior Management must perform a clear from of leadership. Users indicate a different opinion about the sponsors of the EKC though. Users who share on the EKC, rate the input of sponsors less high the users who never uploaded (-2.514**). This means that sponsorship functions in a positive way for employees who would like to access the EKC, but in a negative way for users who doubt to upload documents. They feel apparently not motivated by sponsors to share.

7. Discussion and Implications

Although the theories of virtual communities of practice (Fang & Chiu,2010), electronic knowledge repositories (Kankanhalli 2005), electronic communities of practice (Wasko & Faraj, 2000) and virtual knowledge sharing communities of practice (Ardichvili, 2003) are still limited (Probst *et al*, 2008), it has been viewed from several perspectives. Virtual communities have been researched from perspectives like the social exchange theory (Kankanhalli, Wasko & Faraj), the social capital theory and social cognitive theories (Chui *et al*, 2006). Most studies focus on how members can be motivated to share and reason why members are sharing. Other studies focus on retaining members (for example Fang and Chui, 2010). In other words, it has been researched what how employees can be motivated and encouraged to voluntarily add content to communities. Contrary to what other studies examined, this study focuses on what prevents members from sharing and what prevents them of joining in the first place. This has been indicated by Lee *et al.* (2006) that reasons for not sharing are diverse and complex and that there is less known about withdrawing then submitting. Reasons for withdrawing deserve more attention according to them. This study found out that the ability to access is an important blocking factor. But that next to that, also commitment, language and sponsors are influencing the decision to join. We make a distinction in user types and found that committed users are more willing to access and that language barriers might cause members to leave is no disclosure. We found that leadership has no significant relationship in the decision to access but this is contradicting for example with Bourhis *et al.* (2005) who found that especially the leader have an important impact on the VCoP's success. The discovered influence of the sponsor on the decision to access and share is found more often by intentionally formed VCoP's (Bourhis *et al.*,2005). Literature also states that tacit knowledge requires face-to-face contact between sender and recipient (Szulanski, 1996) due to tacit components of the knowledge. We have tested the relationship between codifiability of knowledge in relationship with distance, but found no significant relation for the decision to share. The variable Trust causes no significant relationship either. This is contradicted by literature (Fang & Shui, 2010). The difference in outcome might exist due to the fact that another definition of trust has been used. As several writers use different definitions of trust for sharing knowledge on VCoP's, the outcomes thereby can explain the differences. Kankanhalli (2005) for example uses generalized trust, Fang *et al* (2010) use trust in management and in members. We combine generalized trust and management, whereby trust in the knowledge of colleagues has been taken into account as well. This because trust in the knowledge coming from a sender has been identified as a reason of failure for knowledge transfer (Szulanski, 2006). Probst *et al* (2008) claim this due to rigidity of competences. Stating that: '*Members tend to primarily trust their own competences, and are therefore less willing to integrate practices originations from other members into their daily work'.* Our research shows that there is no significant difference though in the trust from people who share and who do not. What can be an explaining factor which can cause difference of trust in members who share and who do not is the criticalness of the information. According to Bhattacharya, Devinney and Pillutla, (1998) the degree of trust needed to transfer knowledge is depending on market value and bargaining power and the risk he or she takes for sharing the knowledge they posses. We found no relation though between trust and loss of knowledge power. Interesting to note is that this study shows that in the decision to access, the possible future difficulties for sharing are not taken into account. Variables who indicate sharing like: Loss of Knowledge Power, Codification Effort and Enjoyment in Sharing have no relationship whatsoever with accessing the EKC or not. The last group we invested was users who never joined the community at all. We did found any specific blocking factor for this group but they were overlapping

with factors other users experience as well. Users withhold possible useful knowledge because participants are afraid of what they post is not considered important enough or relevant. It important to clarify to users that lots of best practices are welcome because the EKC needs continuous input from employees and should not be blocked from sharing due to ambiguity of the demanded knowledge. There are namely already dozens of other factors blocking the sharing of knowledge.

Implications for Practice

The main purpose of this case study was to find an answer on how the Toyota Sales Division can improve the European Knowledge Center. The goal is to ensure a widely used platform of best practice sharing. Although improving the EKC is going to take time, there are improvements possible which can be realized by the EKC management on the short term. By solving some the blocking factors, the EKC shall become more effective. Sharing is thereby of great importance. Platforms like the EKC require that knowledge contributors are willing to share their knowledge (Ba *et al*, 2001). But also maintaining an active user group is required. The results from this provide suggestions for future actions and threats recommend for the EKC sponsors and community leaders. This chapter discusses the implications for the EKC on the basis of a Strength, Weakness, Opportunity and Treat analysis (SWOT) analysis, based on our model. Whereby advises are given for the EKC management to improve the EKC. The internal analysis (strong points and weak points) analyzes the parts which are possible to influence by EKC management. The external factors (opportunities and treats) are not changeable by EKC management but might influence the EKC. Most changes are possible to implement on the short term, some other will take more time because "changing the environment is a slow, difficult, and sometimes painful process that is more likely to take place in the long term" (Dubé, 2002).

Strengths

Newsletter

The EKC website informs the users via its newsletter. The newsletter has a positive effect on the usage of the EKC since the amount of log-in's always increases after the letter has been sent out. WebTrends shows that a reason for increase of log-in's is the newsletter. It creates awareness for certain highlighted best practices. Also the newsletter informs reminds users of the existence of the EKC and triggers them to have a look at the EKC again. The newsletter is also the channel which provides the sponsor (for the EKC that is Jaczek) to share his vision and news. This message reaches out all across Europe and even users from the United States and Australia reads it. Our research did not find however that the newsletter is also incites sharing of best practices via the EKC. A suggestion for top management can be that via the newsletter also sharing of best practices will be promoted. By laying the focus on "sharing is the way we work at Toyota" is a good way, because this is linking to the core values of Toyota (McDermott *et al.* 2001). Promoting knowledge sharing visually is important for creating a knowledge sharing culture (McDermott (2001). For Toyota the core message may lie in the fact that sharing contributes to continuous improvement and Kaizen of working methods. It can be promoted via the sharing culture of Toyota in the form of Yokoten.

Management and Sponsors

As just been indicated, the sponsors (Pawlak Jaczek) can spread around the message of promoting best practice sharing. This because our research found out that sponsors have a positive relation to employees and sharing of best practices. Next to that, the sponsor (Jaczek) is able to show the importance of the platform and top level recognition. The Sponsor appears to trigger users to start using the EKC, but is also important for motivating employees to share their knowledge. We did not found proof that the Management of the EKC can stimulate users to join, however we did find out that management appear to motivate users to share their knowledge. Users indicate that they think

the EKC management is dedicated and reliable and supportive when necessary. This is one of the 6 major success factors of a good community (Probst *et al.*, 2008). What is very important for the management is that in the ambition the let the EKC grow, new users will not be forgotten. For the positive or negative role of NMSC management to support EKC usage we did not find sufficient evidence. When the EKC will become more mature, the role of management shall change. Instead of controlling the entire EKC, it is advised that parts of the EKC are delegated to active users. Advanced users will propose suggestions for improvements or directions were to go to, and management can control the overall mission and strategy. A perfect example of this is the Nordic section where active users provide suggestions. Later sections as PPMD and Training should be having a strong voice in the way they lead that part of the EKC. What should be kept in mind is that new users accessing the EKC also need to see approval from Sponsors and get support to share via management. Again via the message of the sponsor new users should be triggered to participate and share on the EKC. The message is important to remain. Instead of a regular message of the top management, the message is sent out quarterly these days. Although a message seems innocent, it is a way for the senior executives to show their involvement. By doing so, the executives also keep track of the latest developments of the EKC (Probst *et al*, 2008).

Commitment

Communities like the EKC depend on a committed user base which keeps the community alive. The EKC has as an advantage that once users have accessed, they will return. This is an indication of commitment. Looking at the return rate of the users it shows that 85,5% of the users returns to the EKC. One of the reasons is, as a respondent writes: the EKC is supporting them in their day-to-day work. For the EKC , it is advisable to investigate what keeps these users coming back. The provided answers can perhaps contribute to an more valuable knowledge platform for users.

Weaknesses

Access

Responses from the EKC users indicate that they are not content with the way they have to access the EKC. This applies for NMSC users in particular. The NMSC users have to log in via TARs (Trust Anchored Repositories) whereby TME users can access via typing in the URL:// EKC or clicking on a link. It is therefore that the TME users do not consider access as a problem but NMSC users do. The login-name and code can be a problem because they expire and also the accessing itself is hard via TARs. To solve this, users request for a single sign-on for example all the Toyota extranet sites so they do not need to access on different (and difficult perceived) ways. When users want to have a quick solution or check and access is a problem, they will omit the site and so it is becoming a barrier preventing usage (Ardichvili, 2003). Although security of information must be guaranteed, they way the users currently have to access is holding them back.

Submitting best practices.

For submitting best practices, the IT is not indicated as a problem. Before users are wondering about that question how they have to upload documents they are more concerned about another question: What do they have to upload? Users have the impression that their knowledge is not important enough or is not considered relevant enough. Users indicate they do not know what should be shared or what a best practice should consist of. Ambiguity about what should be shared withdraws users from uploading. It is therefore that sponsors and management should highlight the importance of sharing. Thereby indicating that a best practice in employees' own work field can contribute to TME as such. Content can always be judged on value by coordinators after uploading. Lowering the threshold of sharing can improve the amount of sharing. Perhaps also electronic forms which can be uploaded directly after filling in with just a approval click from management might lower the barrier for submitting.

Codification effort

Electronic forms might also lower the effort to codify the knowledge into documents because it takes less time (Kankanhalli, 2005). User who do not share at this moment appear to have more problems with codifying their knowledge then users who already uploaded. One of the reasons for considering codification as more difficult is because knowledge sharing is considered as loss of knowledge power. A solution might be to promote sharing is by demanding users to upload regularly. McDermott (2001) advises that 'the sponsor should take on a supervisory and control function and demand of participants to complete at least on documented best practice per year".

Interaction

A last point of attention is the possibilities of interaction. Low level of interaction (or one-t-one interaction) is according to Probst (2008) one of the reasons a community might fail. The respondents of the study indicated that they would like to have new ways of interaction on the EKC. When they were asked to specify these ways of interaction they indicated the usage of "Blog Functions" and or "wiki" sub-sites on the EKC. Also Open forums were indicated highly and event calendars. The option for rating contribution was not considered very popular. Wiki and Blog functions were considered the most popular for interaction. With these ways on interaction, members can create new knowledge, generate ideas, reduce uncertainties test and discuss new suggestions.

Opportunities

Core Group

Despite the fact that the peripheral user group represents the majority of the community (Wenger, 2002) it is vital for a community to have an active core group. The active core group actively participate and direct the community to relevant topics (Wenger, 2002). The active core group can function as the basis for future growth. A good opportunity for future growth of the EKC can be guiding coalitions as they are named by Probst (2008). De EKC is already divided over sub-topics and section. With the implementation / integration of PPMD and Training more sections are joining. A good way to governance the EKC is appointing section leaders. These section leaders are responsible for judging the suggested best practices and are responsible for a section. They serve as control agents (Probst, 2008). With section leaders, it is possible to create more of a core group which can discuss more the direction of the EKC. This prevents the current leaders of the EKC of taking all the decisions themselves and thereby taking a lot of workload. The new role of the EKC management will become more of an overall controlling leader, discussing the direction of the EKC and take actions for improvements. The Nordic section is already proving this strategy. With the support of mister Fagerlund, a lot of new employees from Toyota Denmark joined the EKC and the Nordic section is becoming an active part of the EKC community.

Information System Quality

To improve the quality of the EKC, user who already participated indicated that the current search methods is not ideal. A Good working search function contributes to user-friendliness and functionality of the EKC. This is even more the case when the EKC expands and a lot of new content is added. Then a good search function improves the Usability (Lee *et al.* 2006). The search process for important documents can be reduced by highlighting top document. It reduces the amount of time to search for the best indicated best practices. Highlighting the best voted documents can be done in several ways: voting with + and – when an best practice has been read for usability. Then the highest rated documents can be published on the first site. Also the most viewed sections or downloads can be published on the introduction page. This makes it easy for EKC members to filter the best documents and makes it easy to search.

Treats

Peripheral users

Where having a leading core group for the EKC is a great opportunity, so is failure of realization of an more active core group a treat to the continuity of the EKC. It is recommended that this core group emerges in a beginning stage of a community and that it should remain stable after (Probst, 2008). For the EKC it is recommendable to create a core group with responsibilities per section which can enable growth of the EKC. We would not found evidence for face-to-face communication in this research since it was focused on document exchange, but having for example a yearly meeting with EKC core group people to discuss the strategy for the EKC is advisable.

Intra- and Extranet

Another possible threat for the EKC is the realization of a new intranet and extranet. With the new intra and extranet, the EKC might become less predominate in the introduction stage of these platforms. Sponsorship should also highlight the importance of the EKC in this stage to show top management support for the EKC and thereby its importance. It is therefore that the EKC should profile itself as the platform where best practices regarding business problems are discusses and posted. By making the EKC the platform for sharing this knowledge, it can even benefit from the new intra and extranet. With single sign-in for NMSC users, the threshold will be even lower for accessing the EKC because no log in via TARs is needed anymore.

