

**LAPPEENRANTA UNIVERSITY OF TECHNOLOGY**

**Department of Industrial Engineering and Management**

Section of International Operations and Marketing

**FACTORS AFFECTING INNOVATION ADOPTION IN  
ORGANIZATIONS:  
The Case of Corporate Website Adoption**

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## ABSTRACT

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<p>The thesis studied organizational adoption of innovations. The purpose was to clarify the factors that affected innovation adoption timing and to categorize organizations into adopter categories. The empirical part of the present study concentrated on the adoption of corporate websites. A mail survey was conducted among small and medium sized Finnish industrial companies, and the response rate was quite high (60%). The measurement scales were formed based on previous literature and their reliabilities were quite high. A regression analysis was applied when the factors affecting adoption timing were clarified. The adopter categories were formed with the help of cluster analysis, and the differences between the categories were studied with variance analyses. Three special factors were identified to explain the timing at which the adoption occurred. These were perceived relative advantage, commitment of management team in the adoption process and the amount of strategic partners. Four adopter categories (innovators, early adopters, early majority and laggards) were identified based on the innovativeness of the companies, the innovativeness included dimensions of the timing of the awareness of internet pages, the timing of adoption decision and the length of the implementation period. Several significant differences were found in the characteristics between companies in the different adopter categories.</p>			

## TIIVISTELMÄ

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<p>Diplomityössä tutkittiin innovaatioiden omaksumista organisaatioissa, ja tarkoituksena oli selvittää tekijät, jotka vaikuttivat omaksumisajankohtaan sekä luokitella yritykset omaksujaryhmiin. Työn empiirinen osuus tarkasteli yritysten internet-kotisivujen omaksumista. Tutkimuksen empiirinen aineisto kerättiin postikyselyn avulla, ja vastausprosentti kyselyssä oli melko hyvä (60%). Aikaisempien tutkimusten pohjalta muodostettiin eri tekijöille mittarit, jotka analyysien perusteella olivat erittäin luotettavia. Regressioanalyysia sovellettiin, kun pyrittiin selvittämään omaksumisajankohtaan vaikuttavia tekijöitä, ja klusterianalyysiä käytettiin apuna omaksujaluokkien muodostamisessa. Omaksujaluokkien väliset erot selvitettiin varianssianalyysillä. Tutkimuksessa löydettiin kolme omaksumisajankohtaan vaikuttavaa tekijää: (1) innovaation koettu suhteellinen hyöty, (2) yritysjohdon sitoutuminen omaksumisprosessiin, sekä (3) yrityksen strategisten partnereiden määrä. Yritykset luokiteltiin neljään omaksujaluokkaan (innovaattorit, aikaiset omaksijat, aikainen enemmistö ja myöhäinen enemmistö) innovatiivisuuden perusteella. Innovatiivisuutta mitattiin kolmella indikaattorilla, jotka olivat: (1) ajankohta, jolloin yritys tuli tietoiseksi internet-sivuista, (2) ajankohta, jolloin tehtiin omaksumispäätös sekä (3) aika, joka kului internet-sivujen käyttöönottoon. Omaksujaluokkien välillä tunnistettiin lukuisia eroja eri ominaisuuksien suhteen.</p>			

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# **1 INTRODUCTION**

## ***1.1 Innovation Adoption as a Research Object in Marketing***

Innovations are being introduced all the time in the field of information and communication technology (ICT), and individuals as well as organizations adopt these innovations. Thus, new products and services must be introduced to markets rapidly and successfully, before competitors take over. In the organizational point of view, the most optimal buyers need to be identified and market efforts directed optimally. In the introduction stage of an innovation it is crucial to identify the profile of organizations and individuals most likely to adopt a new innovation in the infocom field.

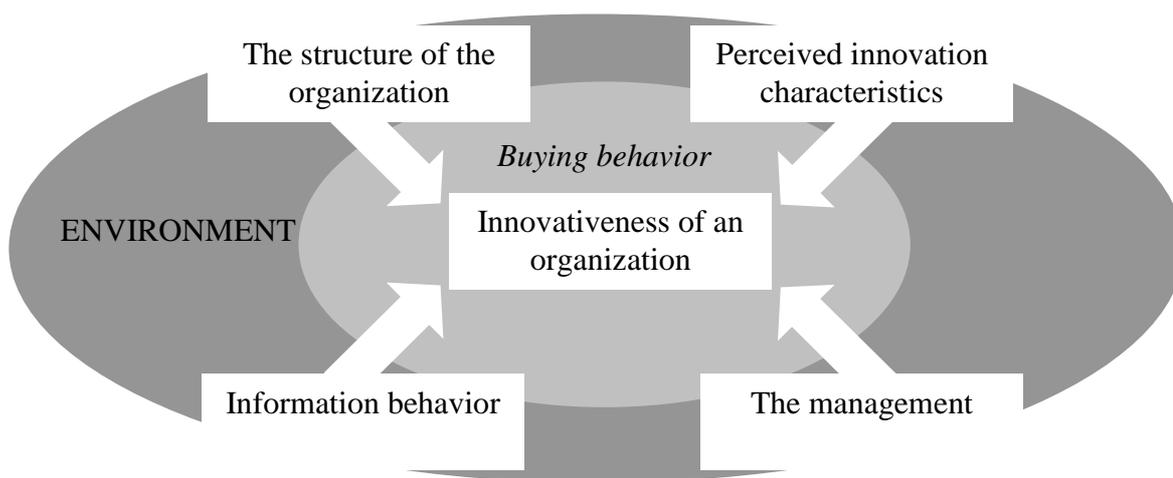
Most of the studies related to innovation adoption have been discussing innovation adoption context and decision processes of consumers. Many times organizations and individuals working in them are the real end-users of many innovations. In organizations, innovation adoption is strongly affected by structural characteristics of organizations as well as the decision-making processes considering the adoption of new products or services. Although an individual can be the end-user of an innovation in an organization, an individual employee rarely does the decisions concerning innovation adoption. When all of these facts are gathered together, the marketer of a new innovation is in front of a difficult task, as it must be decided which companies are the potential first adopters, and which are the correct marketing efforts to apply.

## ***1.2 Purpose of the Present Study and Research Questions***

There are two main objectives in the present study. The first objective of the study is to recognize the critical factors that affect the adoption of innovation in organizations. Literature and previous studies suggest that, (1) the structural characteristics of organizations should be taken into account (e.g. Aiken and Hage 1971, Gauvin and Sinha 1993, Grover et al. 1995) as well as the (2) innovation characteristics (Moore and Benbasat 1991, Karahanna and Straub 1998), which are considered as one of the main antecedents in innovation adoption. (3) The management team of the organization is in key position in innovation adoption, since managers have the ability to make decisions,

and on the other hand their attitudes and actions affect the receptivity of innovations inside the organization (e.g. Zaltman et al. 1984, Sultan and Chan 2000). In addition, (4) environmental factors are taken into account (e.g. Miller and Friesen 1982, Grover et al. 1995), as well as (5) the information behavior in organizations (e.g. Miller and Friesen 1982). It should not be forgotten that innovation adoption requires a buying decision in organizations, and is usually involving more than one decider.

As the second objective, organizations are classified into adopter categories based on their innovativeness, i.e. adoption timing. This is done to help the marketers target their new innovations to right companies at the introduction stage of it. Also if the adopter categories can be recognized, the marketing efforts and the marketing messages can be planned correctly in each stage of the product life-cycle to the right and most potential customer groups. The structural characteristics of organizations, perceived innovation characteristics, managerial issues, information behavior and environmental characteristics are compared between the categories in order to find out the relative differences between the categories. The buying behavior point of view is considered due to the composition of the buying center, the people in the company making the adoption decision. In different companies, there are different people taking part in the decision-making with different kinds of contribution to the decision-making. When the right person can be identified, the marketing efforts of new innovations can be targeted correctly.



**Figure 1-1 Objective of the Present Study**

### ***1.3 Research Methods***

The empirical part of the study discusses the adoption of internet pages in Finnish manufacturing companies. Based on the literature several hypotheses were formed and tested with the help of a mail survey data. The survey was targeted to Finnish companies operating in the field of traditional manufacturing industry. The data was collected during May and June 2002. The data collection process had three parts. In the first part, the target companies were contacted by telephone, in order to find the right person to answer the questions and to confirm the respondent's willingness to take part in the survey. The second part was the mailing and during this the data was collected. The last part included a so-called follow-up, which was conducted in order to improve the response rate.

For the analysis, the collected data was coded into the SPSS –statistical analysis program. The analysis part consists of several different statistical analyses and tests. At first some descriptive analyses were made to describe the data. Next, the measurement constructs for organizational, innovation, managerial, information behavior and environmental characteristics were formed applying factor analysis. After this, a regression analysis with backward elimination estimation was conducted in order to test the hypotheses and find out the key factors that explain the adoption timing of corporate websites.

Finally organizations were categorized into adopter categories based on (1) the timing of awareness of internet pages, (2) the timing of adoption decision, and (3) the time that was required to implement the websites. The method applied for this was the *k*-means cluster analysis. The differences between adopter categories were recognized using the measurement scales created earlier and applying the suitable variance analyses and *t*-tests.

## ***1.4 Structure of the Study***

The structure of the study is presented in Figure 1-2.

*Chapter Two* discusses the diffusion of innovation. In the beginning, the definitions attached to diffusion are presented and basic diffusion theories are introduced. Then, the focus turns to innovation adoption, and finally, the network approach to diffusion is briefly discussed.

*Chapter Three* defines different types of innovations, as well as the sources of innovation. The most critical perceived innovation characteristics that effect the adoption are introduced.

*Chapter Four* discusses the innovation decision in general and applied to organizations. Three main stages of innovation decisions are recognized: 1) initiation stage, 2) decision stage and 3) implementation stage. This chapter takes a look at the organizational buying behavior and attaches some characteristics of it to innovation adoption. A quick look is given to organizational buying center and the concept of buying center is discussed.

*Chapter Five* discusses innovation adopter categories formed on the basis of innovativeness. The characteristics of each category are briefly described. Different concepts and measures of organizational innovativeness are introduced.

*Chapter Six* introduces the commonly found factors that affect the innovation adoption in organizations. The factors can be divided in structural, managerial, environmental and information behavior factors. These are mainly organization dependent and they vary across organizations.

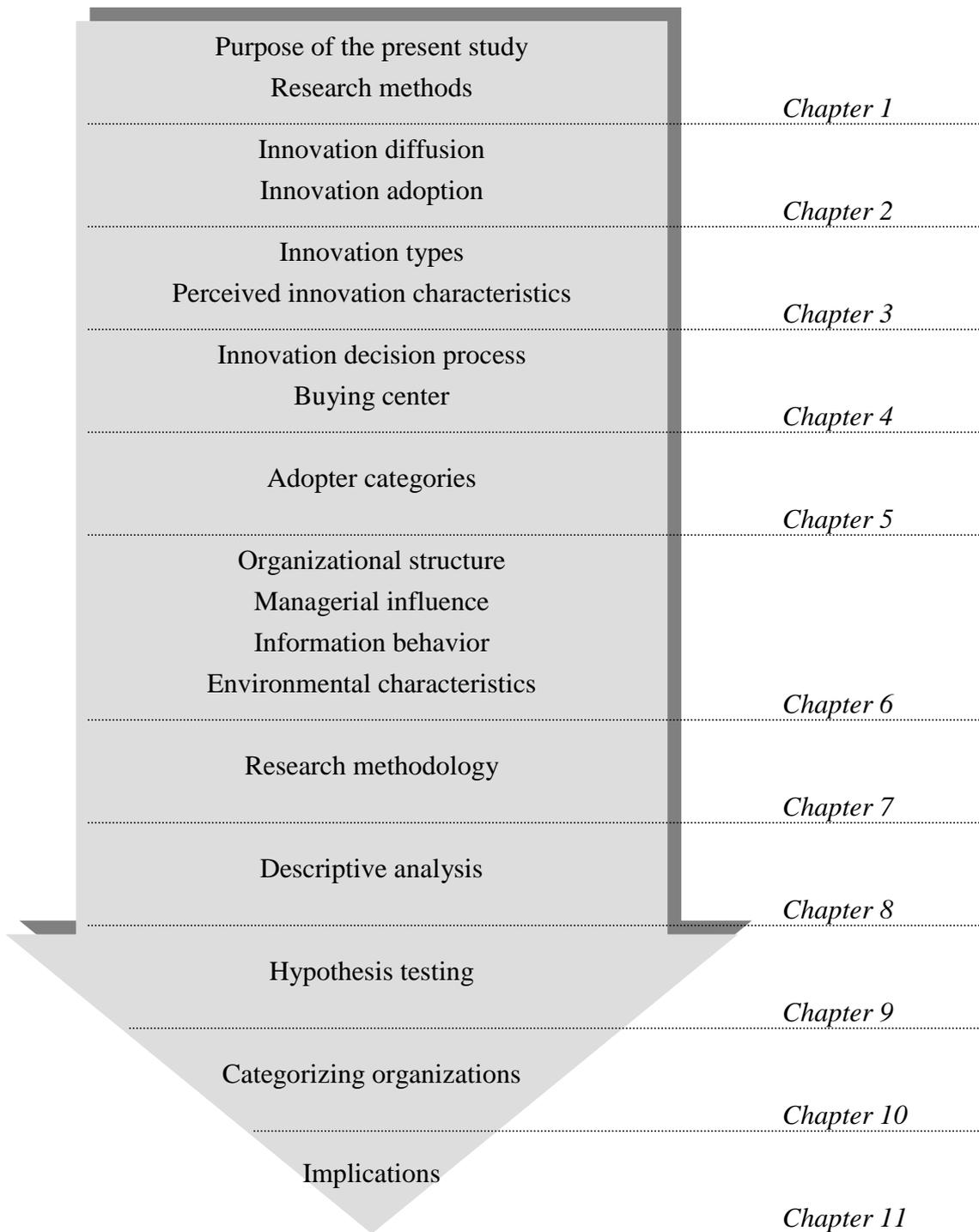
*Chapter Seven* discusses the issues related to research methodology, and the phases of the data collection process in the present study, beginning with the questionnaire design. After this, the focus turns on sampling and selection of the data collection method. A look is given to questionnaire pretesting and its importance in quantitative surveys. Finally, the response rate of the present study is discussed and the methods that were applied to improve it.