Conclusion

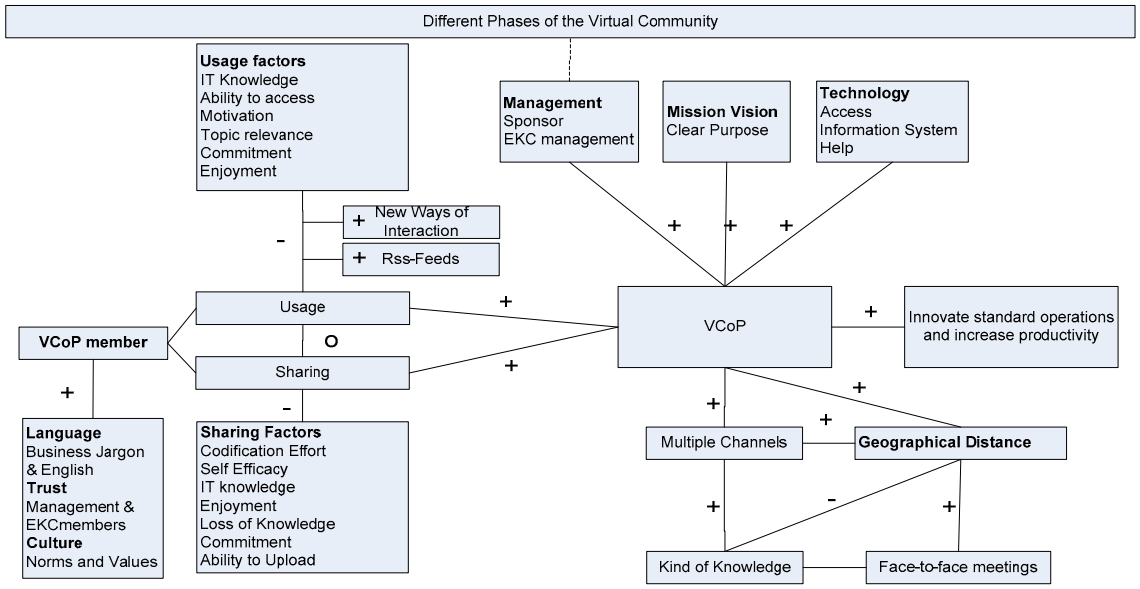
The main purpose of this research has been to investigate how the Toyota Sales Division can improve the European Knowledge Center, to ensure that the EKC becomes a widely used platform for best practice exchange. Although changes will take time, actions on the short term already have direct consequences for the community. We have identified that the way users have to access via TARs is preventing members to participate on the EKC. Members are hold back of sharing because it is not widely known what needs to be shared. If users are aware what to share, then codification effort is playing an important role. For the longer run, the EKC needs to pay attention on its core user group which role will change over time. The core users can lead certain sections of the EKC based on expertise. The role of the EKC management changes more into a controlling function. The sponsor will also fill in a more controlling function. In the ambition to grow, new entrants do not need to be forgotten. Sponsors face the task of indicating the importance of the EKC, while in the meantime they should promote sharing. In the promotion of sharing lies an important task for the EKC management, since they can influence EKC members to share. Whether improving the EKC causes other blocking factors in the future is unknown. This is a good suggestion for future research.

Further Research

For future research it might be interesting to see what variables are causing success and what variables are causing failure during different growth stages of a VCoP. In particular the role of management and sponsors during the growth stages of intentionally formed VCoP's are interesting to investigate. The focus should be on what managerial actions can be undertaken to prevent and counteract blocking factors. A model like the grow model of Greiner (1972) with his theory of growth phases in companies might be interesting to formulate for VCoP's. Longitudinal research would be a great opportunity to examine the changes in blocking factors.
Despite that fact that some really interesting outcomes appeared from this research, some area's were left untouched or deserve more attention for further research. Further research can question whether taking away certain blocking factors would motivate members to join actively or if in that case new blocking factors occur. Longitudinal research would be a great opportunity to examine the changes in blocking factors. And theses blocking factors that occur over time could perhaps function as the basics of a growth model for VCoP's as indicated in chapter 8. Another area for future research is the influence of VCoP's. This research was unable to find proof if a VCoP truly helps innovating standard operations or increases productivity. The EKC, just like the GKC operates with the assumption that when more members join and more content is shared it is a success. It is interesting to research whether a VCoP actually increases the operations of its members. The kind of knowledge transferred via VCoPs is researched in the area of E-learning. Lawson and Lorenz (1999) for example investigate the relationship between tacit knowledge and innovation of capacity in a el-earning environment. This is though in an environment without interaction. Interesting to see is perhaps if tacit knowledge is more easily transferrable when interaction takes place. The tacit knowledge is perhaps more easily to codify when videos of the process are attached. We propose the research model, as shown in figure 18 for future research.

Not related to this research included in the model is the influence of RSS-feeds. Rss-feeds are notifications that show up when something new is posted on a topic that the reader has indicated as interesting. Rss feeds allow users to stay updated with the latest content which they are interested in (IBM.com). For the EKC this can be helpful with the usage of IBM software which supports Lotus Notes for example. The Rss-feeds lower the threshold of information searching and keep the users more up to date. Further research might be interesting on whether Rss-feeds will make participants more active on VCoP's because members do not need to search a lot for new best practices but it will automatically keep members up-to-date. These RSS feeds can perhaps make the users more committed to the VCoP's and thereby perhaps make them more active as shown in this research.

An RSS feed can be considered as another channel for knowledge transfer or as an addition to a VCoP but it is good to research if the availability of multiple channels improves the sharing of knowledge. Or that it might lower the sharing because multiple systems are working next to each other. This is already the case for the EKC. Lotus Notes namely has the possibility to function as a VCoP, but these are not used. This might be explained due to the existence of the EKC.


Different Phases of the Virtual Community
Usage factors
IT Knowledge
Ability to access
Motivation
Topic relevance
Commitment
Enjoyment
Management
Sponsor
EKC management
Mission Vision
Clear Purpose
Technology
Access
Information System
Help
New Ways of Interaction
Rss-Feeds
Usage
VCoP member
Sharing
VCoP
Innovate standard operations and increase productivity
Language
Business Jargon & English
Trust
Management & EKCmembers
Culture
Norms and Values
Sharing Factors
Codification Effort
Self Efficacy
IT knowledge
Enjoyment
Loss of Knowledge
Commitment
Ability to Upload
Multiple Channels
Geographical Distance
Kind of Knowledge
Face-to-face meetings
Figure 18

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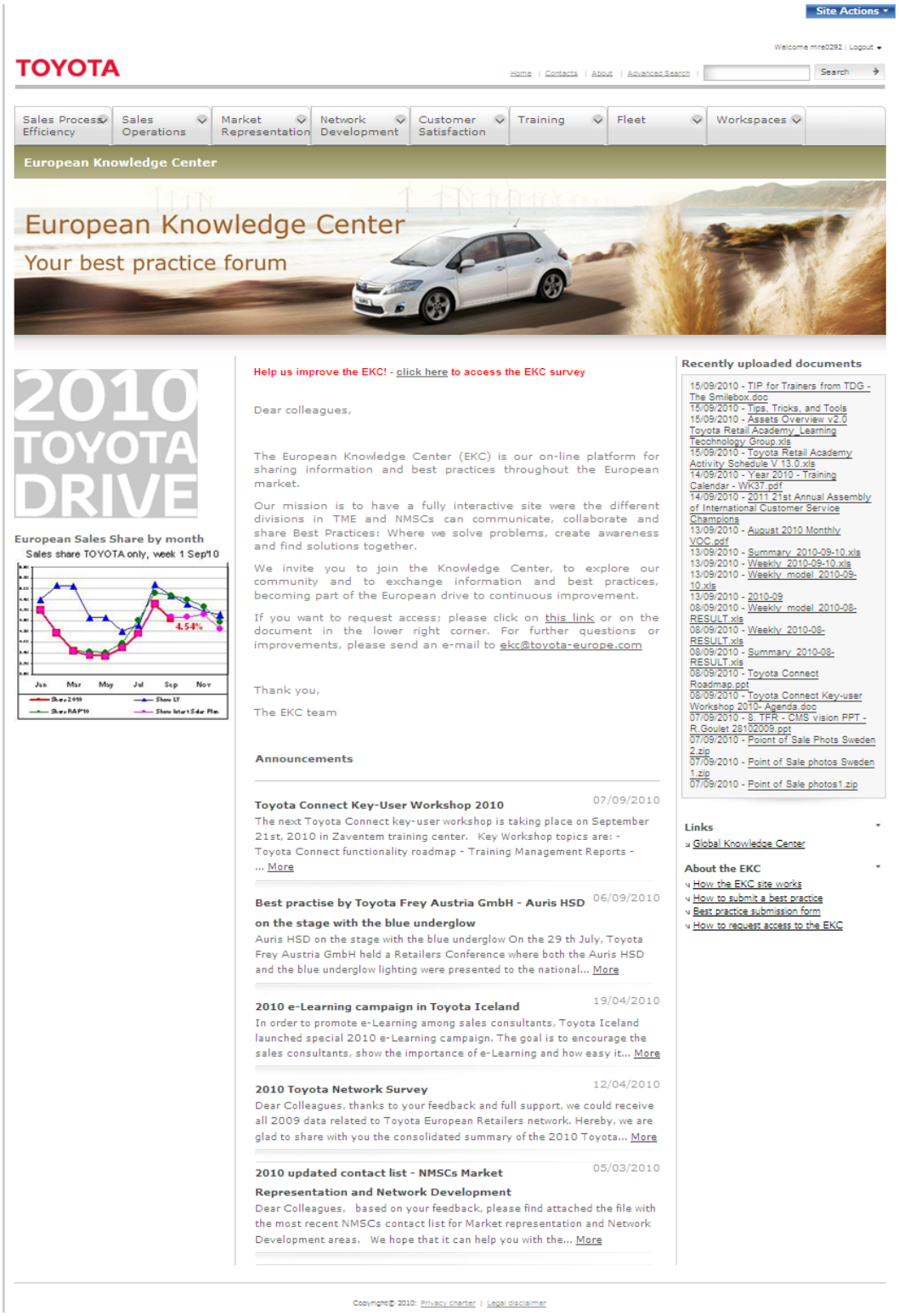
Appendixes:

The appendixes are number alphabetically. Directly under the appendix number is a short sentence describing the content.

Appendix AA

The EKC



Appendix A

The Toyota History

Sakichi Toyoda finished his first automatic loom, because he wanted to improve the loom that his mother was working with. His first loom was finished in 1897 and he kept improving it for three decades until he founded the Toyoda and Spinning and Weaving Company in 1918. The production produced on the principle that in case mistakes occurred, the looms stopped automatically. These principles resulted in Sakichi's manufacturing principles (Toyota EU):

- When irregularities occur, stop the operations automatically
- Never create defective products
- Do not make people constantly watch over machines

The principles resulted in a highly successful company. The company was producing an automatic loom called: "the non-stop shuttle change type Toyoda automatic Loom (Type G) that was so successful that the British textile company "Platt Brothers" bought the patent rights in 1929 for one million Yen. The transaction was supported by the Japanese government because they wanted to invest in military implications. This was because the Japanese Army was relying on foreign trucks and the government demanded a majority of stockholders from Japan and stopped nearly all import.

The Beginning Years

The money that was gained from the transaction was used for realizing an automobile department. This was founded because Sakichi Toyoda returned after a trip to the United States with the dream to start the first Japanese car manufacturer. After watching the industrial advantages Sakichi Toyoda turned to his son Kiichiro with the request to invest the money gained from the transaction with Platt Brothers into research for car manufacturing. After Kiichiro also returned from a trip to the United States they founded Toyoda Loom Works, Ltd. This department functioned under the principles that success only comes through watching, trail and errors also known as: Genchi Genbutsu.

The first production of cars, started in 1936, begins with the model A1 passenger car and the G1 truck. Both vehicles were based on the Chevrolet -65 horsepower straight-six, using the same gearbox and transmission combined with the styling of the Chrysler Airflow (Toyotageek). The sedan was mainly used by corporate executives, taxi drivers and for officials from the Japanese government. The G1 Truck was a truck with an overhead valve six-cylinder engine which was in accordance with a Chevrolet engine of that time.

Because the company wanted to have a name that was more easily to pronounce abroad, they decided to laugh a public contest to design a logo for the new sedan. The new logo featured the characters of Toyota, which was also adopted as the new name for the company because it sounded more crisper, clearer and is considered to be more luckier than Toyoda (Toyota Japan). According to Toyota was the Just-In-Time (JIT) principle also implemented during this period (1938).

Post-War History

During the Second World War, Toyota was producing trucks. Due to the fact that the engine was in accordance with the Chevrolet engines it was possible for the United States to use the captured trucks and replace them with interchangeable Chevrolet parts when they broke down.

After the Second World War, Toyota was given permission by Douglas MacArthur from the US government to start in December with the production of the BM and the SB-small trucks (GlobalSpec). In the year 1947 Toyota started again with producing a small car next to the production of trucks. This small car was not very powerful, put it was suitable for the destroyed roads in Japan.

The production was based on the American War Department industrial training programme and was the basis for what was further developed by Taiichi Ohno and is currently known as Kaizen and Lean Manufacturing.
The production resulted in a way of working and resulted in the 100,000th domestically car by the year 1947. The working ways were further developed and resulted in the so-called Toyota Production System (TPS).

Toyota Internationalizing

Taiichi Ohno formalized the Toyota Production System by developing a pull- production system and implementing Kanban. Kanban is concept that is designed to reduce lead times and inventory. The type of production changed as well because Toyota started to produce luxury cars as well. This started in 1955 when 1,5 litre four cylinder Crown Deluxe was introduced. This model was shortly followed-up by a 1 litre version called Toyopet Corona.

The Toyop*et al*so formed the basis for the international exploitation of cars when Toyota sold and licensed its first car in 1957 in America. When the model was first introduced along with the Land Cruiser, the cars were not selling very well. The reason was that the cars were not suitable for the American market and this decided the company to open its first plant outside Japan: in Brazil. The philosophy for this was that Toyota wanted to localize its production and designs of cars in order to adapt the cars to the places they are used as well as adapting the local production methods.

While producing the 1 millionth car world wide in 1963, Toyota was approached by Erla Auto Import A/S from Denmark with the request of exporting 400 Crown Models to Europe, thereby introducing Toyota to the European market. The first Toyota that was specifically design for another domestic market outside of Japan was introduced in the next year with the introduction of Toyota Tiara. The sales from this model started with 6,400 Toyota's in 1964 and went up to 300,000 cars a year in 1971.

Toyota Europe

While reaching over 1,000,000 annual domestic sales units in 1970, Toyota opened its Toyota Motor Corporation in Brussels. During these days the cooperation was also awarded for the first time with the Japanese Quality Award. The production increased further more and Toyota opened a vehicle assembly line in Portugal and a rally team was established which won its first victory in 1975. With the introduction of Lexus, coming over from the United States, Toyota Belgium slowly grew into the Head Office for Europe, with a training center and an office for creation. Currently has Europe 31 national marketing and sales companies which covers 48 European countries and a sales network of over 3300 outlets. Ten manufacturing plants are located in Europe and they provide work for more than 80,000 employees directly and through retail channels. Since 1990 over 7 billion euro is invested in Europe which has lead to a new design development centerin France and a new research and development centerin Europe. Furthermore, fourteen parts logistics centers and nine vehicle logistic centers are also located across Europe (Appendix A). Due to these investments, two-third of the Toyota cars sold in Europe are actually produced in Europe. As can be seen in Attachment B, currently 1,062,000 (2009) cars are sold in Europe.

Toyota in the Future

In the year 2010 the sales are expected to decline though. The economic crises and the dilemma with the sticking accelerator pedals caused that the sales are being inferior to previous years. In the first

month of 2010 though, Toyota sold 15,3 percent more cars than in the same period in 2009 (Elsevier, 2010). Whether this year will be successful or not, Toyota has its vision of how to cope with the future.

Already in the year 2002, Toyota revealed its global vision for the year 2010. This vision was based on the fact that mobility needs would have to be met in such a way that it is respecting the environment and the people. For 2020 to around 2030, four key themes are established:

- Toward a recycle-oriented society
- Toward the age of IT and ubiquitous networks
- Toward a mature society (the decline of nationalism and war)
- Toward motorization on a global scale (societies with little private transport gaining more)

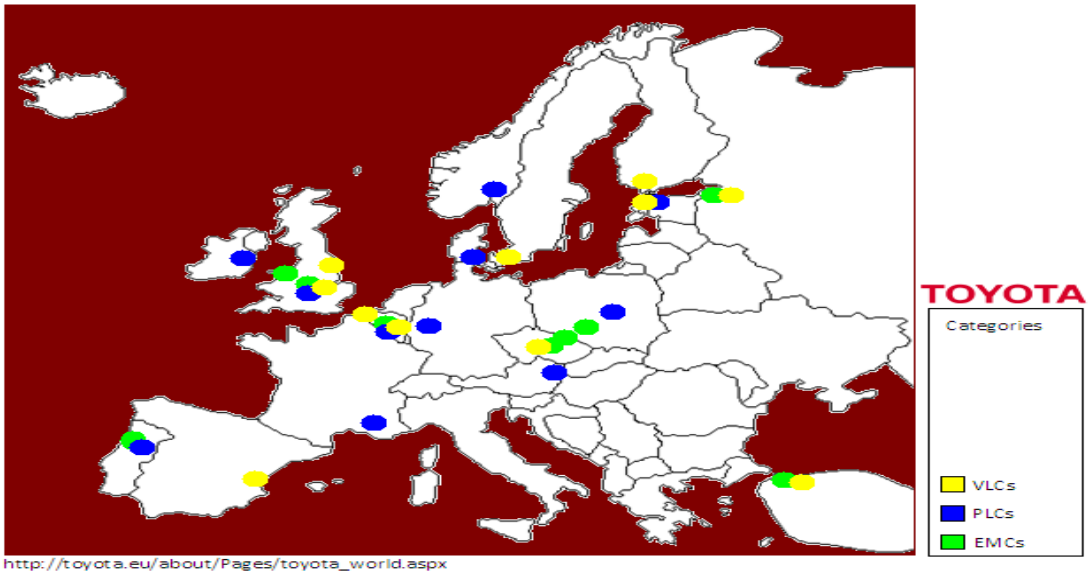
These key themes are linked to four key components to gain a new global image for Toyota:

- kind to the earth,
- comfort of life
- excitement for the world,
- respect for all people.

Working to a new global image is going to be realized from a customer point of view. Because the customers want high quality, affordable and attractive products, it is important to understand the wants and needs of the consumers.

In order to produce products that correspond with the changing demand and structure of the customers, Toyota wants to establish an efficient system of developing, producing and selling cars that can respond to the changes in the environment. The attention will be on pursuing cost management of compact and hybrid vehicles, combined with early commercialization of next generation environmental, energy economic and safety of the technologies.

Appendix B

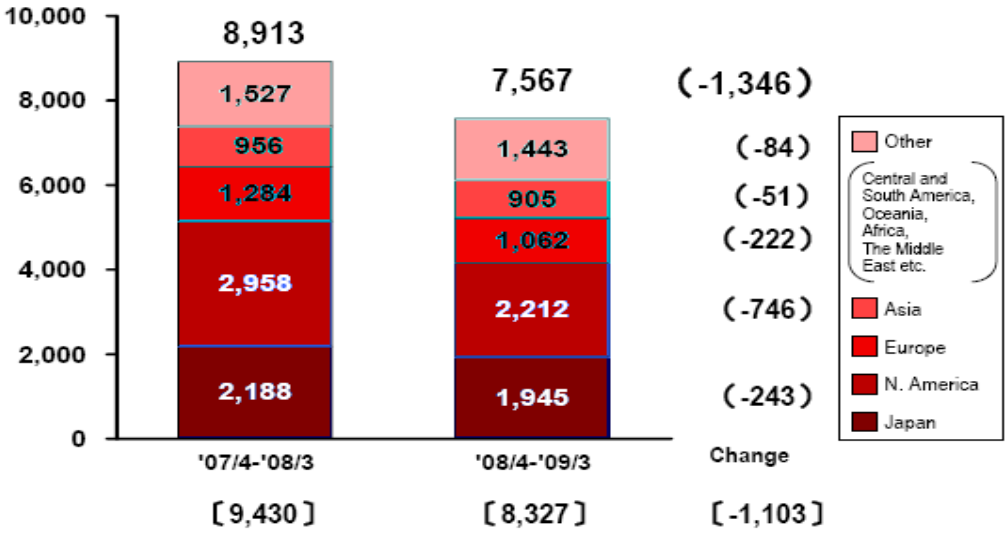


http://toyota.eu/about/Pages/toyota_world.aspx

Appendix C

TOYOTA Forecasts: Consolidated Vehicle Sales

(thousands of vehicles)



Appendix D

Epistemological & Ontological dimensions

There are different dimensions from which knowledge can be seen: the epistemological and the ontological dimension. Depending on the point of view, the whole outcome can be different. The epistemology view deals with: how we know whether or not a claim presented to us about the world is true or false. Questions related to the epistemological point of view are whether it is possible to neutrally observe and if it is possible to decide upon the truth by just observing facts. (McAuley, J. Duberley & Johnson, 2006). Epistemological objectivist shat that what you see is what there is. The subjectivist claim that what we perceive is influenced by our background. Truth and objectivity do not exist according to them.

The ontology view is different when questioning that: what exactly is the nature out there and what is the essence of the phenomena 'out there'? The ontological point of view deals with the question whether a phenomenon actually exist independently of our knowing and perceiving. And aren't we trying to create this social world when we try to know it? (McAuley *et al*, 2006).Just like the Organizational knowledge creation paper from Nonaka (1994), this paper follows the traditional epistemological view and thereby consider knowledge as true belief. As Nonaka also states, that it should be noted that:' While the arguments of traditional epistemology focus on 'truthfulness' as the essential attribute of knowledge, for present purpose it is important to consider knowledge as a personal 'belief,' and emphasize the importance of the 'justification' of knowledge.'

Appendix E

Tacit and Explicit Knowledge: the bicycle example.

When teaching a person how to ride a bicycle, explicit knowledge can be used to describe how to do certain actions: holding the handlebars, move the pedals etc. All single actions that can be described by a person (information) and be executed by another are explicit knowledge. All these individual actions do not help to ride the bicycle though. To ride, a person needs Tacit knowledge. When asking the drivers which way to turn the handlebars to prevent of falling to the right or to the left, most drivers will answer that they have no idea. They do know how to stay on a bicycle though. This means, that every driver who can drive a bicycle must, by definition, know how to turn the handlebars to prevent to fall off. This, because preventing from falling and stay on the bicycle, is part of knowing how to ride a bicycle. Tacit knowledge has a personal quality, which makes it hard to formalize and communicate. Tacit knowledge is deeply rooted in action, commitment and involvement in a specific context. In Polany's words, 'it indwells in a comprehensive cognizance of the human mind and body'. This is by Polanyi defined as 'knowing how'.

Appendix F

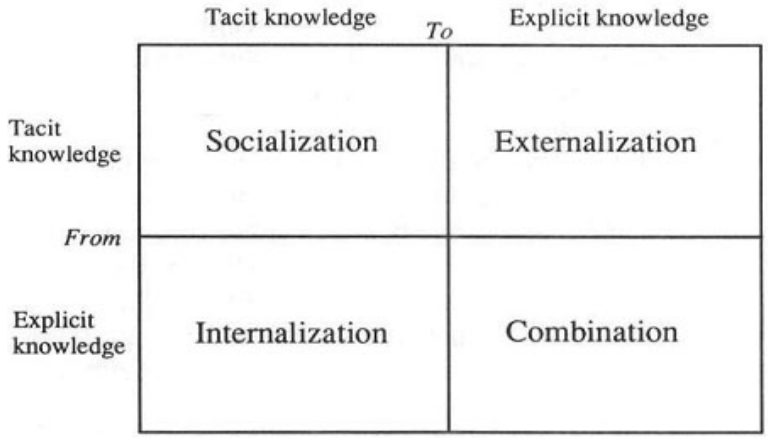
Sanchez's (2000) tacit knowledge transfers in a factory in Valenciennes, France

Toyota selected a core group of two to three hundred new employees and sent them to different exiting factories for several months. Because the transfer deals with individual tacit knowledge, the employees had to individually study and work on the assembly line in alongside experienced Toyota assembly workers. After return, some experienced assembly line workers came over to fine-tune the last difficulties. In this way, the superior knowledge inside the company was shared within the company. What is shown in this example, is that by learning from the other employees, the knowledge is transferred via tacit and explicit knowledge. By showing how to manufacture, tacit knowledge is transferred. By having instruction documents, explicit knowledge is transferred.

Appendix G

Tacit and Explicit Knowledge conversion?

Nonaka (1994) states with the following figure that it is possible to convert tacit knowledge and Explicit Knowledge:



Modes of Knowledge Creation (Nonaka, 1994)

The figure is about knowledge creation. But, in order to create the new knowledge for a person, it must be transferred from one to another. Nonaka describes for ways of transferring knowledge to create new knowledge. Transferring tacit knowledge through shared experience is called Socialization. When individuals exchange and combine knowledge through meetings, e-mails and telephone calls, Nonaka call this Combination. This is all transfer of the same kind of knowledge though.

Conversion takes place when Explicit turns into Tacit and Tacit turns into Explicit. The idea is that 'tacit and explicit knowledge are complementary and can expand over time through a process of mutual interaction '(Nonaka). Each of the four conversion modes can create knowledge independently according to Nonaka, but to create knowledge, the four modes must become a clockwise spiral. This is a clockwise spiral of dynamic interaction between the different modes which stand for organizational learning. It is a spiral because the learning of knowledge goes deeper and deeper for the ones involved. A fact is that Nonaka created the knowledge conversion modes with an eye on knowledge creation. The transfer of knowledge though, does not necessarily mean that new knowledge is created. There is discussion whether it is possible to convert tacit knowledge to explicit. Even Nonaka writes in his article that the concept of externalization is not well developed.

Cook and Brown (2001) state that tacit knowledge cannot be turned into explicit, nor can explicit knowledge be turned into tacit. According to them, explicit knowledge can be used as an aid to help acquire the tacit knowledge, but cannot by itself enable to let a person ride a bicycle. 'The tacit knowledge is necessary in being able to ride, but it does not by itself enable a rider to say which way to turn'. The recipient can read how to ride, but has to experience itself how to drive and can be managed/coached via interactions or imitate examples. Organizations are better understandable if tacit, individual, group and explicit knowledge are seen as coequal forms of knowledge. Thereby Cook and Brown state that knowledge is a tool of knowing. They borrowed this theory from the American Pragmatist philosophers and their epistemological perspective. They call what is possessed 'knowledge' and what is part of action 'knowing'. Knowledge and Knowing are in their theory not competing, 'but complementary and mutual enabling. When Cook and Brown applied this theory on the example of Polanyi and the bicycle they wrote the following:

'*To be able to ride a bicycle, one needs to have the (tacit) knowledge of how to stay upright. This is knowledge one possesses; it is not the activity of riding itself but knowledge used in riding (you still possess the tacit knowledge even when you are not riding). Possessing this tacit knowledge makes it*

possible to keep upright, which is something that the explicit knowledge of which way to turn cannot do'.