*Chapter Eight* gives a descriptive analysis of the data beginning with response behavior and descriptive characteristics of respondents. Finally, the measurement scales are created and confirmed with reliability and factor analyses.

*Chapter Nine* determines the factors that affect corporate website adoption timing. The method applied for this was the regression analysis using the backward elimination estimation. The hypotheses are analyzed based on the regression results.

*Chapter Ten* discusses the forming of adopter categories with cluster analysis. The main differences between these categories are identified.

*Chapter Eleven* discusses theoretical and managerial implications, as well as few aspects for further research.



**Figure 1-2 Structure of the Study**

## 2 DIFFUSION OF INNOVATIONS

This chapter discusses the main concepts and definitions related to the diffusion of innovations. The basic theories of diffusion are briefly introduced. After that, the adoption point of view is discussed and also the network approach to diffusion is briefly introduced.

### 2.1 Definitions

Rogers (1995, p. 5) defines diffusion as “*the process by which an innovation is communicated through certain channels over time among the members of a social system. In that special type of communication messages are concerned with new ideas*”. From this definition it is possible to identify the four main elements of diffusion process: (1) the innovation, (2) communication channels, (3) time, and (4) the social system. The newness of the idea in the message content gives diffusion its special character and it means that some degree of uncertainty is involved in diffusion.

Additionally, it is important to define the concept of innovation. Rogers (1995, p. 11) defines an innovation as “*an idea, practice, or object that is perceived as new by an individual or other unit of adoption*”. Based on this definition, innovation can be almost anything as long as it is new for the adopter.

As individuals or organizations are the final users of innovations, the concept of adoption is defined by Rogers (1995, p. 171) as “*a decision to make full use of an innovation as the best course of action available*”. Correspondingly, rejection is a *decision not to adopt an innovation*.

In the present study, the internet pages are an innovation, that is new to the adopting organization. The timing at which they made the decision to adopt their first internet pages is under critical examination.

## 2.2 *Basic Theories of Diffusion*

The focus of diffusion research has been on the innovation and the practical concern is how to develop and market innovations to enhance more rapid acceptance (Damanpour 1988). Diffusion theory as a theory of communication has been studied extensively in the literature from the point of view of different disciplines and with respect to different types of products, services and ideas (Martinez et al. 1998).

The knowledge of how the diffusion of products, services or ideas takes place within a social system, helps us better understand the behavior of the members, who make up that system. Not all the innovations that enter the market are diffused at the same speed (Martinez et al. 1998). Some products or services are accepted very quickly, while others remain in the market for lengthy period of time until they are acquired by the majority. The speed of adoption of a new idea will depend on the result of the process of transmission or reception of information, in such way that potential adopters will accept it at different moment of time.

From the literature it is possible to identify three basic models of diffusion. The first one of these is the Bass model, which has been used most often. Another basic models are the ones created by Fourt and Woodlock (1960) and Mansfield (1961). All these models attempt to predict the number of adopters at some time  $t$ .

Bass (1969) developed an innovation diffusion model, in which it was supposed that the potential adopters of an innovation are influenced by two mean of communication: internal and external influence. At this point Fourt et al (1960) considered only the external information and Mansfield (1961) the internal information. In Mansfield's (1961) work the diffusion process follows the logistic function, and in Fourt et al's (1960) work the modified exponential function. Bass (1969) combined these to models resulting an S-shaped curve (see Fig. 2-1). The following notions are included in the Bass (1969) model: (1) within the time frame there will be  $m$  first purchases of the product and no repeat purchases, (2) diffusion is a communication process, where the decision to purchase at a certain time is due to (a) innovativeness, i.e. affected by external information and denoted with the model parameter  $p$ , and (b) imitation, i.e. affected by the internal information from earlier adopters. In the model, parameter  $q$

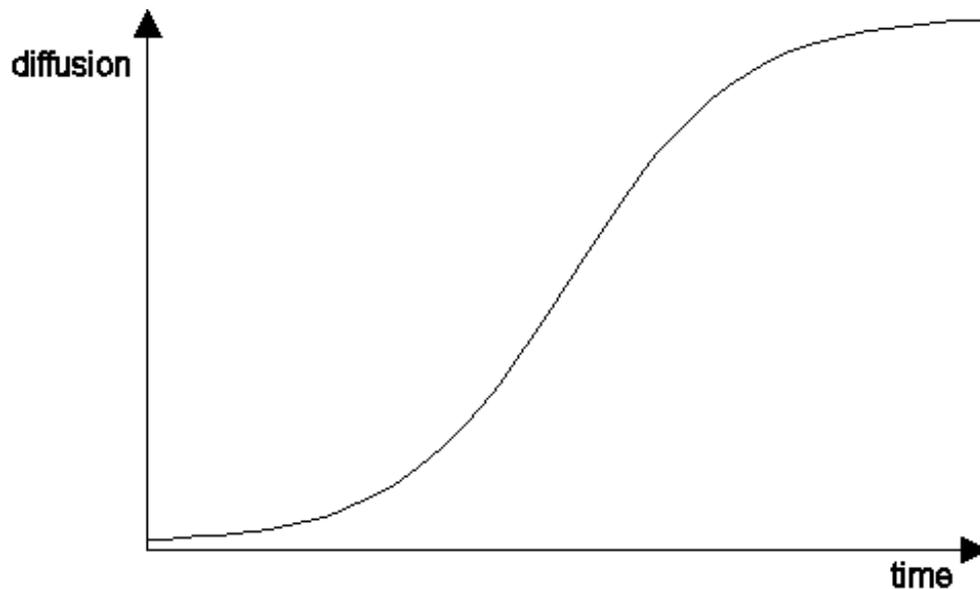
captures the imitation effect, and  $Y(T)$  represents the number of previous buyers. Thus, (3) the probability to adopt at time  $T$  is assumed to be:

$$P(T) = p + (q/m)Y(T) \quad (1)$$

and (4) assuming that there are no repeat purchases, the total amount of purchases at time  $T$  is given by:

$$S(T) = P(T)(m - Y(T)) = pm + (q - p)Y(T) - (q/m)(Y(T))^2 \quad (2)$$

Geroski (2000) considers the S-curve as one of the most popular methods used in diffusion research. The S-curve is described as an epidemic model of information diffusion.



**Figure 2-1 S-Curve of Innovation Diffusion**

According to Geroski (2000) the word-of-mouth model cannot explain the diffusion of innovation from the date it is invented, but only from the date when some number of early users have begun to use it. In other words, the word-of-mouth effect begins after an initial base of users has been built up. This indicates that the larger the initial base of users, the faster is diffusion.

### 2.3 Adoption of Innovations

The diffusion of an innovation in a population involves the adoption of the innovation by individuals in the relevant population. Adoption in turn, involves a deliberate choice decision on the part of the individual, especially in the case of high involvement products (Chatterjee and Eliashberg 1990). Geroski (2000) suggested that differences between individuals may have a potentially important role to play in explaining patterns of diffusion. The key to adoption seems to be the profitability of adopting the new innovation. This means that an individual will adopt an innovation if  $x_i$  exceeds some threshold level,  $x^*$ . The implication is that individuals differ in their characteristics, and Geroski (2000) proposed that  $x_i$  is distributed across the population according to some function of  $f(x)$ . This leads to the bell-shaped curve of innovation adoptions across time (see Fig. 2-2). Rogers (1995) suggested that the number of adopters at some time  $t$  follows normal distribution (see Fig. 2-2). Rogers (1995) divided adopters into five categories based on the timing of adoption. The first 2.5 percent of the adopters are innovators. Early adopters cover the next 13.5 percent of adopters, early majority 34 percent, late majority 34 percent, and laggards 16 percent.

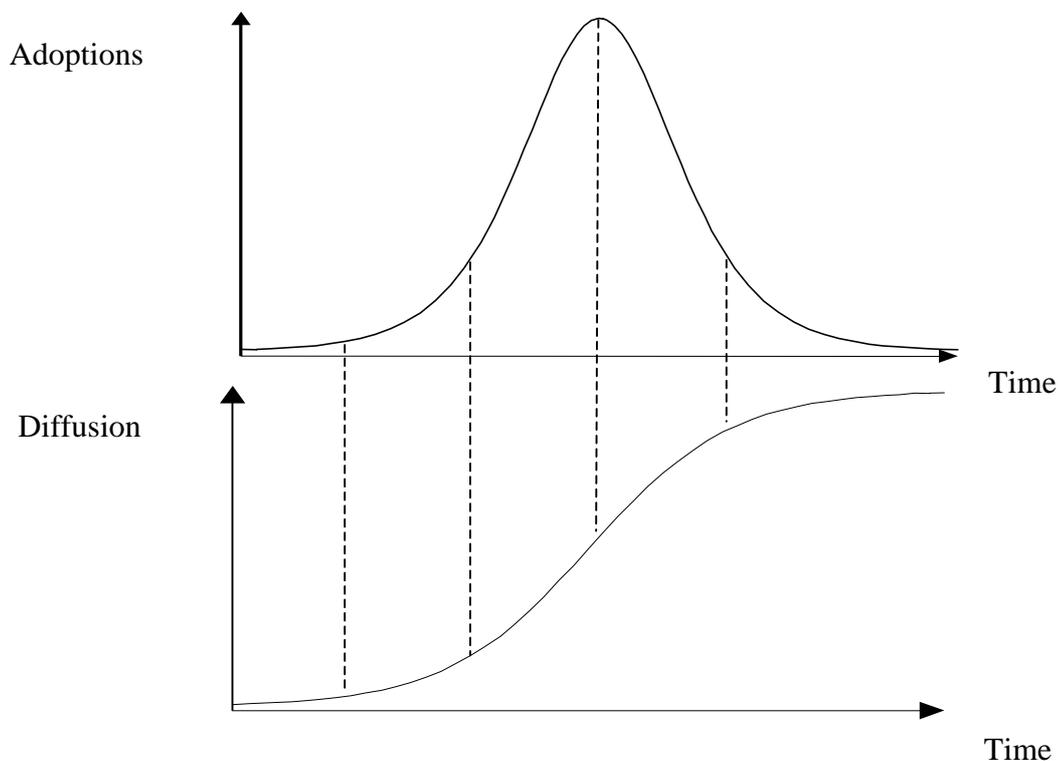


Figure 2-2 Combination of Innovation Diffusion And Adoption

These five adopter categories are assumed to differ from each other based on individual characteristics i.e. socioeconomic, personality and communication behavior. The adopter categories are discussed more detailed in chapter five. However, Rogers (1995) reminds that the S-curve is innovation-specific and system-specific, describing the diffusion of a particular new idea among the member-units of a particular system.

Once the overall target market for the innovation is selected, the firm should specifically target the innovators and early adopters in this target market. As the product gains acceptance, the focus of attention should shift to the early and late majority, who are now more inclined to adopt the innovation because of word-of-mouth reports from innovators and early adopters (Wright and Charlett 1995). Once the characteristics of adopter categories are identified, the advertising and the usage of media can be correctly targeted to right adopter category.