New knowledge for an apprentice, like riding the bicycle, is generated via interaction with the master's use of his or her existing knowledge. Cook and Brown see this process as an interaction with the social and physical world whereby the master's knowledge is used to generate knowledge for the apprentice. Other writers, like Nonaka define this as Knowledge transfer from the master to the apprentice. When the apprentice possesses the knowledge but also is able to perform the knowledge, Cook and Brown call this knowing. This means that when a person knows how to do something, he or she can transfer this knowledge as explicit knowledge or show how to do something and thereby show tacit knowledge to the apprentice.. The recipient will enrich his or her knowledge when applying the transferred knowledge and experience it in his or her own environment, combined with the prior knowledge he or she already has. So tacit and explicit knowledge should be seen separately, should be transferred differently, but they can strengthen and enrich one another.

Appendix H

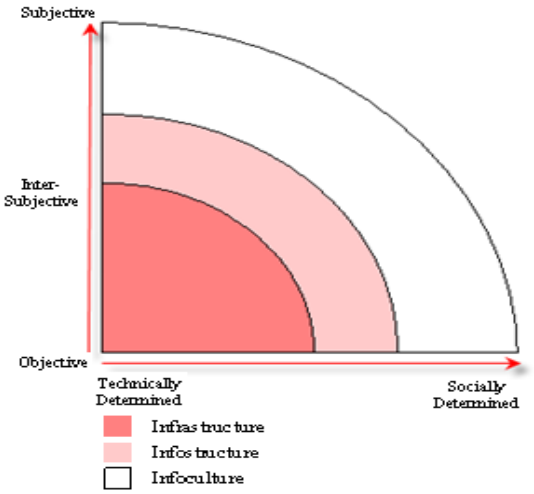
The socio-technological perspective

The socio-technological perspective looks at the exchange of knowledge from the point of technology whereby persons exchange knowledge with the usage of information technology. Many studies discuss knowledge management through an IT point of view. They look at the problem mainly as it is an IT problem to solve but there are also other perspectives. Walz *et al.* (1993, p.63) for example state that knowledge is the raw material of software design teams. Meaning that it is nice to have a knowledge platform, but it is about the knowledge that is transferred inside that makes or breaks the success of the platform. Without the flow of knowledge in the knowledge platform, the supporting platform is useless. It is unreasonable to state though that the knowledge and the platform must be seen completely separately. Viewing from the point that there is interaction between the social and technical factors, a whole new point of view is arises which is supported by a growing number of studies (Pan *et al*, 1999). According to Grant *et al.*(1997)is a redefinition of the relationship between the environment and technical subsystems required due to the adaption of new information technology. The redefinition will view the link between social and technical point of view through a socio-technical perspective. Meaning, that the organizations are made up of people that produce products or services using some technology and thereby effecting the operations and appropriateness of the technology as well as the actions of the people who operate and use it (Pasmore *et al*).

The Socio- Technical perspective can be divided into three layers of interaction. These layers are shown in figure x below. The layers are presented by Pan *et al.* 1998 and mean the following:

- Infrastructure (the hardware/software which enables the physical / communicational contact between network members.)
- Infostructure (the formal rules which govern the exchange between the actors on the network providing a set of cognitive resources whereby people make sense of events on the network)
- Infoculture (the stock of background knowledge which actors take for granted and which is embedded in the social relations surrounding work group processes.

The layers are constant interacting with each other, but in order to define the scope of the research it must be clear which layers to focus on. Keeping in mind that there is interaction with IT, but that the focus will be on the transfer of knowledge; the focus will be on info culture and info structure.



By excluding the infrastructure, we take for granted that the EKC is already enables the physical and communicational possibilities to generate contact between network members. It might turn out, that after researching this EKC is not the right tool for certain kinds of knowledge or information or that there are other limitations.

'Although the socio-technical system approach has its limitations, it is a potential powerful analytical tool, created by the management science of knowledge, which issues to valorizing tacit knowledge through a application of IT' (Pan *et al.*).

Appendix I

Phases of Knowledge Transfer

The transferring of the best practices can be divided into several faces, which occur in a certain order. Based on Szulanski(1996) a figure X is drawn. This model shows the phases of the intra-firm transferring process of the best practice knowledge. A further explanation will be given after the figure.

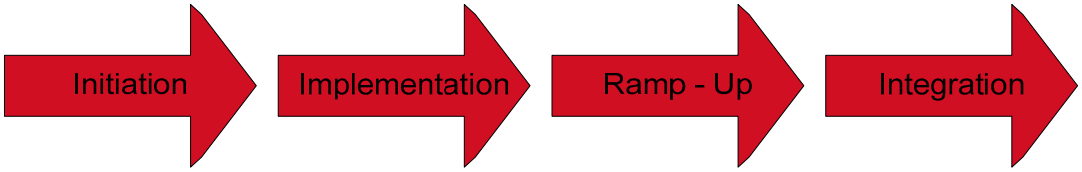


Figure X: Phases of intra-firm knowledge transfer

The Initiation phase is the beginning of the knowledge transfer process. It is the decision from the resource to transfer information. The sender thinks about the idea, whether it adds value for other users and starts coding the information. According to Teece (1976) it can takes months of collecting data, information and evaluation before the best practice transforms from an idea to a coding that is ready to be transferred.

The Implementation stage starts when the source decides to proceed (Szulanski, 1996). The recourses flow between the recipient and the source until the recipient starts using the knowledge. In this phase, The message goes from the sender to the recipient via transmission through the network. The network is an internal network of a multi-national company. During the sending of the message there must be made a distinction between tacit and explicit knowledge. According to Szulanski (1996), this face comes with 'transfer-specific' social ties between the source and the

recipient and the transferred practice is often adapted to suit the anticipated needs of the recipient. This means that there is intense communication contact between the source and the recipient. For transferring explicit information, this contact is not necessary.
The Ramp-up stage starts when the recipients start using the knowledge. Gupta *et al.* state that this step in the process is the step where the recipient decoded the information and used it for an assignment. In the beginning, the user might discover that the knowledge is used ineffectively (errors), but this improves after time (Bohn,1991, Szulanski, 1996).When the phase of successful using the information starts, we talk about integration.
In the Integration phase, the recipient is actually achieving satisfying results and starts working to routine ways of using the knowledge.

During all the phases and elements, there are chances of failure. In order to describe the phases where there is a chance for failure, first the definition for successful knowledge transfer will be given. This, because the ultimate goal is to have successful knowledge transfers.

Appendix J

Eventfulness per stage

If, in a knowledge transfer, no difficulties are experienced this is considered to be uneventful (Szulanksi, 1996). When difficulties appear during the transfer process, this is called eventful. Szulanski combined the eventfulness with the phases of knowledge transfer and come to the following problems that can arise per stage:

Initiation stage

- efforts to identify needs
- identify knowledge that meets those needs
- assess the feasibility of the transfer

Implementation

- bridge the communication gap between the source and the recipient
- adapting the practice to the recipient's needs

Ramp-up

- struggle to achieve satisfactory performance

Integration

- efforts to achieve routine use of the new knowledge in the recipient
- efforts to preserve routine use of the new knowledge in the recipient

Appendix K

Overview of Writers and the categories.

Author	Criteria that affect content exchange on VCoP	Key area
Mc Dermott	- *Personal challenge* - *Management challenge* - *Social challenge* - *Technical challenge*	People Strategy Culture Context
Davenport, De Long and Beers	- *Technical and organizational infrastructure* - *Standard, flexible knowledge structure* - *Knowledge-friendly culture* - *Clear purpose and language* - *Change in motivational practices*	Context Context Culture People People

	- *Multiple channels for knowledge transfer* - *Senior Management Support* - *Link to economic performance or industry value*	Context Strategy Strategy
Andersen (1996)	- Senior Management Support - Clear leadership - Evaluate knowledge management activities - Evaluate knowledge resources	Strategy Strategy Strategy Strategy
Szulanski	➢ Characteristics of the knowledge transferred ➢ Characteristics of the context ➢ Characteristics of the recipient of knowledge ➢ Characteristics of the source of knowledge	Knowledge Context People People
Burgelman, 1983; and Ghoshal	- Formal structure and systems - The sources involved in the process - The behavior-framing attributes of the organizational context	Context People Context
Sanchez (2003),	- Articulation - Evaluation - Application - Protecting knowledge assets.	People People Context Context
Holsapple, Joshi (Knowledge control management)	- Managerial influences - Coordination - Control - Measurement - Leadership - Resource Influences - Environmental influences	Strategy Strategy Strategy Strategy Strategy People Context
Kogut and Zander	- Language - Other forms of symbolic communication - Commonality of specialized knowledge - Shared meaning - Recognition of individual knowledge domains	People Context Culture Culture Strategy
McDermott & O'dell	- Practical business goals - Make visual artifacts - Set up core values	Culture Strategy Strategy
Kogut & Zander	- Relatedness - Technical core - Corporate culture - Individual motivation	Context Context Culture People
Dube	- Basics (lifespan age, maturity, orientation) - Organizational Context (environment, resource, leadership) - Composition (boundary crossing, cultural diversity) - Membership (size, geographic dispersion, membership stability, topics relevance to members, members prior community experience) - Technology (degree of reliance on ICT, members ICT literacy)	Context Context Culture People People, strategy
Ledford, Berge	- Individuals (hoard knowledge, resist collaboration) - Organizational culture (trust) - Ownership rights - Inappropriate skill level	People Culture People People

	- Top level leadership - Top down – bottom-up	Strategy Strategy
Gammelgaard, Ritter	- Duration of membership (long for VCoP) - Direction of communication (2-sided in VCoP) - The level of joint interest - Lack of physical proximity - Trust - Criticalness of information - National cultures - Institutional protection	Context Strategy People Context Culture/people Knowledge Culture Strategy
Na Ubon, Kimble	- Space and time constraints - Lack of Face-to-face interactions - Language - Cultural barriers - Trust - Low level of collaboration	Context Context People Culture Culture People
Correia, Paulos, Mesquia	- Intrinsic factors (Krogh and Grand 2002) - Extrinsic factors (Hall and Graham 2004) - Collaboration (Newell 2007) - Trust (Newell 2007) - Moral obligation (Ardichvili 2002) - Access to information and specialists (Wasko&Faraj 2000) - Organizational culture - Non-verbal communication (Kogut&Zander 2002) - Number of active members - Number of knowledge artifacts created	People Strategy Culture Culture People Context Culture Context Context Context
Ardichvili, Page, Wentling	- Members motivation to actively participate - Culture and climate - Facilitation of knowledge exchange - Social and technical attributes - Knowledge as a public good - Information Hoarding (knowledge as a private asset) - Earned the right (employees think what they say not imp) - Management	People Culture Context Strategy Culture People People Strategy
Szulanski	- Characteristics of the knowledge transferred (causal ambiguity, unproveness) - Characteristics of the source of knowledge (lack of motivation, not perceived reliable) - Characteristics of the recipient of knowledge (Lack of motivation, lack of absorptive capacity, lack of retentive capacity) - Characteristics of the context (barren organizational context, arduous relationship)	Knowledge People People Context
Gupta & Govindarajan	- Value of source unit's knowledge stock - Motivational disposition of the source - Existence and richness of transmission channels - Motivational disposition of the target unit - Absorptive capacity of the target unit	People People Context People People
Argote & Ingram	- Szulanski's 4 characteristics - Characteristics social networks - Characteristics of the task (similar number of elements)	---------- Context People

	- Characteristics of the technology or tools transferred	Context
Jensen, Szulanski Cross boarder transfers	- Stickiness (- Adaptation - Institutional distance - Recipient motivation - Causal ambiguity	Knowledge People Context People People

Appendix L

Difficulties of Sharing Tacit and Explicit Knowledge

The tacit knowledge is difficult to transfer because it is on the basis of specific experience, skills and attitudes, which are applied by the professionals on the daily basis. It is therefore difficult to transfer this knowledge. It is often said that to transfer tacit knowledge, face-to-face meetings are necessary to successfully transfer the knowledge. This to make the receiver familiar with the usage of the tacit knowledge in a certain context and surrounding. According to Nonaka, the perspectives of tacit knowledge remain personal until it is shared via social interaction. Information (or explicit knowledge) can be transferred via documents, e-mails and other forms of codified knowledge transfers and knowledge (or tacit knowledge) can only be transferred via face-to-face meetings, imitation, observation and practice. Import in the distinction between tacit and explicit knowledge is the question whether it is possible to turn tacit knowledge in explicit knowledge and the other way around in order to transfer the information and knowledge.

Factors influencing Sharing of Tacit Knowledge

Prior research shows that there are several factors which will affect the number of attempts to transfer knowledge and the outcomes of those attempts. Burgelman, 1983; and Ghoshal and Bartlett showed with their researches that the formal structure and systems, the behavior-framing attributes of the organizational context and the sources involved in the process all influence the transfer process. According to Szulanski (1996) it is not only the motivational part that blocks the knowledge sharing and reproduction of knowledge, but that it are the knowledge-related factors that form the major barriers to internal replication of the best practices that are blocking it. Al of mentioned above assumes that the process of the transferring and the implementation of the knowledge went without difficulty.