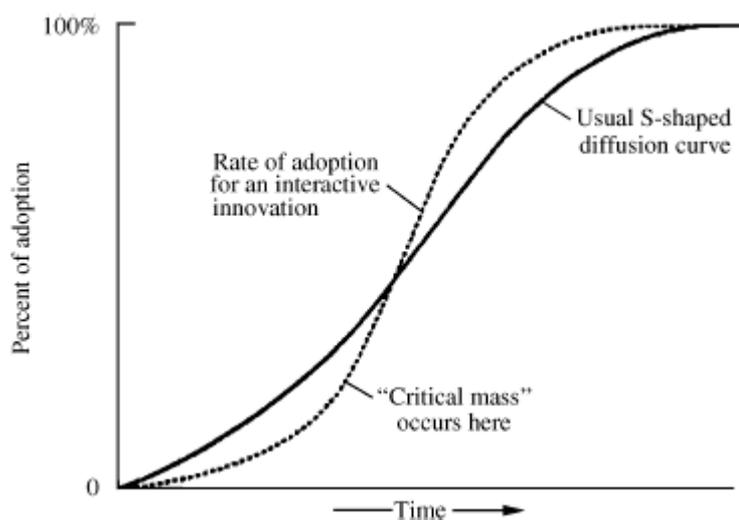
#### ***2.4 Network Approach to Innovation Diffusion***

Innovation diffusion and adoption can be also discussed from a network point of view. Employees within an organization are involved in a set of exchange relations and these can include the exchange of knowledge, information and expertise with other social sectors, both within and across industrial sectors. Though organizational research on inter-organizational networks has concentrated on formal or contractual relationships, the less formal networks may be more important for the diffusion process. (Robertson et al. 1996)

There exist so called weak ties among different social groups. According to Robertson et al. (1986), in organizational context these might be sporadic meetings with distant acquaintances of former colleagues, and they link individuals who are associated only marginally in their usual activities. Rogers (1995) proposed that weak ties are important, because an individual's close friends seldom know much that the individual does not already know. Additionally, weak ties among organizations can help to generate a climate of trust from which more formal collaboration networks can evolve and these collaborative networks are seen as central to the innovation process (Alter and Hage 1993).

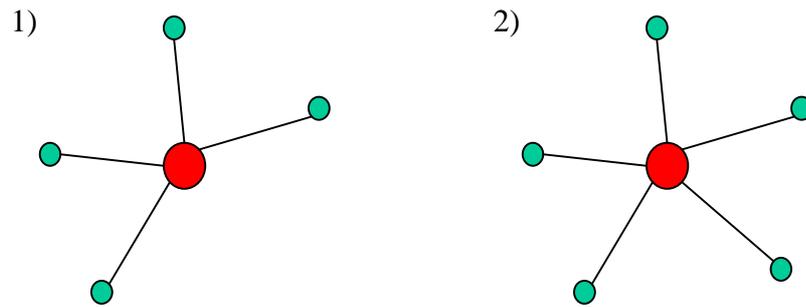
## Critical Mass

Network externalities are having a greater effect on adoption of interactive media and telecommunications. A critical mass needs to be achieved before the further rate of adoption becomes self-sustaining. An interactive innovation is of little use to an adopting individual unless other individuals with whom the adopter wishes to communicate also adopt (Rogers 1995). This means that a critical mass of individuals must adopt an interactive communication technology before it has utility for the average individual in the system. Thus, each additional adopter increases the utility of interactive communications for all adopters. Until a critical mass occurs at a relative early stage in the diffusion process, the rate of adoption is slow. After the critical mass is achieved, the rate of adoption accelerates (Rogers 1995).



**Figure 2-3 Critical Mass And the Diffusion Curve (Mahler and Rogers 1999)**

Figure 2-3 represents the network effects on the S-curve. It has to be remembered that the critical mass isn't always achieved. This kind of situation is illustrated by lowest curve in the Figure 2-3. Every new user of some innovation in a network brings along  $n(n-1)$  new connections possible to use through the network,  $n$  means number of adopters in the network. However, this isn't the real amount of applied connections, because everyone doesn't need to communicate with each other.



**Figure 2-4 Example of the network effects (see e.g. Valente 1995)**

Figure 2-4 illustrates the networks effect. In the first case, there are four subscribers in the network and twelve possible connections. In the second case, one new adopter subscribes to the network and the number of possible connections arises to 25. For example, network effects are present in SMS (short message services) adoption in consumer markets and in organizational markets the corresponding effects can be seen in EDI (electronic data interchange) adoption.

An organization may adopt an innovation based on the number of other interrelated organizations in their market environment that have adopted the focal innovation. The value of an innovation and hence its adoption propability is determined by the number of other users. In organizational innovation adoption, positive network externalities exist, when the intrinsic utility of an innovation increases when a firm’s suppliers, customers, competitors, or other organizations also use the innovation. (Frambach and Schillewaert 2002) As an example, Frambach and Schillewaert (2002) mentioned information systems investments that may generate a greater value and gain importance once a sufficient number of business partners use these systems.

## ***2.5 Organizational versus Consumer Adoption Behavior***

Innovations are many times adopted by organizations, and thus an individual is unable to adopt an innovation before an organization has adopted it. Once a decision to adopt has been made in an organization, implementation doesn’t always follow directly. It can be said that innovation decision process in organizations is much more complex than the same process by individuals. In the implementation stage there are usually

involved a number of individuals and each of them plays a different role in the process.  
(Rogers 1995)

An organization as an adopter differs from consumers in innovative behavior as the personal characteristics determine the innovativeness of consumers and the size and structure function as determinants of organizational innovativeness. Consumers tend to satisfy individuals needs with innovation adoption while organizations adopt innovations in order to carry out value-adding activities. Organizations tend to seek increased efficiency or effectiveness of their activities through adoption of innovations. The adoption of innovations in organizations involves usually a long-term commitment with a high degree of perceived risk than in the case of consumer adoption. (Frambach et al. 1998)

### **3 INNOVATION CHARACTERISTICS AFFECTING OF INNOVATION ADOPTION**

#### ***3.1 Concept of Innovation in Organizations***

According to Daft (1986) an innovation can be a new product or a service, a new production process technology, a new structure or administrative system, or a new plan, or a program pertaining to organizational members. Innovation is defined as adoption of an inproduct, or service that is new to the adopting organization. The adoption of innovation is intended to contribute to the performance or effectiveness of the adopting organization (Damanpour 1991). Organizational change is the adoption of new idea or behavior by an organization. Organizational innovation is the adoption of an idea or behavior that is new to the organization's industry, market, or general environment (Daft 1986).

Zaltman (1984) defines innovation in three different ways. In some contexts innovation can be synonymous to invention and refers to a creative process whereby two or more existing concepts or entities are combined in some novel way to produce a configuration not previously known by the person involved. The second view of innovation refers it as a process starting with the recognition of a potential demand for, and technical feasibility of an item and ending with its widespread utilization. This is suggested to be the broadest use of the term innovation. Thirdly, the term innovation is used to describe only the process whereby an existing innovation becomes a part of an adopter's cognitive state and behavioral repertoire.

According to Zahra and Covin (1994) the emphasis on the rate or speed of adoption is related to a pattern that a firm follows in developing or acquiring innovation. This is referred to the source of innovation and determines the capabilities and skills a firm must possess to adopt innovations. The major sources of innovation are (1) imitative, (2) acquisitive, and (3) incubative. The imitative source reflects a firm's disposition to copy innovations first introduced in by other firms, either in its own population or in other organizational population. The acquisitive source reflects a firm's disposition to acquire innovations that have been developed by other firms through purchase, licensing,

acquisition, or merger. The incubative source reflects the firm's disposition to develop its own innovations, through internal development or joint venture. The source of innovation is considered important because the attention and managerial resources given to other source, will take attention and resources away from another source. In the present study, the internet pages as an innovations, is developed outside the organization, i.e. the organization is buying them.

### ***3.2 Type of Innovation***

The type of innovation can be discussed with two different classifications. The first classification discusses innovations as technical or administrative ones. The second way divides innovations into incremental and radical ones based on the newness of the innovation. Both of these are discussed briefly.

A technical innovation is defined to occur in the operating component and affect the technical system of an organization (Damanpour et al. 1989). It consists of the equipment and methods of operations used to transform materials or information into products and services. It is suggested that the structure and the processes of the organization as well as the behavior of its members should change for the successful adoption of technical innovations (Damanpour et al. 1989). Technical innovations are related to the basic work activity of the organization. They are products, services or production process innovations (Damanpour and Evan 1984).

An administrative innovation is defined to occur in the administrative component and affect the social system of an organization (Damanpour et al. 1989). An administrative innovation doesn't provide a new product or a new service, but it indirectly influences the introduction of products or services or the process of producing them.

Administrative innovations are indirectly related to the basic work activities of the organization and more directly related to its management. They involve organizational structure and administrative processes (Damanpour and Evan 1984).

In companies the rate of adoption of both administrative and technical innovations should be balanced. This helps organizations to maintain or improve their level of performance than either administrative or technical innovations alone (Damanpour et al.

1989). Damanpour (1988) summarized that the distinction between administrative versus technical innovations is important because it relates to a more general distinction between social structures and technology. They also imply potentially different decision-making processes.

Innovation can be classified into radical and incremental categories, where incremental innovations are minor improvements or simple adjustments in current technology, and radical innovations are described as fundamental changes that represent revolutionary changes in technology. Zaltman (1984) defined radical innovations in terms of existing alternatives: the more an innovation differs from existing alternatives, the higher is its degree of radicalness. Thus they produce fundamental changes in the activities of the organization and represent clear departures from existing practice (Damanpour 1988).

### ***3.3 Financial Status of Innovation***

#### **3.3.1 Innovation Costs**

The cost of an innovation might have crucial effects on its adoption. Ettlé and Vellenga (1979) found that the single best predictor of the time required to progress from one stage of the decision-making process to the next was the cost of an innovation. Zaltman (1984) discussed innovation costs as financial and social costs. The financial costs are formed from initial and continuing costs, and social cost is said to be another form of expense. It may become in the form of ridicule, ostracism, or even exclusion or expulsion from some relevant reference group. Geroski (2000) discusses innovation costs as learning and search costs and switching costs as well as opportunity costs. Learning and search costs occur after the innovation is first introduced and the benefits of adopting new technologies are often difficult to measure with certainty. As time passes, more information is available to reassess the expected returns and risk involved. Switching costs refer to the factors that tie organizations into existing technologies. Geroski (2000) considers this as a slowing factor to diffusion of new technologies. These costs include e.g. direct costs of software acquisition. Opportunity costs are usually created by previous investments in machinery which have not fully depreciated.

The innovation costs can be primary or secondary (Moore and Benbasat 1991, Kuan and Chau 2001). The actual cost that is paid for the innovation is a primary characteristic and the perceived cost is a secondary characteristic. The definition of cost can be different among organizations; thus what appears to be costly to an adopter organization, can be inexpensive to another. This means that if two organizations have the exact same financial conditions, one of them may consider itself having high financial status and the other considers itself having a low financial status. The meta-analysis by Tornatzky and Klein (1982) revealed that both positive and negative relations have been found between innovation cost and adoption.

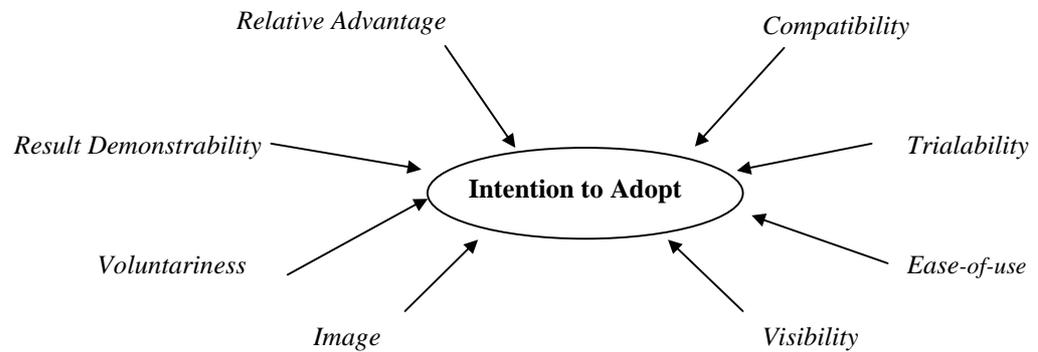
### **3.3.2 Return on Investment**

Return on investment is of great significance among organizations with particularly scarce resources or short-term investment policy preferences (Zaltman et al. 1984). Mansfield (1961) studied the profitability of innovations, and according to his work, the more profitable the investment to an innovation is relative to others that are available, the greater is the chance that a firm's estimate of the profitability will be high enough to compensate for whatever risks are involved and that it will seem worthwhile to install the new technique rather than to wait. Thus, the probability that a firm will introduce a new technique is an increasing function of the proportion of firms already using it and the profitability of doing so, but a decreasing function of the size of the investment required. Walczuch et al (2000) supported the notion that innovation adoption has a negative relationship with the return on investment in a study of internet adoption. In their study, the most important reason for companies not adopting corporate web site was the fact that companies didn't see any increases in efficiency or in sales.

### **3.4 *Perceived Characteristics of an Innovation***

The first categories of innovation characteristics affecting adoption were created by Rogers (1983), these characteristics were relative advantage, compatibility, complexity, trialability and observability. Moore and Benbasat (1991) increased the amount of characteristics to eight and formed a model of perceived characteristics of innovating illustrated in Figure 3-1. Complexity was renamed as ease-of-use and observability was

divided into visibility and result demonstrability. As a new characteristic they introduced voluntariness of adoption.



**Figure 3-1 Intention to Adopt Model Using PCI Measures. (Plouffe et al. 2000)**

Perceived innovation characteristics drive the adoption process and are influenced by external variables like the potential adopter’s environment and supplier of the innovation (Frambach and Schillewaert 2002). The perceptions of an innovation by members of an organization’s decision-making unit affect their evaluation of and propensity to adopt a new product (Frambach and Schillewaert 2002). The perceived benefits, including incentives of adopting the innovation should exceed that of alternatives, if organizations are to consider adopting.

### **3.4.1 Relative Advantage**

Relative advantage is “*the degree to which an innovation is perceived better than the idea it supersedes*” (Rogers 1995, p. 15), and is thus important. According to Rogers (1995) relative advantage can be measured in economic terms, but social prestige, convenience, and satisfaction are also important factors. Relative advantage is critical, if there exists something that the innovation does and other alternatives don’t. Though Tornatzky and Klein (1982) criticized, that “being better” is a general notion and that relative advantage studies lack conceptual strength, reliability and prescriptive power. However, Moore and Benbasat (1991) compared adopters and nonadopters of personal workstations, and resulted that adopters had significantly higher perception of relative advantage. Karahanna et al. (1999) discussed relative advantage as perceived usefulness

in their study concerning Windows adoption in organizations. They also supported the notion that relative advantage is perceived higher among adopters than nonadopters. Thus, the present study hypothesizes, that:

*H1: The higher the perceived relative advantage of an innovation, the sooner it will be adopted.*

### **3.4.2 Image and Voluntariness**

Image represents “*the degree to which an individual believes that an innovation will bestow them with added prestige or status in their relevant community*” (Plouffe et al. 2001, p. 68). Image carries along the social approval associated with innovation adoption. Voluntariness reflects “*the extent to which innovation is perceived to be under an individual’s volitional control*” (Plouffe et al. 2001, p. 68). Moore and Benbasat (1991) took into account that sometimes innovation is forced on individuals in organizational adoption context. In the case of internet pages, the perceived voluntariness isn’t a relevant issue, since there would be less employees operating in their updating and creation. But in the case of image, it is hypothesized that:

*H2: High perceived image has a positive effect on innovation adoption.*

### **3.4.3 Observability**

Rogers (1995, p. 16) defines observability as “*the degree to which results of an innovation are visible to others*”. Moore and Benbasat (1991) replaced Rogers’s concept, observability, with two new concepts: visibility and result demonstrability. Visibility is defined as “*the extent to which an innovation is perceived to be widely diffused in the relevant adoption setting*” (Plouffe et al. 2000, p. 68). Result demonstrability captures “*the degree to which the unique features and benefits of an innovation are readily discerned by the potential adopter*” (Plouffe et al. 2000, p. 68). Moore and Benbasat (1991) found that the perceived image and result demonstrability received higher values among adopters compared to nonadopters. These results were partly supported by Karahanna et al. (1999) since they found similarly significant differences concerning the perceived result demonstrability. If the observability is discussed in the form of visibility and result demonstrability, the hypotheses are:

*H3: High perceived visibility of an innovation has a positive effect on its adoption.*

*H4: High perceived result demonstrability has a positive effect on innovation adoption.*

#### **3.4.4 Compatibility**

Compatibility concerns the similarity of the innovation to an existing product it may eventually supplement, complement or replace (Zaltman et al. 1984). In other words, compatibility is defined as “*the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters*” (Rogers 1995, p. 15). Compatibility may also refer to compatibility with the values or norms of the potential adopters or may represent congruence with the existing practices of the adopter (Tornatzky and Klein 1982). Kim and Srivastava (1998) defined compatibility as the “goodness-of-fit” between a new technology and the needs of its potential users. Several researchers have found that compatibility has a positive effect on innovation adoption, e.g. Moore and Benbasat (1991), Karahanna et al. (1999), and Beatty et al. (2001). Based on these it is hypothesized that:

*H5: The more compatible the innovation is perceived the sooner it will be adopted.*

#### **3.4.5 Complexity**

Complexity of an innovation is critical to its acceptance. Rogers (1995, p. 16) defines complexity as “*the degree to which an innovation is perceived as difficult to understand and use*”. So generally speaking, the more complex the innovation is in terms of operating, the less rapid its acceptance will be. Zaltman (1984) discusses complexity on two different levels. Firstly, the innovation may contain complex ideas and secondly, the actual implementation of the innovation may be complex. Moore and Benbasat (1991) discussed complexity in terms of ease of use. The perceived ease of use is defined as the degree to which an individual believes that using a particular system would be free of physical and mental effort. The present study discusses the concept of perceived complexity, capturing also the definition of ease of use. The previous research

has shown that perceived complexity inhibits innovation adoption (e.g. Moore and Benbasat 1991, Karahanna et al. 1999, and Beatty et al. 2000). Concerning the perceived complexity, it is hypothesized that:

*H6: Perceived complexity of an innovation has a negative effect on innovation adoption.*

### **3.4.6 Trialability**

Trialability is “*the degree to which an innovation may be experimented with on a limited basis*” (Rogers 1995, p. 16). New ideas that can be tried on the installment plan will generally be adopted more quickly than innovations that are not divisible. An innovation that is trialable represents less uncertainty to the individual who is considering it for adoption, as it is possible to learn by doing. Previously, Moore and Benbasat (1991) and Karahanna (1999) have discovered a positive relationship between innovation adoption and perceived trialability. Thus, it can be hypothesized that:

*H7: Perceived trialability affects positively to innovation adoption.*

## 4 ORGANIZATIONS ADOPTING INNOVATIONS

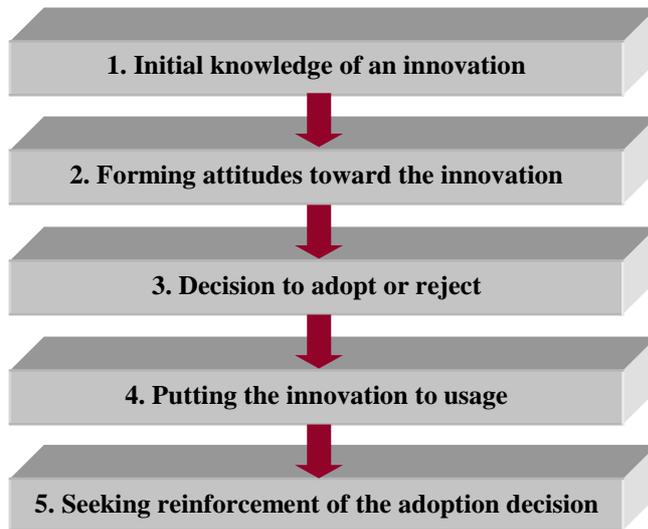
All types of organizations adopt innovations to respond to changes in their external and internal environments. Innovations come to organizations in two different ways: they are generated or adopted. For the adopting organization, the innovation process includes awareness of innovation, attitude formation, evaluation, decision to adopt, trial implementation and sustained implementation (e.g. Zaltman 1984, Rogers 1995, Frambach et al. 1998). The adoption process delineates how that outcome is assimilated in the adopting organization. The innovation can be a product or a service, an organizational process or an administrative program, a technology, or a policy, or a system related to organizational members. This chapter takes a look at the innovation decision and the stages of the adoption process that can be recognized. A link is drawn to the organizational buying behavior, since the adoption of innovation created outside the company involve a buying decision.

### *4.1 Innovation Decisions*

Zaltman (1984) classifies innovation decision in two categories: collective and authority innovation decisions based on the participation of the organizational members in the decision. Rogers (1995) adds another type of innovation decision to these categories: the optional innovation decision. In a collective innovation decision, the choices to adopt or reject an innovation are made by consensus among the members of the system. In authority innovation decision the choices to adopt or reject an innovation are made by a relatively few individuals in a system who possess power, status or technical expertise. In an optional innovation decision, the choices to adopt or reject an innovation are made by an individual independent of the decisions made by the other members of the system (see more Zaltman 1984, Rogers 1995).

Innovation decisions have always several stages that follow each other. Time is required for passage from one decision stage to another. Thus, time is suggested to influence the innovativeness of the decision unit. The length of the adoption process has obvious operational implications (Ozanne and Churchill 1971). A long decision period gives to a supplier more time to influence the decision-making process. Marketers of innovations

should then know in advance the kinds of firms that tend to take longer to make decisions. The innovation decision process leading to institutionalization of usage may be conceptualized as a temporal sequence of steps through which an individual faces five steps illustrated in Figure 4-1.



**Figure 4-1 Steps of Adoption From Initiation to the Full Acceptance of the Innovation (Zaltman 1984)**

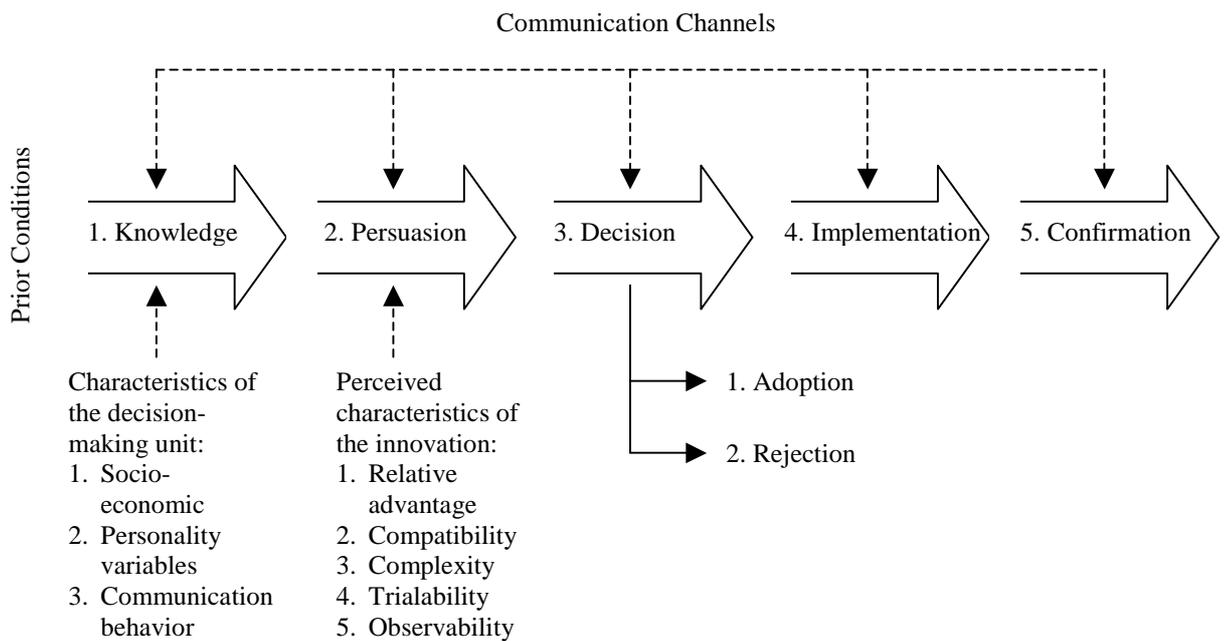
The adoption process is a sequence of stages a potential adopter of an innovation passes through before acceptance of a new product, service or idea (Frambach and Schillewaert 2002). Zaltman (1984) divides the adoption process to initiation and implementation stage. The adoption decision occurs between the initiation and implementation stage. In the initiation stage, the organization becomes aware of the innovation, forms an attitude toward it, and evaluates the new product; it encompasses awareness, consideration, and intention substages. Thus, the adoption decision is only the beginning of implementation.