According to Szulanski, the “transfer of best practices” connotes the firm’s replication of an internal practice that is performed in a superior way in some part of the organization and is deemed to be superior to internal alternative practices and known alternatives outside the company. Best practices are considered to be tacit knowledge. The tacit component makes it difficult to transfer. But next to the transfer of the tacit knowledge, several other difficulties influence the transfer as well. According to Leonard-Barton (1990) and Szulanski (1996) four sets of factors are likely to influence the difficulty of knowledge transfer, which can be subdivided under the concept of “Stickiness”. ‘Stickiness connotes the difficulty of transferring knowledge within the organization’, Szulanski (1994). It is also known as ‘inert’ (Porter, 1994), or ‘difficult to imitate’ (Foss, Knudsen, and Montgomery, 1995). The theory of stickiness focuses especially on the usage of tacit knowledge. The following characteristics influence the tacit knowledge transfer:

Characteristics of the knowledge transferred (Causal Ambiguity, Unprovenness)

Characteristics of the context (Barren organizational context, arduous relationship)

Characteristics of the recipient of knowledge (Lack of motivation, lack of absorptive capacity, lack of retentive capacity)

Characteristics of the source of knowledge (Lack of Motivation, Not perceived as reliable)

Difficulties in Sharing Explicit Knowledge

Explicit knowledge has as an advantage that once an individual or Group articulates knowledge in documents, process descriptions, drawings and other forms of explicit knowledge, it is possible to distribute this quickly via information systems. The explicit knowledge can then be viewed from every part in the word. When the information is codified in such a way that it is understandable within the information, it is very easy to distribute. 'When distributed, the knowledge can be discussed, debated, tested further, and improved and thereby stimulating important organizational learning' (Sanchez, 2003) Making explicit information visible in documents also makes the organizations knowledge more visible, so that the organization can see what kind of knowledge it possesses.

A disadvantage of explicit knowledge is that once the information is visually available, it makes that it is also easier to understand for competition. Therefore it is really important to protect the vital information. Also individual employees must make sure not to lose this information and not to take it with them when changing jobs. Next to protection of the knowledge, other challenges threaten the explicit knowledge transfer. According to Sanchez (2003), these are:

Articulation

Individuals may not have sufficient skills or motivation to articulate their useful knowledge. They might also refuse to if for example they think their job is at stake when sharing everything. Compared to tacit knowledge, this can be shared under characteristics of the source of knowledge.

Evaluation

Individuals with different backgrounds, education, and organizational roles may have varying sets of knowledge, with resulting differences in their deeply held ideas about the most effective way to get something done. This can be shared under characteristics of the recipient.

Application

Ensure that knowledge articulated in one part of the organization is not rejected or ignored by other parts of the organization simply because they prefer to stay close to their own familiar knowledge base. Trust is here important. The application deals with characteristics of the knowledge transferred and the organizational context.

Protecting knowledge assets.

Due to the fact that the knowledge is literally available in documents, it is important to protect those documents from getting out of the organization. The same counts for protecting online databases from the external environment.

The internal factors above are factors that can be controlled and managed within the firm. It is also possible that external factors influence knowledge transfers. It is therefore important to take into account the environmental influences (Holsapple and Joshi, 2000). External factors that influence the sharing of knowledge externally are considered by the authors as:

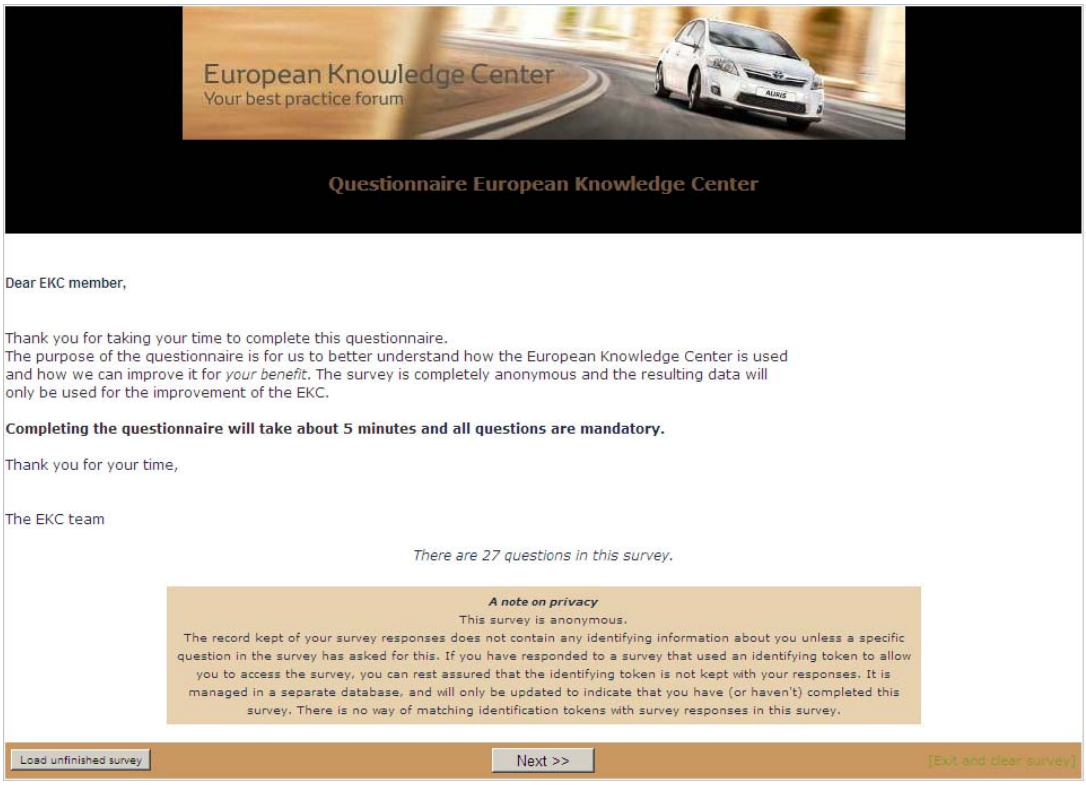
Competition
Fashion
Markets
Technology
Time
GEPSE: (Governmental, Economical, Political, Social, Educational)

Although organizations have very little control over these factors, they do influence sharing.

In order to manage the tacit and explicit knowledge transfers, they are important to think of.

Appendix M

Introduction page questionnaire.



Appendix N

Final text after finishing questionnaire

Dear Toyota Member,

Thank you very much for filling in this questionnaire. It will provide us a better understanding on how the European Knowledge Center is used and how we can improve it for *your benefit*.

For Accessing the EKC, please go to the following URL:

NMSC users:
https://ekc.toyota-europe.com/
And Login with your TARS username and password

TME users:
type in: 'ekc' in your URL browser

Yours faithfully,

The EKC team.

Appendix O

Cronbach's Aplha per Construct

Construct	Number of Questions	Cronbach's Alpha	Standard dev. &average
Geographical Distance	2	Not usable	Not usable
Self Efficacy	3	0.684	2.45(.035)
Commitment	3	0.53	2.76(0.94)
Codification effort	2	0.701	1.665 (0.352)
Leadership / Motivation of Management	3	0.733	2.74(0.340)
Sponsorship / Guidance of management	3	0.679	2.79(0.42)
Enjoyment	2	0.599	2.434 (0.234)
Trust	3	0.638	2.78 (0.767)
Loss of knowledge power	2	0.768	2.88 (0.080)
Ability			
-to access	3	0.855	1.775(0.137)
-to upload	3	0.745	3.139 (0.020)
-speed	3	0.834	2.286(0.048)
Culture	3	0.763	1.991(0.008)
Topic's relevance	5	0.798	2.509 (0.060)
Language	2	0.97	4.224(0.004)
Information System Quality	4	0.814	2.422(0.080)
Motivation	2	0.656	3.203(0.005)
Help	2	0.723	3.114(0.020)
Dependent Variable (Innovate standards)	3	0.600	2.661(0.091)
Dependent Variable II (Usage & Sharing)	2	0.956	2.343 (1,657)

Appendix P

Proof of insignificance dependent variable.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,727[a]	,529	,239	,62627

ANOVAb

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11,454	16	,716	1,825	,084[a]
	Residual	10,197	26	,392		
	Total	21,651	42			

Appendix Q

Figure X.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,814[a]	,663	,411	,328

The table is showing that the determination coefficient R^2 shows that over 66% of the variation in sharing and accessing is explained by the independent variables. We also used the ANOVA table with the variance analysis. With that we tested if the whole model is significant.

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,090	18	,283	2,626	,014[a]
	Residual	2,584	24	,108		
	Total	7,674	42			

With a F-value of 2,262, this model is significant (Sign < 0,05).

Appendix R

Correlations Variables.

Correlations

		SelfEfficacy	Commitment	Codification	Sponsor TMEManagement	Sponsor NMSC	Enjoy	Language	Ability	Topic Relevance	Speed	Abilityto Upload	Dependent	ISQuality	Motivation	Leadership	LostofKnow Pow
SelfEfficacy	Pearson Correlation	1,000	,300*	-,222	,110	,128	,557**	-,247*	,166	,103	,141	,322*	,381**	,094	,084	,163	,118
	Sig. (2-tailed)		,011	,065	,377	,407	,000	,036	,164	,456	,274	,017	,001	,496	,543	,257	,326
	N	72,000	72	70	67	44	72	72	72	55	62	55	71	55	55	50	71
Commitment	Pearson Correlation	,300*	1,000	,023	,453**	,322*	,283*	-,325**	,497**	,009	,076	,444**	,259*	,170	-,071	,189	-,155
	Sig. (2-tailed)	,011		,842	,000	,033	,013	,004	,000	,948	,556	,001	,024	,215	,607	,189	,181
	N	72	77,000	75	71	44	77	75	75	55	63	55	76	55	55	50	76
Codification	Pearson Correlation	-,222	,023	1,000	-,060	,204	-,117	,072	-,026	,162	,066	,154	-,197	,163	-,175	,052	-,295*
	Sig. (2-tailed)	,065	,842		,622	,183	,317	,544	,826	,236	,608	,263	,091	,235	,201	,722	,010
	N	70	75	75,000	70	44	75	73	73	55	63	55	75	55	55	50	75
Sponsor TMEManagement	Pearson Correlation	,110	,453**	-,060	1,000	,498**	,159	-,296*	,386**	,119	,155	-,084	,069	,223	-,220	,369**	-,064
	Sig. (2-tailed)	,377	,000	,622		,000	,186	,013	,001	,402	,217	,560	,565	,112	,118	,005	,591
	N	67	71	70	77,000	49	71	70	76	52	65	51	72	52	52	56	72
SponsorNMSC	Pearson Correlation	,128	,322*	,204	,498**	1,000	,330*	-,088	,126	,017	,140	,046	,090	,224	-,314*	,275	-,103
	Sig. (2-tailed)	,407	,033	,183	,000		,028	,570	,387	,910	,337	,769	,559	,144	,038	,058	,507
	N	44	44	44	49	49,000	44	44	49	44	49	44	44	44	44	48	44
Enjoy	Pearson Correlation	,557**	,283*	-,117	,159	,330*	1,000	-,280*	-,023	,031	,095	,346**	,450**	-,041	,074	,171	,037
	Sig. (2-tailed)	,000	,013	,317	,186	,028		,015	,847	,823	,460	,010	,000	,765	,593	,235	,751
	N	72	77	75	71	44	77,000	75	75	55	63	55	76	55	55	50	76
Language	Pearson Correlation	-,247*	-,325**	,072	-,296*	-,088	-,280*	1,000	-,351**	-,138	,028	-,134	-,121	-,052	,127	-,038	-,001
	Sig. (2-tailed)	,036	,004	,544	,013	,570	,015		,001	,277	,815	,331	,292	,684	,336	,789	,991
	N	72	75	73	70	44	75	85,000	84	64	72	55	78	64	59	51	75
Ability	Pearson Correlation	,166	,497**	-,026	,386**	,126	-,023	-,351**	1,000	,239	,165	-,031	-,088	,377**	,132	,043	-,230*
	Sig. (2-tailed)	,164	,000	,826	,001	,387	,847	,001		,057	,143	,820	,444	,002	,319	,754	,047
	N	72	75	73	70	49	75	84	93,000	64	80	55	78	65	59	56	75
TopicRelevance	Pearson Correlation	,103	,009	,162	,119	,017	,031	-,138	,239	1,000	,226	,320*	,194	,260*	,340**	,309*	-,043
	Sig. (2-tailed)	,456	,948	,236	,402	,910	,823	,277	,057		,072	,017	,140	,038	,008	,027	,752
	N	55	55	55	52	44	55	64	64	64,000	64	55	59	64	59	51	56
Speed	Pearson Correlation	,141	,076	,066	,155	,140	,095	,028	,165	,226	1,000	-,009	,094	,481**	-,140	,404**	-,255*
	Sig. (2-tailed)	,274	,556	,608	,217	,337	,460	,815	,143	,072		,949	,448	,000	,290	,002	,042
	N	62	63	63	65	49	63	72	80	64	80,000	55	67	65	59	56	64
AbilitytoUpload	Pearson Correlation	,322*	,444**	,154	-,084	,046	,346**	-,134	-,031	,320*	-,009	1,000	,301*	,043	,147	,277	-,054
	Sig. (2-tailed)	,017	,001	,263	,560	,769	,010	,331	,820	,017	,949		,026	,758	,286	,051	,696
	N	55	55	55	51	44	55	55	55	55	55	55,000	55	55	55	50	55
Dependent	Pearson Correlation	,381**	,259*	-,197	,069	,090	,450**	-,121	-,088	,194	,094	,301*	1,000	,080	,260*	,118	,221
	Sig. (2-tailed)	,001	,024	,091	,565	,559	,000	,292	,444	,140	,448	,026		,547	,046	,408	,053
	N	71	76	75	72	44	76	78	78	59	67	55	80,000	59	59	51	77
ISQuality	Pearson Correlation	,094	,170	,163	,223	,224	-,041	-,052	,377**	,260*	,481**	,043	,080	1,000	-,037	,416**	-,198
	Sig. (2-tailed)	,496	,215	,235	,112	,144	,765	,684	,002	,038	,000	,758	,547		,778	,002	,144
	N	55	55	55	52	44	55	64	65	64	65	55	59	65,000	59	51	56
Motivation	Pearson Correlation	,084	-,071	-,175	-,220	-,314*	,074	,127	,132	,340**	-,140	,147	,260*	-,037	1,000	-,169	,199
	Sig. (2-tailed)	,543	,607	,201	,118	,038	,593	,336	,319	,008	,290	,286	,046	,778		,235	,142
	N	55	55	55	52	44	55	59	59	59	59	55	59	59	59,000	51	56
Leadership	Pearson Correlation	,163	,189	,052	,369**	,275	,171	-,038	,043	,309*	,404**	,277	,118	,416**	-,169	1,000	-,187
	Sig. (2-tailed)	,257	,189	,722	,005	,058	,235	,789	,754	,027	,002	,051	,408	,002	,235		,188
	N	50	50	50	56	48	50	51	56	51	56	50	51	51	51	56,000	51
LostofKnowPow	Pearson Correlation	,118	-,155	-,295*	-,064	-,103	,037	-,001	-,230*	-,043	-,255*	-,054	,221	-,198	,199	-,187	1,000
	Sig. (2-tailed)	,326	,181	,010	,591	,507	,751	,991	,047	,752	,042	,696	,053	,144	,142	,188	
	N	71	76	75	72	44	76	75	75	56	64	55	77	56	56	51	78,000

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix S

Threats to Validity: Construct, Internal, External and Statistical Conclusion Validity.

Internal validity

Internal validity is "the validity of inferences about whether the observed co-variation between the treatment and outcome reflects a causal relationship" (Shadish *et al.*, 2001). For this research attrition of respondents causes bias due to loss of respondents. The loss of respondents is correlated with the conditions of usage of the EKC because both are it related. Even so, the way the questionnaire is distributed causes bias. The respondents were asked to participate via e-mail, newsletter and on the website. But if respondents consequently remove messages from the EKC before reading or when they are not in the (up-to-date) list of EKC members, their motivation reasons to join or not join are excluded from the research.

External validity

External validity is the validity of whether "cause and effect relationship holds over variation in persons, settings, treatments and measurements"(Shadish *et al.*, 2001). The generalizability of the research might be limited. This because the research is a case study held at one company. As Dubé *et al.* (2003) stated that when having a closer look at organizations, the communities share some common characteristics but they also have very different basic identities. This can be different from the amount of face-to-face contact, whether or not the community is spread over countries or in what stage the community is. The EKC is over the launching stage of the intentionally formed community, but it is not a full grown community yet. Therefore this study is limited to generalize because other communities will have to face the same characteristics and the same stage to take benefit from this study. It might be that beginning communities can take lessons of this research as well. Furthermore the interaction of causal relationships with units might not be very generalizable because the Toyota sales department was the unit of analysis. When more manufacturing personnel was researched, perhaps other blocking factors would have occurred. For example codification effort of manufacturing processes could have been more difficult to codify and therefore it would have been a bigger blocking factor. This also counts for VCoP's which are in the same country, because this change of causal relationship with settings might causes other blocking factors like language barriers and lack of face-to-face meetings to disappear.

Construct validity

Construct validity treats the "reasons why inferences about the constructs that characterize study operations may be incorrect"(Shadish *et al.*, 2001). After the pre-tests some questions were different formulated than the original literature. The construct however were directly taken from literature to increase validity. What might be a treat to validity is construct confounding due to the fact that a lot of constructs were measured it can result in incomplete construct inferences with the outcome of the model.

There is however one construct which must be dealt with caution: Trust. Throughout literature there are broad definitions of trust and how trust is measured in (empirical) scientific research. Kankanhalli (2005) for example comes with the definition of generalized trust, whereby they only measure from the perspective of other people in the organization. Fang and Chui (2010) on the other hand measure trust as trust in management and trust in members and not taking in account the content on VCoP's. We have decided to choose the content, management and members but with keeping in mind that other factors might be possible antecedents for trust or have a correlation with trust. Examples are

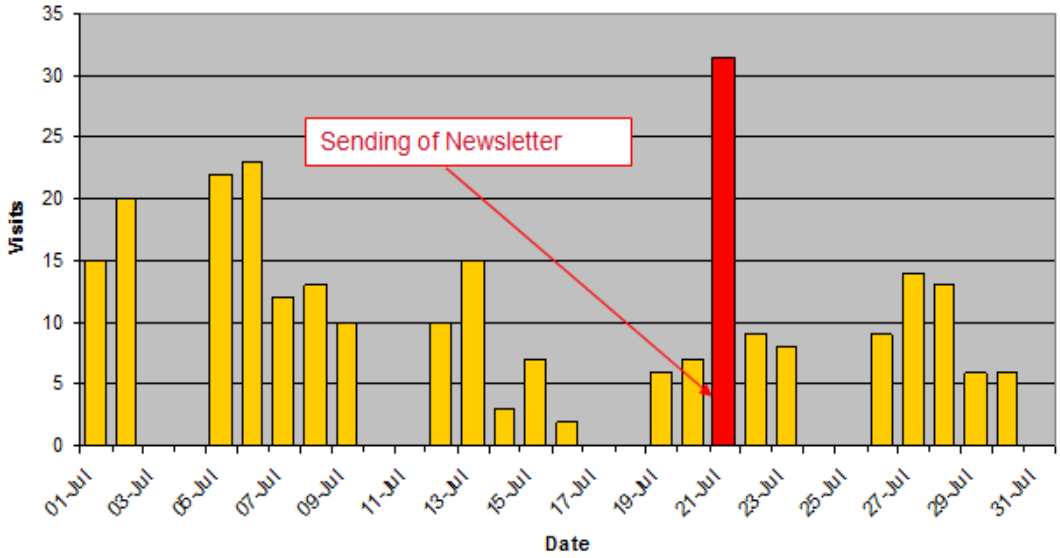
risk (Fang *et al*, 2010) intimacy between members (Probst *et al*, 2008) and a risk free environment (McDermott, 2002)

Statistical conclusion validity

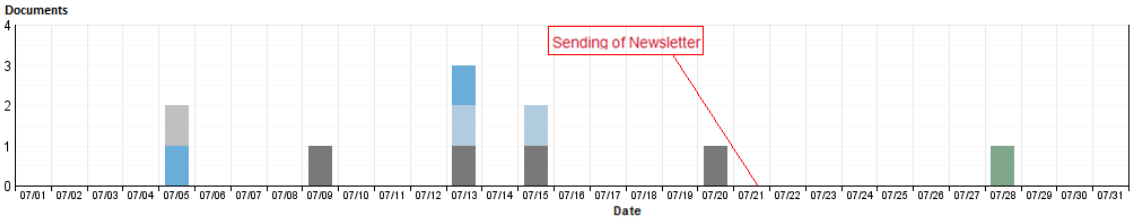
Statistical conclusion validity treats the inferences about the correlation (co-variation) between treatment and outcome."(Shadish *et al.*, 2001). With the help of the statistical techniques of De Vocht *et al.* (2008) is prevented that statistical failures were made. Also the help of statistical experts helped choosing the right methodologies.

Appendix T

Traffic peak when sending out newsletter



No Document peak when sending out newsletter



Appendix U

Newsletter effect on sharing

Chi-Square Tests

		Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square		.313[a]	2	,855
			Value	Approx. Sig.
Nominal by Nominal	Phi		,062	,855
	Cramer's V		,062	,855

a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 3,21.

Appendix V

Reactions from respondents about accessing the EKC

That access is considered a problem can also be seen from reactions in the questionnaire:

User 18 (Never accessed, but tried):

"Since long time we cannot manage my stable access to EKC. Our request is to make quick countermeasures to solve the access problems".

User 40 (Never accessed, did not try):

"integration in local tools (single sign on) instead of complex access control".

User 20 (Never accessed, did not try):

"Free Access would be fine. Not enough time in daily business to have a look at EKC. INTERNET Access like GKC would be helpful".

Appendix W

Substitutes.

To test whether people who do not access the EKC prefer other substitutes to share best practices and information we have tested what other methods of getting and sharing content they use. Via Cross tabs we checked whether there was a significant relation between accessing the EKC and content and best practice sharing via: e-mail, near colleagues, internet, extranet and other sources of help. There was no significant relationship between requesting via e-mail (,024)and usage of the extranet (,040). The relationships where however week with values of 0,253 and 0,229. Actually, the outcome was that users prefer the EKC for offering information and knowledge instead of sending it via email or other sources

Appendix X

Submission rules and form for best practices

TOYOTA

How to submit a Best Practice

We rely on you to keep the EKC site alive with great new ideas.

What is a Best Practice? A case study, a template or tool, a sales campaign, retailer presentation, basically anything that has proven to lead to a targeted result in customer satisfaction, retail efficiency, cost savings, market share improvement, and/or revenue generation. Please don't worry if it is a good practice or a best practice, your colleagues will decide for themselves. But do include any results or retailer feedback.

Format: Please use the document called "Toyota EKC Best Practice Submission Form" (available in the download section) to provide an overview in English. Filling in this information will help us tag your good idea for our search engine and provide important information for your NMSC colleagues, especially if the supporting documents are in another language. Be sure to provide a local contact person with details so if another NMSC needs more information he/she will know who to contact.

Your Best Practice or good idea can be sent as a .doc, .xls, or .ppt and no one file may not exceed 15Mb. The Market Representation team has kindly asked that you use the "Market Rep Best Practice Sharing Template" for your supporting documents.

You may submit a .pdf but please remember that we would like for other NMSCs to reuse your good ideas especially if it is a tool, template or presentation.

Your Best Practice and the submission form can be submitted to: EKC@Toyota-Europe.com and it will be forwarded to the relevant business area for review. It is up to the business management of that team to evaluate and post on-line but we will do our best to keep you informed.

Evaluation criteria can include: successful results; readability; usability; clear objectives; identified process; timelines respected; resources and costs involved.
SRG 08.07.09

Toyota EKC Best Practice submission form

Please mail this form, along with any related documents to: EKC@toyota-europe.com

NMSC Name: Date of submission:
Submitter's name: Job title:

Summary description:

Date of implementation: Related functional area (select one): Related business area

Why developed (problem description):

Challenges in implementation:

Results obtained:

Lessons learnt:

Documents relating to this Best Practice (full name of document and author):

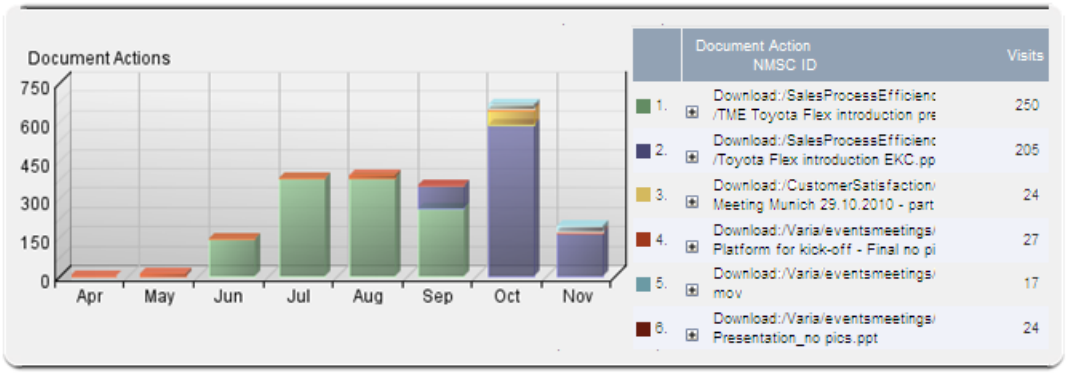
Original language of documents:

NMSC Contact person for further information:
Name: Email:
Telephone number:

Posting details on the EKC website:

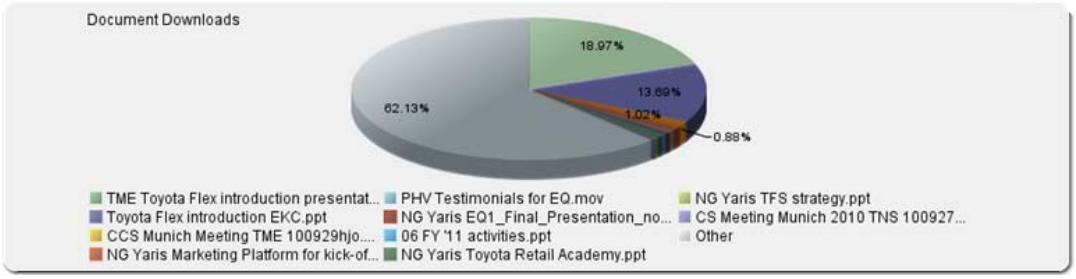
Appendix Y

Document Actions EKC



Appendix Z

Documents responsible for downloads.