## **4.2 Innovation Adoption Stages**

In organizations the decision-makers are faced with choices to innovate or not, to select different innovations, to use different methods for implementation and so on. The decision-making involves usually four main steps: (1) the generation of some subset of alternative courses of action available, (2) a set of consequences is attached to each alternatives, (3) there is some preference ordering in an attempt to rank the consequences of various alternatives, and (4) the decision makers select the first

alternative that meets some minimum standard of satisfaction with respect to each of the utilities that are being sought (Zaltman et al. 1984).

The innovation decision process is the process through which an individual or a decision making unit passes (1) from first knowledge of an innovation, (2) to forming attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision (Rogers 1995). This is illustrated in Figure 4-2.



**Figure 4-2 A Model of Stages in the Innovation Decision Process (Rogers 1995)**

### 4.2.1 Initiation Stage

The innovation process has main stages of initiation and implementation. Before an innovation can be adopted, potential adopters must be aware that the innovation exists and that there is an opportunity to make full use of the innovation in the organization. The initiation can happen both ways so that the awareness comes first or the knowledge of an innovation comes first (Zaltman et al. 1984). The awareness of an innovation can stimulate a need to adopt it, or a particular need can increase a search process that increases the awareness of an innovation.

The knowledge stage occurs when an individual or other decision-making unit (DMU) is exposed to an innovation's existence and gains some understanding of how it functions. There is two parts at the knowledge stage: awareness of the innovation and the need for innovation. Rogers (1995, p. 164) defines the need as "*a state of dissatisfaction or frustration that occurs when one's desires outweigh one's actualities, when wants outrun gets*". This means that an individual or other DMU can develop a need when he/she learns that an innovation exists and thus innovations can lead to needs and vice versa. The persuasion stage occurs when an individual or other DMU forms a favorable or unfavorable attitude toward the innovation (Rogers 1995). At the persuasion stage an individual becomes more psychologically involved with the innovation: he/she actively seeks information about the new idea.

Ozanne and Churchill (1971) discussed the activating factors that drive to the adoption process at the initiation stage. At first there existed capacity problems referring that the present equipment doesn't provide sufficient output. Equipment obsolescence would drive an organization to adopt an innovation, if the present machines or equipments are getting old and causing precision, dependability, and maintenance problems. The last activating factor that is relevant in the present study, is a new task or a problem, i.e. a customer requires the firm to perform a task beyond its present capabilities or a new task demands greater capabilities (Ozanne and Churchill 1971).

#### **4.2.2 Decision Stage**

The decision occurs when an individual or other DMU engages in activities that lead to a choice to adopt or reject the innovation. Therefore adoption is a decision to make full use of an innovation as the best course of action available. (Rogers 1995) Most adopters wont adopt an innovation without trying it first on a probationary basis in order to determine its usefulness in their own situations. The innovation decision process can just as logically lead to a rejection decision as to adoption, and each stage of the innovation decision process is a potential rejection point (Rogers 1995). The innovation decision period is the length of time required for an individual or organization to pass through the innovation decision process (Rogers 1995). Ozanne and Churchill (1971) pass by the decision stage, when they were studying purchase directing factors, which are influences that shape the final decision by pointing out the DMU toward a particular

version of innovation. These factors were (1) quick delivery, (2) cost / benefit comparisons, (3) special product attributes, (4) personal selling, and (5) past experience.

### **4.2.3 Implementation Stage**

At first, organizations implement innovations on a trial basis to determine if they are practical before commitment is made to the establishment of full-time department. If this has been successful, the implementation of an innovation will continue and the innovation becomes systematically used. (Zaltman 1984)

The implementation occurs when an individual or other DMU puts an innovation into use (Rogers 1995). The implementation means a beginning of concrete use of innovation and refers to the actual utilization of the innovation. The occurring problems at the implementation stage are more serious if the adopter is an organization. Usually a number of people are involved in the innovation decision process and the implementers are often different set of people from the decision makers. After the implementation, a point is reached at which the new idea becomes institutionalized and regularized part of the adopters' ongoing operations (Rogers 1995).

Kim and Srivastava (1998) discussed implementation as intraorganizational diffusion. Many times the intraorganizational diffusion is underscored by the fact that sales of most technological products with business applications to firms are based on additional purchases by the same organization, e. g. computers and software programs. Kim and Srivastava (1998) claim that an initial adoption of a product or technology under such circumstances is often a so called trial exercise, where a company buys the product in a small quantity to avoid technological risks related to new products or services. By capturing the dynamics and causes of the rate of intraorganizational diffusion, selling firms can predict future orders and focus on buying firms that have higher potential for product purchase (Kim and Srivastava 1998).

The confirmation occurs, when an individual or other DMU seeks reinforcement of an innovation decision already made, or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation. At this stage, the individual seeks to avoid a state of dissonance or to reduce it if it occurs (Rogers 1995).

In the case of innovative behavior, Rogers (1995) represents three situations where the dissonance reduction may occur:

- (1) When the individual becomes aware of the felt need and seeks information about an innovation to meet this need.
- (2) When the individual knows about the new idea and has a favorable attitude toward it, but has not yet adopted.
- (3) After the innovation decision to implement the innovation, when the individual secures further information that persuades him/her that he/she should not have adopted.

At the confirmation stage, there also exists discontinuance, which is the decision to reject an innovation after having previously adopted. Rogers (1995) divides discontinuance to replacement and disenchantment. A replacement discontinuance is a decision to reject an idea in order to adopt a better idea that supersedes it. Each new idea replaces an existing practice that was an innovation in its day. A disenchantment discontinuance is a decision to reject an idea as a result of dissatisfaction with its performance. The dissatisfaction can occur because the innovation is inappropriate for the individual and does not result in an adequate level of perceived relative advantage over alternative practice. The discontinuance of an innovation is one indication that the new idea may not have been fully institutionalized and routinized into the practice and way of life of the adopter at the implementation stage of the innovation decision process.

### ***4.3 How Does Innovation Adoption Relate to Organizational Buying Behavior?***

Webster and Wind (1972, p. 2) define organizational buying behavior as “*the decision-making process by which formal organizations establish the need for purchased products and services, and identify, evaluate, and choose among alternative brands and suppliers*”. Already based on the definition, some similarities can be found with the buying behavior and different stages of innovation adoption process. Organizational buying involves the determination of the need to purchase products or services, communications among those members of the organization who are involved in the purchase or will use the product or service, information seeking activities, the evaluation of alternative purchasing actions, and the working out of necessary

arrangements with supplying organizations. Organizational buying takes place over time, involving several organizational members and relationships with other firms and institutions (Webster and Wind 1972).

According to Webster and Wind (1972), the following characteristics are the reasons why organizational buying behavior is considered complex:

1. More people are usually involved in organizational buying situations and different people are likely to play different buying roles, as compared to adoption of individual consumers.
2. The persons occupying each role in a given organization are likely to change from one purchase to the next.
3. Organizational buying decisions often involve major technical complexities relating to the product or service being purchased.
4. Because of the technical complexities involved in organizational buying, decision require more information, undergo longer evaluations, and involve more uncertainty about the performance.
5. The longer time required for organizational buying indicates that there are significant lags between the application of marketing effort and obtaining a buying response.
6. All buying organizations differ from each other in ways that may require viewing each organization as a separate market segment.
7. The members participating in the buying function are normal human beings whose decisions and behavior are influenced by the both the task- and non-task related variables.

Organizational buying process is also more complex compared to the other organizational decisions (Webster and Wind 1972). First, most of the buyers' relations are horizontal relations with the users, which are of about the same formal rank in the overall organizational hierarchy. Second, formal authority over buyers can be in the hands of either a purchasing manager or an operating division manager. And third, a major part with the buyer's work is with people outside the organization. The buyers have substantially lower status than the engineers in the using departments (Webster and Wind 1972). The interest of research in field of organizational buying behavior has concentrated on the buying center, on organizational buying process and on the factors affecting organizational buying process (Wind and Thomas 1980).

### 4.3.1 Buying Situations

Robinson et al (1967) identified three different types of organizational buying situations: new task, modified rebuy and straight rebuy. In case of innovation adoption the buying situation usually is the new task, especially when discussing the radical innovations. The incremental innovation might be a new task purchase but the modified rebuy situations can as well come into question. Due to the different buying situations, Robinson et al (1967) created a buyclass model of organizational buying that defines the three major types of buying decision. These can be differentiated with three dimensions: the newness of the problem, the information requirements, and the consideration of new alternatives and thus this is the first model that takes innovations into account. The buyclass model and its dimensions are presented in Table 4-1.

**Table 4-1 The Buying Situations**

<b>Dimensions of difference</b>			
<i>Buying situation</i>	<i>Newness of the problem</i>	<i>Information requirements</i>	<i>Consideration of new alternatives</i>
New task	High	Medium	Important
Modified rebuy	Medium	Moderate	Limited
Straight rebuy	Low	Minimal	None

In the straight rebuy, the purchase focuses on the same product or service. The modified rebuy includes a change in the supplier, or change in the product of service. The buyclass model was extended to include product categories. The two-dimensional buying classification improves the usefulness of the model because the following factors can vary by the product category. First, level of expenditure and financial risk to buying organization isn't the same with every product categories. Second, the size and structure of the DMU can vary, and thirdly complexity and technical content of the decision-making process varies.

### 4.3.2 A Simple Model of Organizational Buying Behavior

The buying process in a formal organization usually involves several persons. Their decisions are influenced by other persons, by the organizational setting, which they operate, by the environmental constraints within which they and the organization

perform, and by their individual characteristics. Webster and Wind (1972) define these multiple influences on the buying decision with the equation:

$$B=f(I, G, O, E) \quad (1)$$

In other words, the buying behavior (B) is a function of individual characteristics (I), group factors (G), organizational factors (O) and environmental factors (E). These determinants can be either non-task or task related. Taking this into account, the equation on the multiple influences on the buying decision will be:

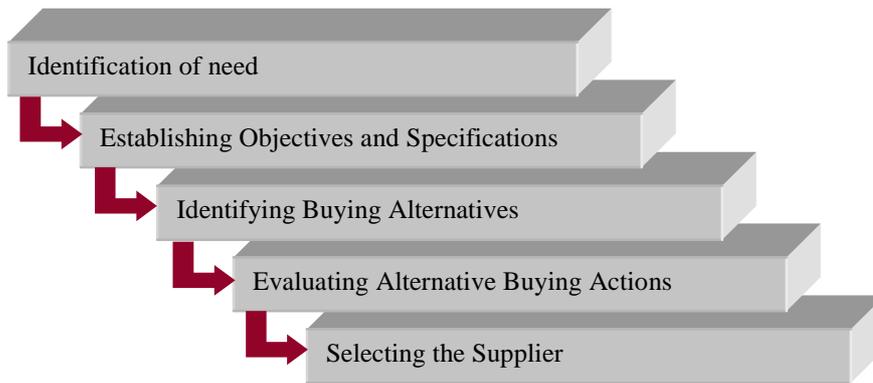
$$B= f(I_T, I_{NT}, G_T, G_{NT}, O_T, O_{NT}, E_T, E_{NT}) \quad (2)$$

The classification of the determinants involved in equation (2) is presented in Table 4-2.

**Table 4-2 Classification of Determinants in the Buying Behavior Model (Webster and Wind 1972)**

<i>Source of Influence</i>	<i>Task Variables</i>	<i>Nontask Variables</i>
Individual factors	Desire to obtain lowest price	Personal values
Interpersonal factors	Meeting to set product specifications	Off-the-job interactions among company employees
Organizational factors	Company policies with respect to product quality	Company politics regarding community relations
Environmental factors	Expected trends in business conditions	Political factors in an election year

Webster and Wind (1972) viewed the decision process, quite appropriate for innovation adoption, as consisting of four stages: (1) problem recognition, (2) assignment of buying authority and responsibility, (3) search process, and (4) choice process. Though every organization might have an eccentric set of buying decision processes, which again might vary from one purchase situation to another. The organizational buying decision process can be described in terms of a general model of organizational decision processes composed of five basic stages (see Fig.4-3). The specific nature, importance of and interrelations among these stages vary across organizations and buying situations, thus this model provides a good starting point for the understanding of the buying decision process (Webster and Wind 1972).