Appendix AB

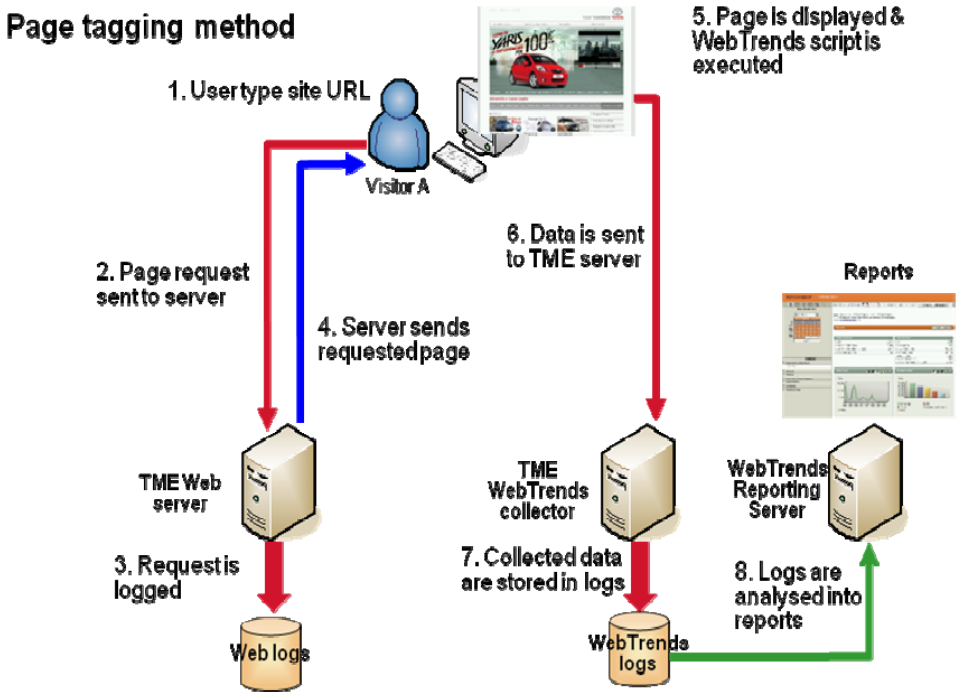
Webtrends

The Goal of WebTrends is to:

- interpret and understand the results of the EKC
- identify areas of improvements

The reason why TME uses webtrends is to better understand the effectiveness of online channels in an objective, scientific way through measurement & analysis and thereby improving ROI of website investments and develop better sites in terms of Business goals (KPI ‘s).

The following picture from the TME WebTrend Consultants shows better how the principle works:



Appendix AC

Analysis EKC according to Davenport *et al* (1998)

Looking from a management point of perspective Davenport, De Long and Beers (1998) came with criteria to test whether a VCoP is successful at fulfilling its goal.

The 4 criteria are:

1) Growth in the resources attached to the project, including people, money, and so on.
2) Growth in the volume of knowledge content and usage
3) Some evidence of financial return either for the knowledge management activity itself, or for the larger organization.
4) The likelihood that the project would survive without the support of a particular individual or two.

1)**Growth in the resources attached to the project, including people, money, etc.**

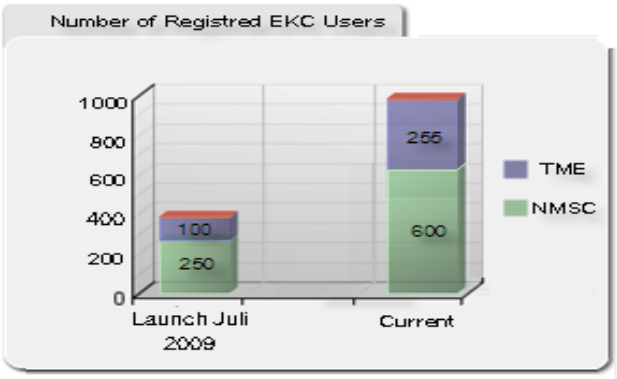
Resources and Money

Regarding money, there is no clear indication that the budget of the EKC increased. However, compared to the early beginning there are no license cost attached to each new user. This means that within Europe, there is no restriction of cost attached to the amount of users.

Next to that, there is another sight of growth in resources in the future for the EKC project. The EKC will serve as a pilot project for the new intra-and extranet which will be implemented later next year. Because the EKC turns out to be a success according to cooperate affairs this means that the EKC will function as a test project as well, where new applications and possibilities can be tested and implemented

People

If we look at the amount of users, then we can conclude that the number increased. With the thought in mind that the PPMD and Training department are also going to join the EKC, the number will become even bigger. Here is the number of registered users displayed:

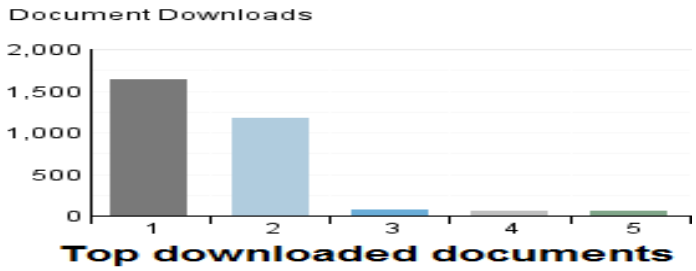


2)**Growth in the volume of knowledge content and usage**

When we look at the growth in the amount of visits, we can see a clear upward trend for the NMSC users:

2.1)**Growth in the volume of content**

The amount of content is not growing, especially when looking at the amount of growth the community has. The figure displays that there are only a few documents responsible for the amount of downloads and that there is no organic growth in the document actions. This is not good for the continuity of the EKC. Because the success of a platform like the EKC requires that knowledge contributor are willing to share their knowledge and actually share their knowledge (Ba *et al*, 2001). What must be noted though is that in sections like the Nordics, the volume of content grows. These sections are only visible for certain users with access rights.

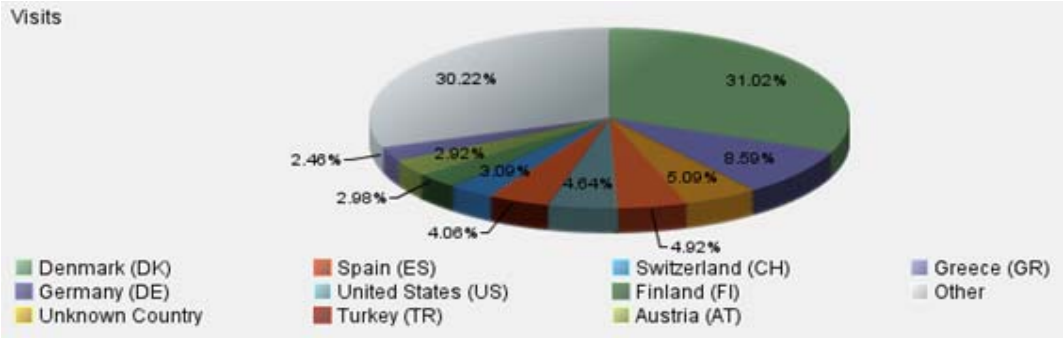


3)**Some evidence of financial return either for the knowledge management activity itself.**

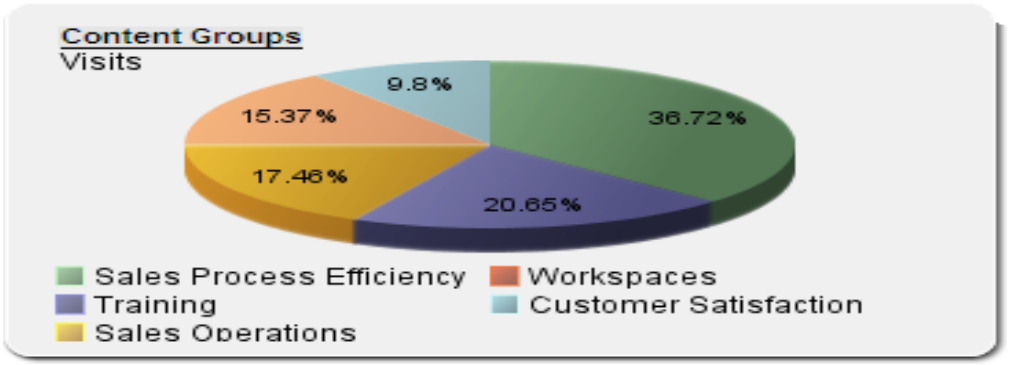
Increase of financial results due to a VCoP is very hard to measure, if not impossible. There are some measurable financial returns in terms of savings. DVD's and CD's which used to be send around are now accessible via the EKC. Another advantage is that next to the fact that the EKC serves as an VCoP, it also can be used as an document library.

4)**The likelihood that the project would survive without the support of a particular individual or two.**

Whether the EKC would survive without the support of an individual or two depends a lot on how the users are spread and thereby give an indication of not everything is coming from a few users. The usage of the EKC comes from different countries, meaning that the users of the EKC are not concentrated.



Next to the fact that the users are spread over Europe and some outside Europe, the sections are indicating whether the users are clustered. A look at the relation between the content and the section where it is put in shows us that also the content is equally spread over the EKC.



The input on the other hand and the guidance of direction comes from a few persons. The content as can be seen in the figure on the last page where it clearly shows that the EKC currently relies on a few documents posted by only a few members. Another Example is mister Fagerlund who set up the Nordic Section. This section depends a lot around his input. He can be noted as a core users and is irreplaceable, especially because the Nordic Section is still in a growing phase starting from development.

Questionnaire

Introduction questions:

Are you an employee from a NMSC or from TME? *

- ○ National Marketing and Sales Company (NMSC)
- ○ Toyota Motor Europe (TME)
- ○ Other

What is your area of profession?

Please choose only one of the following:

- ○ After Sales
- ○ Logistics
- ○ Human Resources
- ○ Product Communication
- ○ Product Planning & Marketing
- ○ Purchasing
- ○ Research & Development
- ○ Sales
- ○ Network Development

What is your mother tongue? Please select:

Have you heard about the European Knowledge Center? (EKC)

Please choose only one of the following:

- ○ Yes
- ○ No

Have you ever read the EKC - Newsletter?

- ○ Yes
- ○ No

Have you ever accessed the European Knowledge Center?

Please choose only one of the following:

- ○ Yes
- ○ No

1)People who did already access the EKC

***How do you know about the European Knowledge Centre? Via**:*

[ ] Colleagues

[ ] Newsletter

[ ] Management

[ ] Intra -/ Extranet

[ ] Via e-mail

How often do you use the European Knowledge Center? **(Chiu, Chiu, Chang, 2007)**

[ ] 2-3 times a week

[ ] once a week

[ ] Twice per month

[ ] once a month

[ ] Quarterly

[ ] Once a year

What kind of user do you consider yourself? Bourhis, Dube and Jacob (2005)

Administrator (Judges content and places content)
Core Member (Up-loads, downloads and helps for the purpose and mission of the EKC)
Community Member (Takes active ownership in the EKC)
Read-only member

1.1) Context

Phase of the community

How long are you currently active on the European Knowledge Center? (For TME)

Less than one week
Between one week and one month
Less than half a year
Less than 1 year
More than 1 year

Context : Technology / Access

What is the level of comfort you have with technology? (Dube et al, 2003)

Low (you have little experience with ICT
Medium (you have average experience with ICT
High (you have extensive experience with ICT

Ability to access

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

I know where to find the EKC website
The EKC is easy to access
I know how to access the EKC with my username and password
Browsing on the EKC is easy

Information system quality of the EKC

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

The EKC looks visually pleasing
The EKC is logically structured
The information is spread in the right way over the EKC
It is difficult to get access to information on the EKC
I prefer the engine instead of browsing on the EKC
The search engine displays relevant items when searching
The search engine for documents and information is easy to work with

Speed

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

My internet speed is not fast enough to use the EKC.
The loading of pages is fast enough

Ability to upload

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

It is clear how to submit content Wenger (2000)
I have enough IT knowledge to submit content on the EKC (Lee, Bonk, Magjuka , ( )
I experience technological problems when submitting content
It is clear under which section my content belongs
It is clear how the approval flow for submitting content works
I have sufficient information to share

1.3) Knowledge Information/ Knowledge / Content

Availability

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

The content on the EKC is up-to-date
The frequency of new content on the EKC is adequate
The content of the EKC is the kind of information that I am looking for

If I am searching for information and best-practices, I will:

Please choose all that apply:
Use the internet
Use the extranet
Request for it via e-mail
Call colleagues
Other

Codification Effort

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

A useful manual describing our sales process can be written (Zander and Kogut 1995)
Extensive documentation describing critical parts of the sales process exist in our company (Zander and Kogut 1995)
I can easily translate my knowledge into best practices

Topics Relevance

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

The EKC content is interesting enough for me to keep coming back
I think the knowledge on the EKC is relevant
The topics are relevant for my workfield
I think the information available on the EKC is interesting for me

1.4) People

Language

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

English to communicate on the EKC is difficult for me
The specialist jargon on the EKC is easily understandable for me

Self Efficacy

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

I can recognize what part of my content is interesting for sharing
My content is also useful for other NMSC sizes and markets than my own
I think the information that I have is not important enough (Ardachvili, (….)
I think my knowledge adds value to Toyota (Kankanhalli, 2005)

Commitment

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

When I need a best practice, I will start looking on the EKC
I see benefits in using the EKC to share documents, best practices and information (Perez, Araos, Barber, (…),
I believe the EKC is the platform with which to share content with other Toyota colleagues (Ordonez de Pablos, 2004)
I prefer external sources over the EKC (Katz & Allen, 1982)

Motivation

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

I am willing to share my knowledge and information with Toyota colleagues (Ardachvili et al, 2003
I see benefit in the sharing of knowledge and content (Szulanski, 2004)
I am willing to improve my work with the usage of the EKC (Szulanski, 1996)

I am motivated to contact the document owner if I need additional information Gupta et al (..)

Enjoyment

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

I like to inspire others to join (Probst, 2008)
I have enjoyment in helping others (Wasko and Faraj, 2005)
I feel good about this because it improves their professional (Wasko and Faraj, 2005)

Loss of Knowledge Power

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

I think my knowledge is a private asset and I lose competitive advantage when sharing (McLuere, Faraj, 2000)
I do not mind losing the complete ownership rights when sharing the content (Smale, 2008)
I am afraid to lose face when I will submit content (Ardachvili, (….)

1.5) Culture

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

Culture

I think the EKC is in line with the Toyota values
The EKC fits in the Toyota way of working
Toyota promotes sharing of content and best practices (Yokoten)
TME holds meetings regularly where business units discuss their goals and achievements (Maranville et al.)
TME encourages business units to share information with each other over the intranet (Maranville et al.)