**Figure 4-3 A General Model of Organizational Buying Decision Process (Webster and Wind 1972)**

At the first stage, the need is identified, thus a buying situation is created when some member of the organization perceives a problem that can be solved through the purchase of a product or service. At the second stage, the need will be defined and specified for the purchase intention. At the third stage, the market is searched for available alternatives. Previously used information sources are approached and the sources of suppliers are searched. The fourth stage, the evaluating alternative buying actions, is the key stage in the buying decision process: the available alternatives are compared against the established criteria. At the last stage, the final decision is made concerning the supplier selection. In some situations where single criteria cannot be applied and where the disagreement about the ability of various potential suppliers to meet the specifications, the final decision about suppliers may reflect the relative power and influence of the various members of the buying group. (Webster and Wind 1972)

### **4.3.3 Buying Centers in Organization**

In organizations, decisions in buying situations are usually done by a small group of individuals, the buying center or the decision-making unit. Thus, the buying center making the decisions of innovation adoption is discussed more profoundly as an important part of innovation adoption. Webster and Wind (1972, p. 6) represented the following definition to buying center: *“Buying center consists of those individuals who interact for the specific purpose of accomplishing the buying task.”*

The buying center includes all the individuals involved in a purchasing decision. They also interact on the basis of the history of the group’s previous interactions and social experiences. Wind and Thomas (1980) argued that only little is known about the

composition of the buying center, the determinants of the specific buying center composition and changes in it, and the nature of influence patterns among its members. Choffray and Lilien (1980) used the buying center as a segmentation tool for industrial buying.

*The roles in the buying center*

The individuals involved in the buying decision have all their own roles. The persons interact on the basis of their particular roles in the buying process. According to Webster and Wind (1972), the roles are (1) influencers, (2) users, (3) deciders, (4) buyers, and (5) gatekeepers (Table 4-3). The roles can vary depending on the buying situation and the same individual may have a different role in different buying task.

**Table 4-3 Roles in the Buying Center**

<i>Roles</i>	<i>Role characteristics</i>
The user	The innovation is attached to daily work tasks
The buyer	Has the formal responsibility to contract for a good or a service
The influencer	Tries to affect the decisional outcome according to their beliefs
The decider	Makes the final decision among chosen alternatives
The gatekeeper	Controls the flow of information

Users are the ones that actually use the purchased products and/or services, and may have little or no buying authority and varying amounts of buying influence. Buyers have formal authority for selecting vendors and consummating the buying decision. The influencers do not necessarily have buying authority but can influence the outcome of the decision through the application of constraints. Deciders have formal authority and responsibility for deciding alternative brands and vendors. Gatekeepers control the flow of information into the buying group (Webster and Wind 1972). Krapfel (1985) referred gatekeepers as a boundary role person, who limits the information to other organizational members involved in the buying decision, and, thus they play an important role in the vendor’s choice processes. Individual factors include the individual’s age, income, education, professional identification, personality, and other psycho-socioeconomic characteristics. The different roles in the buying center differ from each other by the type and amount of information they receive.

The people in the roles of the buying center have all different influences. Kohli and Zaltman (1988) defined influence as the changes in purchase decision-related opinions and behavior of buying center members as a consequence of the individual's participation in the decision-making. The meaning of this measure is to tap the notion of how different the buying center members' opinions and behaviors would have been if the individual had not been involved in the decision-making. Sheth (1973) refers that the most important aspect of the joint decision-making process is the assimilation of information, deliberation on it, and the consequent conflict, which most joint decisions entail.

### *The Composition and Analysis of the Buying Center*

The number of individuals involved in the purchasing decision is one dimension to study the buying center, because the size of the buying center varies. According to Crow and Lindquist (1985) the number of members increases as the decisions become more complex. This means that there are more members in a new task purchasing decision than in a modified rebuy decision. The education of the buyer also influences the amount of individuals involved in the new task purchasing decision. When the education level increases, the average number of influencers in the buying center increases. Thus, the more educated the buyer, the greater the possibility of realization that others should be involved in the buying decision. Ozanne and Churchill (1971) found support to the common notion that buying groups with fewer participants reached the buying decision sooner.

The buying center can be analyzed due to the perceived value of the members in it. Crow and Lindquist (1985) chose to measure the perceived value of the buyer in the buying center. According to them the buyer has less influence in the new task purchasing decision. This can be explained by the fact that new tasks like innovations are more complex for the decision-making and thus, require more members and the influence will be divided between more individuals.

According to Choffray and Lilien (1980) available research about how to measure the role played by different decision participants in industrial buying decisions indicates that work on the subject should (1) be limited to a single product, (2) break the decision process into managerially meaningful areas of influence, and (3) recognize that the

measurement of the involvement of participants in the purchasing process leads to more reliable results than the measurement of their relative influence. They used a very simple method to measure the buying center. At first there was identified the persons involved in as certain buying situation and then the amount of persons involved in different decision stages was clarified with question: How many participants are involved in each phases? Altogether they solved who participated in which decision stages, and based on their measures they conducted market segmentation.

Kohli and Zaltman (1988) introduced a measurement of buying center influences. They suggested that ranking different members of the buying center according to their influence wasn't appropriate measure to use. The nature of the decision-making differs across stages of the decision making process so that influence processes are different in each procurement stage, and require correspondingly different measurement approaches. Kohli and Zaltman (1988) then selected the final evaluation and selection phase for the development of their measure of influence. They developed an item to assess the extent to which the final decision reflected the individual's views. They added more items to assess the extent to which the individual was responsible for the consistency between his views and the decisions.

After considering the issues related to buying center, it is hypothesized that:

*H8: The smaller the buying center, the sooner the decision to adopt innovations is reached.*

## 5 INNOVATION ADOPTER CATEGORIES

This chapter provides more information concerning the classification of innovation adopters. At first, the theory related to adopter categories is discussed. Then a look is given to adopter categories in organizational research. And at last the factors related to organizational innovativeness are discussed in order to form the basis on which the categories in the present study will be created.

### 5.1 Introduction to Innovation Adopter Categories

Chatterjee and Eliashberg (1990) identified three types of consumers: (1) consumers, who will adopt the innovation immediately after launch, (2) consumers, who will eventually adopt the innovation, given the required amount of information, and (3) consumers, who tend to drift away from adoption with additional information. Rogers (1995) developed the most widely used classification of innovation adopters. These categories are (1) innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards, and they are formed on the basis of the innovativeness of the adopters (see Fig. 5-1).

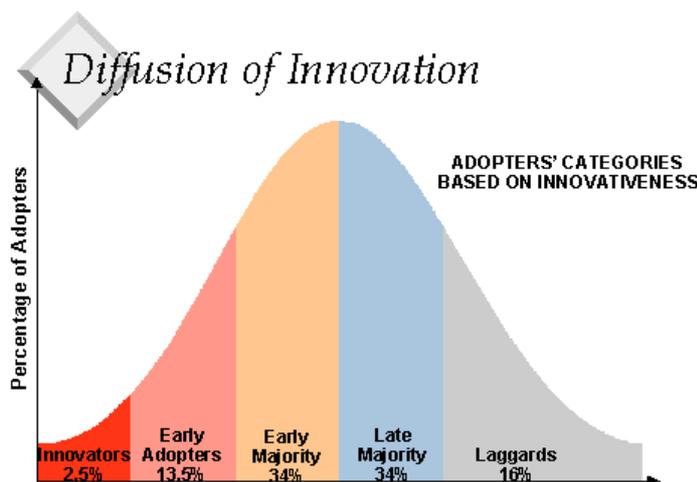


Figure 5-1 Innovation Adopter Categories Based on the Timing of Adoption (Klopfenstein, B. C. 1998)

According to Rogers (1995) the time when the adoption occurs, measures the innovativeness of a consumer. Based on his work, the first 2.5 percent of the adopters form the innovators' category. The next 13.5 percent of adopters cover the category of early adopters. The early majority is represented by the next 34 percent of the adopters and after them the following 34 percent of adopters belong to late majority. The last 16 percent of adopters are the laggards. These adopter categories are widely used in the consumer adoption behavior research, but usually only two or three adopter categories have been identified. It has also been proven that adopter categories are innovation specific, i.e. the percentages of adopters in each category might vary across different innovations (e.g. Mahajan et al. 1990).

When organizations are discussed as an adopting unit, it is common that early and later adopters, or adopters and non-adopters are compared. Very few studies were found that focused on innovation adopter categories targeted to business-to-business markets. Rogers (1995) described the characteristics of consumers in each innovation adopter category and Moore (1999) focused on high technology markets and describes psychographics for organizational members.

### **5.1.1 Innovators**

Venturesomeness is almost an obsession with innovators. The interest in new ideas leads them out of a local circle of peer networks and in to more cosmopolite social relationships (Rogers 1995). According to Rogers (1995), innovators need an ability to understand and apply complex technical knowledge, and they must also cope with a high degree of uncertainty about an innovation at the time of adoption. The innovator plays an important role in the diffusion process: That of launching the new idea in the system by importing the innovation from outside of the systems boundaries (Rogers 1995). This means that the innovators are gatekeepers in the system.

Moore (1999) considered innovators in business as technology enthusiasts that are gatekeepers for any new technology. According to his work, these adopters pose fewer requirements than any other group. They want to know the truth and if there is a technical problem with the innovation, they immediately want to discuss it with a knowledgeable person, who knows why the problems occur. This is something that the

marketer cannot always provide, but has to be aware that this kind of service is needed. These technology enthusiasts want to be the first to get the new stuff. The innovation costs should be as low as possible, because the enthusiasts want the new technology to be free or available at cost, because sometimes the adoption is a matter of budgetary funds.

### **5.1.2 Early Adopters**

Early adopters are more integrated part of the social system than the innovators, and thus Rogers (1995) names them as localites. According Rogers (1995) early adopters have the greatest opinion leadership in most systems and they serve as a role model for many other members of the social system. Thus, early adopters are considered to have a speeding effect on the diffusion process. The early adopter decreases uncertainty about a new idea by adopting it, and then conveying a subjective evaluation of the innovation to near-peers through interpersonal networks.

Moore (1999) described the early adopters as visionaries. Visionaries are rare breed of people, who have the insight to match an emerging technology to strategic opportunity, the temperament to translate that insight into a high-visibility, high risk project, and the charisma to get the rest of their organization to buy into that project. The visionaries have more funds and they operate as business oriented not technology oriented. Visionaries are willing to take risks in order to get order-of-magnitude return on investment. Both the enthusiasts and the visionaries are likely to communicate across industry boundaries in search of kindred spirits.

### **5.1.3 Early Majority**

The early majority adopts new ideas just before the average member of a system (Rogers 1995). The early majority interact frequently with their peer, but seldom hold positions of opinion leadership in a system. According to Rogers (1995) the innovation decision period is relatively longer than that of the innovator and the early adopter, thus they may deliberate some time before completely adopting a new idea.

Moore (1999) names the early majority in high tech markets as pragmatists, who represent the bulk of the market volume for any technology product. Pragmatists tend to keep a lower profile compared to visionaries. To market successfully to pragmatics, companies have to understand their values and work to serve them. Moore (1999) suggests that the goal of pragmatists is to make a percentage improvement. They don't want to take risks and if they are required to take a risk, they want to manage it very closely. Pragmatists are hard to win over, but they are loyal as they are once won. Pragmatists communicate more with others like themselves within their own industry. Competition is important to pragmatics, as they want to get the costs down. They want to buy from market-leaders, because they know that third parties will design supporting products or services around the market-leading product.

#### **5.1.4 Late Majority**

Rogers (1995) describes the late majority with a word skeptical. This means that late majority are skeptical and cautious toward innovations and they won't adopt until most others in their system have done so. Rogers (1995) suggests that adoption may be both an economic necessity for the late majority and the result of increasing network pressures from peers. Rogers (1995) also specifies that late majority has relatively scarce resources and thus the uncertainty related to the innovation must be removed before a member of late majority adopts an innovation.

Moore (1999) describes the late majority as conservatives. Conservatives are against discontinuous innovations. They stick with a solution that has been proven to fit for them. Their emphasis is on tradition rather than progress. They invest in the end of the technology life cycle, when the product is extremely mature, the market-share competition has made the prices low and the product themselves can be treated as commodities.

#### **5.1.5 Laggards**

Laggards are the last ones to adopt innovations. According to Rogers (1995) the decisions are often made in terms of what has been done previously, and these

individuals interact primarily with others who also have relatively traditional values. Their innovation decision process is relatively lengthy, with adoption and use lagging far behind awareness-knowledge of a new idea (Rogers 1995). Laggards aren't able to deal with uncertainty related to innovations, and Rogers defines their economic situation as precarious and thus extremely cautious in adopting innovations. Moore (1999) discusses laggards as sceptics. They try to point out that new systems don't deliver on the promises that were made at the time of their purchase.