Trust in members, Content Management

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

I only read the information from the sources I know
I only read information from sources that operate in the same kind of environment
I prefer external sources of information over the information on the EKC (Katz & Allen, 1982
I would consult the EKC over my colleagues for questions (Katz & Allen, 1982
I think the management is not taking advantage of my content

1.6) Strategy

Sponsor

With Coding of a 5-point Likert Scale (1= Very Bad, 5= Very Good)

Toyota Management Support for the EKC is:
Management informed us about plans and progress
Management motivates me to work with the

EKC management

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

Management informed us about plans and progress of the EKC (Bourhis, Dube et al, 2005)
Management motivates me to work with the EKC (Bourhis, Dube et al, 2005)
Management encourages me to kaizen standard operations via the EKC
Management encourages me to increase productivity via the EKC

Help

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

Useful manuals for the usage of the EKC are available
NMSC IT support is provided with help regarding IT problems (Bourhis, Dube et al, 2005)
ekc@toyota-europe.com individually helped me when I encountered problems (Bourhis et al, 2005)
ekc@toyota-europe.com spends enough time to help me (Bourhis, Dube et al, 2005)

Mission and Vision

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

The purpose of the EKC is clear (Dube, Campbell & Uys, 2007)
I know what the EKC is trying to achieve with the sharing of content
The EKC does not have a clear mission and vision
I think the EKC is in line with the Toyota values

Without Coding / Open Ended Questions

The Dependent Variable

With Coding of a 5-point Likert Scale (1= Strongly Agree, 5= Strongly Disagree)

The EKC will be a flourishing and successful project (Bourhis, Dube et al, 2005)
The EKC will reach it objectives (Bourhis, Dube et al, 2005)
The EKC Supports me in my day-to-day work
The EKC saves me time via new methods and working ways.
The EKC prevents me re-inventing the wheel because it is already on the EKC
The EKC helps me faster finding solutions when I have questions
The EKC Creates awareness for me via new best practices
The EKC provides me a place to work together with geographical dispersed colleagues
The EKC gives me access to the best practices and a library with the latest versions at any time
Other, namely:…

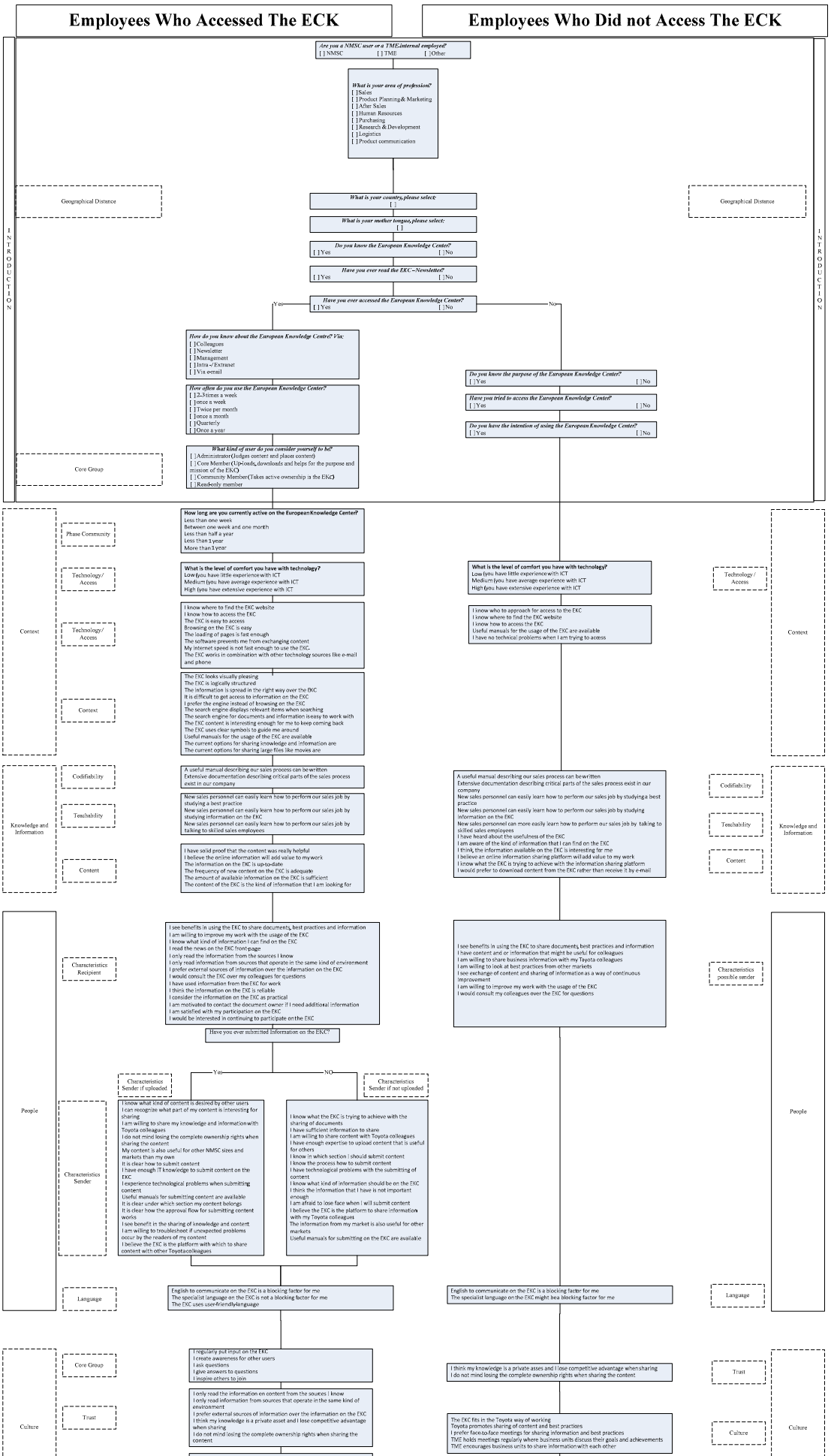
Extra questions:

In order for me, to make me want to access the EKC (more often), there should added a:

[] Blog Function
[] Wiki Function
[] Video instructions
[] Open Forum
[] Judging System for content
[] Event calendar
[] Other, namely:…

Further comments: If you have other suggestions, feedback and / or other remarks

If you are willing to be contacted for some additional questions by phone, please leave your e-mail address in the field below: (This e-mail address will not be linked to the answers of your questionnaire.)


Employees Who Accessed The ECK
Employees Who Did not Access The ECK
INTRODUCTION
Are you a NMSC user or a TME-internal employee?
[ ] NMSC [ ] TME [ ] Other
What is your area of profession?
[ ] Sales
[ ] Product Planning & Marketing
[ ] After Sales
[ ] Human Resources
[ ] Purchasing
[ ] Research & Development
[ ] Logistics
[ ] Product communication
Geographical Distance
What is your country, please select:
[ ]
What is your mother tongue, please select:
[ ]
Do you know the European Knowledge Center?
[ ] Yes [ ] No
Have you ever read the EKC – Newsletter?
[ ] Yes [ ] No
Have you ever accessed the European Knowledge Center?
[ ] Yes [ ] No
Yes
No
How do you know about the European Knowledge Center? Via:
[ ] Colleagues
[ ] Newsletter
[ ] Management
[ ] Intra-/ Extranet
[ ] Via e-mail
How often do you use the European Knowledge Center?
[ ] 2-3 times a week
[ ] once a week
[ ] Twice per month
[ ] once a month
[ ] Quarterly
[ ] Once a year
Core Group
What kind of user do you consider yourself to be?
[ ] Administrator (Judges content and places content)
[ ] Core Member (Up-loads, downloads and helps for the purpose and mission of the EKC)
[ ] Community Member (Takes active ownership in the EKC)
[ ] Read-only member
Do you know the purpose of the European Knowledge Center?
[ ] Yes [ ] No
Have you tried to access the European Knowledge Center?
[ ] Yes [ ] No
Do you have the intention of using the European Knowledge Center?
[ ] Yes [ ] No
Context
Phase Community
How long are you currently active on the European Knowledge Center?
Less than one week
Between one week and one month
Less than half a year
Less than 1 year
More than 1 year
Technology/ Access
What is the level of comfort you have with technology?
Low (you have little experience with ICT
Medium (you have average experience with ICT
High (you have extensive experience with ICT
What is the level of comfort you have with technology?
Low (you have little experience with ICT
Medium (you have average experience with ICT
High (you have extensive experience with ICT
Technology/ Access
Technology/ Access
I know where to find the EKC website
I know how to access the EKC
The EKC is easy to access
Browsing on the EKC is easy
The loading of pages is fast enough
The software prevents me from exchanging content
My internet speed is not fast enough to use the EKC
The EKC works in combination with other technology sources like e-mail and phone
I know who to approach for access to the EKC
I know where to find the EKC website
I know how to access the EKC
Useful manuals for the usage of the EKC are available
I have no technical problems when I am trying to access
Context
Context
The EKC looks visually pleasing
The EKC is logically structured
The information is spread in the right way over the EKC
It is difficult to get access to information on the EKC
I prefer the engine instead of browsing on the EKC
The search engine displays relevant items when searching
The search engine for documents and information is easy to work with
The EKC content is interesting enough for me to keep coming back
The EKC uses clear symbols to guide me around
Useful manuals for the usage of the EKC are available
The current options for sharing knowledge and information are
The current options for sharing large files like movies are
Knowledge and Information
Codifiability
A useful manual describing our sales process can be written
Extensive documentation describing critical parts of the sales process exist in our company
A useful manual describing our sales process can be written
Extensive documentation describing critical parts of the sales process exist in our company
New sales personnel can easily learn how to perform our sales job by studying a best practice
New sales personnel can easily learn how to perform our sales job by studying information on the EKC
New sales personnel can more easily learn how to perform our sales job by talking to skilled sales employees
I have heard about the usefulness of the EKC
I am aware of the kind of information that I can find on the EKC
I think, the information available on the EKC is interesting for me
I believe an online information sharing platform will add value to my work
I know what the EKC is trying to achieve with the information sharing platform
I would prefer to download content from the EKC rather than receive it by e-mail
Codifiability
Teachability
New sales personnel can easily learn how to perform our sales job by studying a best practice
New sales personnel can easily learn how to perform our sales job by studying information on the EKC
New sales personnel can more easily learn how to perform our sales job by talking to skilled sales employees
Teachability
Knowledge and Information
Content
I have solid proof that the content was really helpful
I believe the online information will add value to my work
The information on the EKC is up-to-date
The frequency of new content on the EKC is adequate
The amount of available information on the EKC is sufficient
The content of the EKC is the kind of information that I am looking for
Content
People
Characteristics Recipient
I see benefits in using the EKC to share documents, best practices and information
I am willing to improve my work with the usage of the EKC
I know what kind of information I can find on the EKC
I read the news on the EKC front-page
I only read the information from the sources I know
I only read information from sources that operate in the same kind of environment
I prefer external sources of information over the information on the EKC
I would consult the EKC over my colleagues for questions
I have used information from the EKC for work
I think the information on the EKC is reliable
I consider the information on the EKC as practical
I am motivated to contact the document owner if I need additional information
I am satisfied with my participation on the EKC
I would be interested in continuing to participate on the EKC
I see benefits in using the EKC to share documents, best practices and information
I have content and or information that might be useful for colleagues
I am willing to share business information with my Toyota colleagues
I am willing to look at best practices from other markets
I see exchange of content and sharing of information as a way of continuous improvement
I am willing to improve my work with the usage of the EKC
I would consult my colleagues over the EKC for questions
Characteristics possible sender
Have you ever submitted information on the EKC?
Yes
NO
Characteristics Sender if uploaded
Characteristics Sender if not uploaded
Characteristics Sender
I know what kind of content is desired by other users
I can recognize what part of my content is interesting for sharing
I am willing to share my knowledge and information with Toyota colleagues
I do not mind losing the complete ownership rights when sharing the content
My content is also useful for other NMSC sizes and markets than my own
It is clear how to submit content
I have enough IT knowledge to submit content on the EKC
I experience technological problems when submitting content
Useful manuals for submitting content are available
It is clear under which section my content belongs
It is clear how the approval flow for submitting content works
I see benefit in the sharing of knowledge and content
I am willing to troubleshoot if unexpected problems occur by the readers of my content
I believe the EKC is the platform with which to share content with other Toyota colleagues
I know what the EKC is trying to achieve with the sharing of documents
I have sufficient information to share
I am willing to share content with Toyota colleagues
I have enough expertise to upload content that is useful for others
I know in which section I should submit content
I know the process how to submit content
I have technological problems with the submitting of content
I know what kind of information should be on the EKC
I think the information that I have is not important enough
I am afraid to lose face when I will submit content
I believe the EKC is the platform to share information with my Toyota colleagues
The information from my market is also useful for other markets
Useful manuals for submitting on the EKC are available
Language
English to communicate on the EKC is a blocking factor for me
The specialist language on the EKC is not a blocking factor for me
The EKC uses user-friendly language
English to communicate on the EKC is a blocking factor for me
The specialist language on the EKC might be a blocking factor for me
Language
Culture
Core Group
I regularly put input on the EKC
I create awareness for other users
I ask questions
I give answers to questions
I inspire others to join
Trust
I think my knowledge is a private asses and I lose competitive advantage when sharing
I do not mind losing the complete ownership rights when sharing the content
Trust
Trust
I only read the information on content from the sources I know
I only read information from sources that operate in the same kind of environment
I prefer external sources of information over the information on the EKC
I think my knowledge is a private asset and I lose competitive advantage when sharing
I do not mind losing the complete ownership rights when sharing the content
The EKC fits in the Toyota way of working
Toyota promotes sharing of content and best practices
I prefer face-to-face meetings for sharing information and best practices
TME holds meetings regularly where business units discuss their goals and achievements
TME encourages business units to share information with each other
Culture
Culture