## ***5.2 Adopter Categories in Organizational Research***

The attempt of the present study is to categorize organizations into adopter categories, whereas previous literature suggests only the division of adopters between non-adopters (e.g. Johne 1984 and Kuan 2001). Johne (1984) studied segmenting of high technology adopters. In his work, it is suggested that innovator companies tend to lead in the adoption of new advanced components when these are relevant to their marketing needs. As a segmentation tool, he used the measures of specialization, formalization, standardization, centralization and stratification. Zmud (1982) and Miller and Friesen (1982) found that early adopters have aggressive management strategies, frequency of communications with external sources, decentralized structure and perceptions of external environmental uncertainty. However, these studies only describe and separate adopters from non-adopters.

Only one study was found, that attempted to form all five adopter categories introduced by Rogers (1995). The study was conducted by Beatty et al (2001) and their target was to form adopter categories of companies adopting corporate website. They suggested that adopter categories would differ in their perceptions of general organizational attributes of the innovation, like perceived benefits, perceived organizational compatibility, perceived technical incompatibility, perceived complexity and perceived top management support. It is true that an organization will only choose to adopt an innovation if it perceives that doing so will provide greater benefits than existing methods and that the adoption will either resolve existing problems or provide new business opportunities. They also argued that organizations are more likely to adopt technology if they perceive that it is consistent with their culture, values and preferred work practices. They used adoption time to form the categories, but they failed to create

significant differences between the categories with the help of the perceived attributes. Their study included none of the structural variables included in other studies of organizational adoption behavior.

### ***5.3 Organizational Innovativeness***

Essential for the forming of organizational adopter categories is the measurement of innovativeness in organizations. Many times the organizational innovativeness is measured by determining the number of innovation adoptions. Subramanian and Nilakanta (1996) used three different measures for innovativeness: (1) the mean number of innovations adopted over time, (2) mean time of adoption of innovations, and (3) consistency of the time of adoption of innovations.

Damanpour and Gopalakrishnan (1998) introduced two measures for the innovativeness of organizations with the rate and speed of adoption. The rate of adoption relates to the extent of innovativeness of the organization. It reflects the magnitude of innovation, in other words, the number of different innovations the organization adopts within a given period. Organizations, which have high adoption rate, adopt innovations more frequently and more consistently. The speed of adoption relates to the timing of innovation, in other words the speed with which the organization adopts innovations after their first introduction elsewhere. This reflects to the responsiveness of an organization and its ability to adopt innovations quickly relative to its competitors within the industry. The speed of adoption is proposed to differ between early and delayed adoption.

Gauvin and Sinha (1993) approached the concept of innovativeness through three definitions: (1) a label assigned to those who are the first to adopt a new technology, (2) a force that increases the probability of being first to adopt new technology, and (3) a force that accelerates the adoption of new technology, over and above the relative opportunities for adoption. The first one is based on Rogers' (1995) definition of adopter groups. According to the definitions, the first 2,5 percent of the individuals who adopt the innovation are innovators (see ch.6). Though individual consumers and organizations aren't always comparable. Gauvin and Sinha (1993) suggested that if it would be possible to explain why an organization is an innovator, producers of

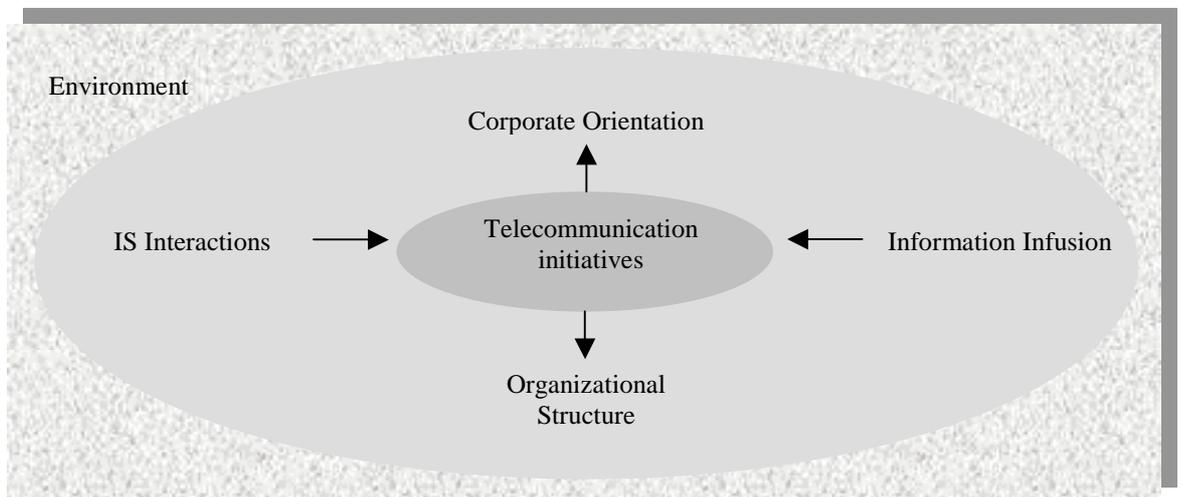
innovation could incorporate this knowledge in designing more effective strategies. The second point of view is based on Bass' (1969) definition that innovators are those who decide to adopt an innovation independently of the decisions of others. In his theory the innovators are contrasted with imitators, those who adopt an innovation as result of word-of-mouth. The importance of innovators will be greater at first but will diminish monotonically with time.

According to Chatterjee and Eliashberg (1990), the probability of adoption varies over time as the amount of available information increases, and across potential adopters reflecting variations in its relative value to potential users. A company can be innovative despite the fact that some innovations may be rejected. Companies simply have no need for a particular innovation. Gauvin and Sinha (1993) suggested that the meaning of innovativeness should be restricted to the process by which an organization reaches the decision to adopt an innovation. The meaning of innovativeness is suggested to be technology invariant, so if firms would be given equal opportunities, the innovative firms would adopt new technologies earlier.

In the present study the innovativeness of an organization has a special role. As the empirical part of the present study concentrates on the adoption of internet pages the innovativeness is considered through three dimensions: 1) awareness, 2) decision, and 3) implementation. Additionally, the relation of the company's establishment year has to be examined, since some of the companies might have been established after the internet was already launched.

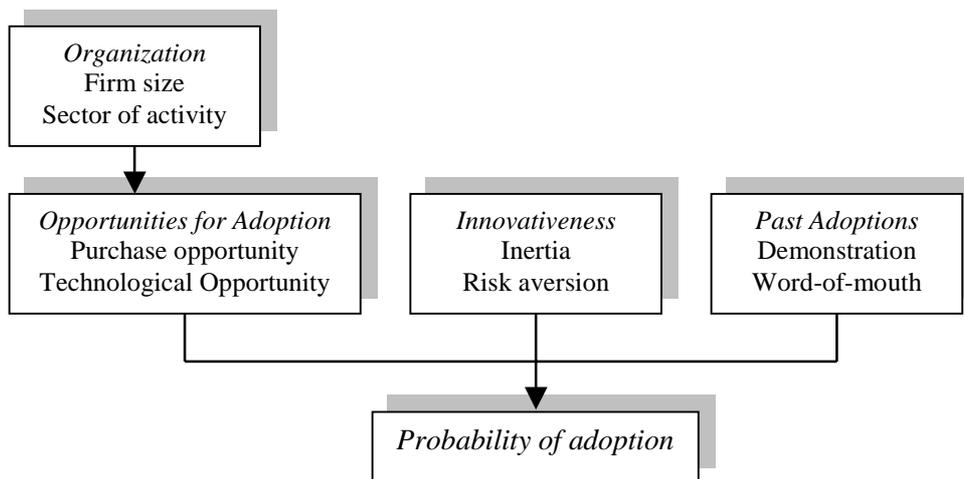
## 6 FACTORS AFFECTING ADOPTION OF INNOVATIONS IN ORGANIZATIONS

There exist several factors that have been found to affect innovation adoption in organizations. These factors are generally divided into structural characteristics of organizations, managerial influence, environmental factors and information processing, and in addition the innovation characteristics. Grover et al. (1995) presents five classes of factors that might influence on the adoption of telecommunications initiatives. As illustrated in Figure 6-1, these factors are related to: (1) the environment, (2) organizational structure, (3) information infusion, (4) corporate orientation, and (5) interaction of the information system group.



**Figure 6-1 Classes of Factors Influencing Telecommunications Initiatives. (Grover et al. 1995)**

Corwin (1975) presented six different factors that were found to be effective to innovation adoption: (1) the role of the administration, (2) the role of subordinates, (3) the personal status characteristics of administrators, (4) moral and financial support for change from outside the organization, (5) the community context, and (6) structural characteristics of the organization themselves. According to Gauvin and Sinha (1993), the probability of adoption has three determinants: (1) the opportunities for adoption, (2) the intrinsic innovativeness of potential adopters, and (3) the extent of past adoption. These dimensions are presented in Figure 6-2.



**Figure 6-2 The Determinants of Innovation Adoption. (Gauvin and Sinha 1993)**

The following discussion is based on these above introduced characteristics that have been found to effect the innovation adoption in organizations. More detailed introduction is at first given to organizational structure and its relationship with innovation adoption. Next, the focus will be on managerial issues, since managers tend to affect the organizational decision-making with their attitudes and strategies. Organizational environment naturally affects the adoption and different characteristics related to it are discussed. And as the adoption and diffusion are seen as a process continuously needing different types of information, the information behavior of the companies is discussed as the last factor affecting innovation adoption in organizations.

### ***6.1 Factors Related to Organizational Characteristics and Structure***

There are several different organizational characters that affect the adoption of innovation. The most diverse of these is the organizational structure and its various dimensions. The structural variables, that are influencing the innovation adoption in organizations, are: size, centralization, formalization, specialization, functional differentiation, and slack resources. From previous literature it can be said that entrepreneurial organizations are more innovative than conservative ones. However, the organizational factors have different influence on the adoption of innovations in different organizations (Damanpour 1991). All these are discussed below.

### 6.1.1 Size

Several researchers suggest that organizational size is a major determinant in innovation adoption through different reasons. As the size of an organization increases the more resources exist to expend in innovation adoption and implementation. Aiken and Hage (1971) supported the same aspect, as they saw that the size implies the availability of more resources. In the case of some innovations, which require large financial investments, the costs related to the innovation might be so high that adoption is possible for only larger firms. For innovation to be worth-while a firm must have sufficient control over the market to reap the rewards (Mansfield 1963). Larger organizations tend to be characterized by more conflict and uncertainty which can lead to change and they permit more flexibility and autonomy; larger organizations are more secure than smaller ones, and are in a better position to take the risks associated with innovation; and greater manpower and other resources are more likely to be available in larger than in smaller organizations (Corwin 1975). According to Frambach and Schillewaert (2002) larger organizations also feel greater need to adopt innovations in order to support and improve their performance. Frambach and Schillewaert (2002) remind that smaller organizations are more flexible and innovative, resulting in an enhanced receptiveness towards new products. Ettlie (1983) argued that smaller organizations are more innovative, because they are often starting out in a particular industry and establishing themselves initially through product innovation. Pugh et al (1963) discussed size as a contextual variable that is apt to be major determining factor of organizational structure. Geroski (2000) suggested that size of the firm is often used to explain organizational innovation adoption, because it is easy to observe.

As a segmenting variable the organizational size performs well, because the requirements for segmenting variables according to Kotler (1997) are that: (1) it must be measurable, (2) it must allow for accessibility to the segments created, and (3) the formed segment must be large enough to be profitable. When innovation is about to be introduced, some market research is done and the potential adopters are recognized and in the case of organizations, they are easy to recognize if the size is known.

Size has also some effects on the organizational buying behavior. Bellizzi (1981) found that the size is related to the buying center influences. The influence and power varies between the buying center members in organizations that have dissimilar size.

Moch (1977) discusses the size of an organization in two different ways. He suggests that size has both direct and indirect effects on adoption of innovation. Indirect effect of size might be traceable to its impact on organization structure. Size allows for differentiation in technology as well as organizations to more finely differentiate tasks and personnel, i.e. it is easier for larger companies to hire specialists and that way get access to knowledge of new ideas, practices and technical skills. Knowledge and skill are needed both to utilize innovations and for the prerequisites for adoption.

Different approaches exist to size – innovation adoption relationship. Size may have positive effects, non-significant effects or even negative effects on the adoption of innovations of an organization. The differences might occur when dealing with different types of organizations and innovations. Also the measure of size affects the relationship between size and adoption (Damanpour 1992). Relationship of organizational size and innovation adoption has been found to differ with different types of innovations and in different stages of the adoption process. The research conducted by Damanpour (1992) shows that the difference between types of innovation has a minor effect on the relationship between organizational size and innovation adoption. According to Dewar and Dutton (1986) the firm size was closely related to both administrative and technical innovation adoption. Overall, in the case of internet pages it is hypothesized that:

*H9: Larger organizations adopt innovations sooner than smaller organizations.*

Size can be considered in three different ways (Damanpour 1992). At first size can be considered either as an organizational factor or a contextual factor. If the organizational factor approach is used, the size can be measured by the number of employees or the size of assets. If the contextual factor approach is used, the size can be measured by the size of market, the community or the number of clients. Second, size might be measured using a direct measure or a log transformation measure, and third size can relate to a certain aspect of size - whether personnel, capacity, input or output volume, or financial resources. When Damanpour (1992) conducted a meta-analysis of studies dealing with the relationship of adoption and the size of an organization, he found that the size is more positively related to innovations in manufacturing than service. The association between size and innovation was stronger when studying the nonpersonnel measure than the personnel measure. Also the log transformation measure of size was found to be a little bit stronger than the raw measure of the size. A curvilinear relationship

represents better the relationship between size and innovation than the linear relationship.

### **6.1.2 Centralization**

Numerous researches have found that centralization of an organization affects the adoption of an innovation. Centralization is defined as “*the extent to which decision-making responsibility concentrates at the top levels of management*” (Grover et al. 1995, p. 37). Zaltman (1984) conceptualises centralization as the locus of the authority and decision-making in organizations. Thus, the greater the hierarchy of authority and less participation in decision-making, that exists in the organization, the greater the centralization and vice versa. Pugh et al (1963) listed four factors affecting centralization: (1) the location of the actual decision-making function at particular points in the authority structure, (2) the promulgation of rules for decisions, which limit the discretion of subordinates, (3) the frequency and thoroughness of review procedures and control systems, and (4) the legitimate availability of relevant information.

The effects of centralization on innovation adoption vary in different studies. In some cases the relationship between innovation and centralization has been found positive and in others negative. Partly the differences are dependent on the type of innovation in question and its relationship to key decision-makers (Kimberly and Evanisko 1981). Less emphasis on hierarchy and more participation in decision-making enhance information accessibility in the initiation stage of innovation diffusion, but strict channels of authority can reduce potential ambiguity and conflict in innovation implementation (Kim and Srivastava 1998). Moch (1977) suggests that it is possible that centralization facilitates the adoption of some types of innovations but inhibits the other. The study of Hull and Hage (1982) supported the common notion that a negative relationship exists between centralization and innovation.

Hage and Aiken (1967) used two methods to measure the degree of centralization. The first was related to the actual participation in organizational decisions and the other discussed the hierarchy of authority. Aiken and Hage (1971) measured the degree of centralization by asking staff members how often they participated in organizational

decisions regarding hiring of personnel, the promotion of personnel, the adoption of new organizational policies, and the adoption of new programs and services.

In the case of internet pages as a part of companies information technology, it can be considered that more decentralized organization becomes aware of the innovation sooner and due to the decentralization of decision-making the company has the ability to receive more effective information and based on this, make the decision sooner.

Thus, it is hypothesized that:

*H10a: Centralization has a negative impact on innovation adoption.*

*H10b: The larger the amount of different organizational levels taking part into different decision tasks, the sooner the innovations are adopted.*

### **6.1.3 Formalization**

Formalization is defined as “*the extent to which a firm uses rules and procedures for all situations*” (Grover et al. 1995, p. 37). Another more descriptive definition by Subramanian and Nilakanta (1996, p. 634) refers formalization as “*the existence of formal job descriptions, policies, and procedures for an organization’s personnel*”. Hage and Aiken (1967) defined that rules and regulations are important organizational mechanisms that may be used to insure the predictability of performance. Rules are also used as a mechanism of social control. According to Pugh et al. (1963) formalization distinguishes how far communication and procedures are written down and filed. With standardization Pugh et al (1963) refer to the standardization of procedures (e. g. decision seeking procedures, decision-making procedures, information-conveying procedures and procedures for operating or carrying out decisions) and roles (e. g. role definition, role performance measurement). This definition of standardization refers to the definition of formalization by Subramanian and Nilakanta (1996) and Hage and Aiken (1967). Thus, here the standardization is part of the formalization.

Hage and Aiken (1967) and Kim (1980) measured formalization with (1) the degree of codification specifying who is to do what, where and when; and (2) the degree of diligence exerted in enforcing these rules. Also Zaltman (1984) discusses formalization so that strict emphasis on rigid rules and procedures may prohibit organizational

decision makers from seeking new sources of information, and thus the probability to become aware of innovations decreases.

Aiken and Hage (1971) studied earlier the effect of formalization to innovation adoption in organizations. They examined whether organization have a rules manual, whether or not the organization has written job descriptions, and the number of regulations specifying who is to do what, when and where. They also measured the diligence with which the rules are enforced in the organization. They only found one aspect of formalization to affect negatively on the adoption, the presence of a rules manual. The present study hypothesizes, that:

*H11: Formalization inhibits innovation adoption.*

#### **6.1.4 Functional Differentiation**

Functional differentiation represents “*the extent to which an organization is divided into a number of subunits*” (Subramanian and Nilakanta 1996, p. 698). It has been proved that a positive relationship exists between functional differentiation and innovation (Hage and Aiken 1967, Moch 1977, Kimberly and Evanisko 1981). The positive relationship is generally based on the premise that a functionally differentiated organization creates multiple interest groups and multiple demands for elaboration of the core technology. Due to functional differentiation, an organization is able to reach information from variety of sources and thus able to become aware of innovations. The main hypothesis here is that functional differentiation facilitates innovation adoption, but if this is changed to correspond to the measurements, it can be hypothesized that:

*H12a: Higher amount of functional departments facilitates innovation adoption.*

*H12b: Higher number of differentiated product and service categories facilitates innovation adoption.*

*H12c: The more differentiated the product or service categories are the sooner the company adopts innovations.*

### 6.1.5 Specialization

Specialization of an organization is usually connected to innovation adoption. Literature uses also terms like complexity instead of specialization, but based of their definition they describe the same concept. Specialization refers to *the extensity and intensity of knowledge in the organization*. It represents the number of different specialties that can be found in an organization. Subramanian and Nilakanta (1996, p. 634) referred specialization as *“the existence of personnel with specialized skills in various functional areas of an organization”*. Zaltman (1984) suggest that complexity indicate diverse bases of expertise which results in the (1) identification of a wide range problems and (2) the availability of diverse kinds of information and perspectives regarding problem solving innovations. Complexity also implies a diversity of interest, which stimulates proposals for innovation as the various occupational groups, departments and strata seek to enhance or project their position vis-à-vis competitors. Structural complexity makes possible and may often require, the formal or informal assignment of special responsibilities for proposing organizational changes to particular roles and subunits (Aiken et al. 1980).

Kimberly and Evansiko (1981) suggested that employment of a variety of specialists provide access to broader knowledge of new ideas, techniques, and products and thus, a positive relationship exists with specialization and innovation. Through specialization, organizations have broader knowledge base in an organization and increased sprouting of new ideas. Hage and Aiken (1967) defined organizational specialization with three alternative indicators: (1) occupational specialties, (2) the length of training required by each occupation, and (3) the degree of professional activity associated with each occupation. The diversity in occupational backgrounds can then bring variety of sources if information to bear, which can facilitate awareness or knowledge of innovations at the initiation stage. Aiken and Hage (1971) found evidence that supports the common notion that innovation adoption is positively related to specialization. Also the same results were indicated in the earlier study of Hage and Aiken (1967). All together, the present study hypothesizes that:

*H13a: Higher specialization in organization facilitates innovation adoption.*

*H13b: The higher the share of highly educated employees the sooner the innovations are adopted.*

### 6.1.6 Slack Resources

Aiken and Hage (1971) presented two situations when innovation can occur. Firstly, organization may innovate as an attempt to reverse unsuccessful trend. Secondly, the innovation can be a slack innovation that is made when there are plenty of organizational resources available. Subramanian and Nilakanta (1996, p. ) refer slack resources as “*the existence of surplus resources that are available for experimenting with innovations*”. Slack resources enable organizations to experiment with new products and processes. Slack resources can be measured by net income, as it represents resources that are available for the development and adoption of innovations. Aiken and Hage (1971) measured slack resources as a change in resource base. The first measure was the increase in organization’s budget, and the other was whether or not the resource base changed during a certain period. Based of these measures their findings suggested that it takes increased finances in order for an organization to be innovative. The present study discusses slack resources as the availability of capital, employees, managers and materials. So, the hypotheses are:

*H14a: The availability of capital facilitates innovation adoption.*

*H14b: The availability of educated employees facilitates innovation adoption.*

*H14c: The availability of talented managers facilitates innovation adoption.*

*H14d: The availability of materials facilitates innovation adoption.*

### 6.1.7 Organizational Attitudes

All organizational members form attitudes toward an innovation. Zaltman (1984) indicates two dimensions that organizational members can exhibit about innovations. The first dimension is the openness to the innovation, which includes three components:

- (1) whether organizational members are willing to consider the innovation,
- (2) whether they are sceptical about the innovation, and
- (3) whether they feel the innovation will improve how the organization carries out its function.

The second attitudinal dimension is organization members’ perception of potential for innovation. This dimension focuses on whether organizational members perceive that (1) there is some capability within the organization for utilizing the innovation, (2) the

organization has had some success in the past in utilizing innovations, and (3) there is some commitment on the part of organizational members to working for the innovation and dealing with some of the potential problems that might arise as implementation is attempted. The receptiveness of an organization toward new ideas facilitates innovation adoption. Though Frambach et al (1998) didn't find any support for this. Kim and Srivastava (1998) referred organizational attitudes as general policies and strategies of an organization toward its environments, like technology sensitivity, resistance to change, attitude toward risk and openness to external information. According to Kim and Srivastava (1998), the more technically sensitive the organization is, the more successful the innovation in an organization will be. The resistance toward technological change is assumed to be negatively associated with the success of an innovation in an organization. These organizations that are reluctant to accept technological changes are less likely to encourage organization's members to use new technologies. The openness toward external information facilitates innovation adoption and its success, because that way the members of organizations are able to receive information about innovations and their effective usage. Concerning the organizational attitudes, it is hypothesized that:

*H15: The openness toward change in an organization has a positive effect on innovation adoption.*

### **6.1.8 Age of an Organization**

The age of an organization may also influence the degree to which new ideas and products are welcomed in the organization (Frambach et al. 1998). Kimberly and Evansiko (1981) studied the adoption of innovations in hospitals and found that the adopters of technological innovations are older. Thus the older companies would have broader experiences and more stable financial position. Also a study conducted by Baptista (2001) indicated that a positive relationship exists between company's age and innovation adoption. Thus, the present study hypothesizes that:

*H16: The older the organization, the sooner an innovation is adopted.*

## **6.2 *Managerial Influence***

The effect of company's management has to be taken into account in organizational adoption studies, since the managers are the ones making the decision. Besides the decision-making, managers and their attitudes and beliefs affect the whole organization. The management is thus in key position, when general attitudes are formed toward innovations and change. Also the managerial efforts and commitment in the adoption process affect the implementation and its fluency after the adoption decision is made. These aspects are considered more detailed below.

### **6.2.1 Innovation and Managerial Influence**

The managerial attitudes naturally influence the general attitudes towards change. The adoption of innovation in organizations depends on the general receptivity toward change held by the organization's members (Dewar and Dutton 1986). Thus, innovation adoption is very much dependent on the managerial influence toward it. According to Zmud (1984) innovation adoption requires reallocation of organizational resources, and this is impossible without the support of management. Managerial attitude and support is significant to both initiation and implementation stage of the adoption process. There exists a complex relationship between managerial attitudes and innovation as different attitudes toward the innovation exist in the upper management level. The effect of managerial attitudes toward change depends on whether the management maintains the power to make adoption decision (Dewar and Dutton 1986). According to Zmud (1984), managerial attitudes have stronger influence on technical innovations than on administrative innovations.

Gangon and Toulouse (1996) discussed two different types of managers: the entrepreneurial and administrative managers. According to them administrators make the decisions based on an analysis of existing data and need to go through certain amount of decisions before implementing innovations. The entrepreneurs are decision makers who operate confidently in an uncertain environment and they are guided by intuition rather than data analysis. Concerning the managerial influence it is hypothesized, that:

*H17: The more open and receptive the attitudes of the company's management toward innovations and change the sooner the innovations are adopted.*

*H18: The more committed the management team is in the adoption process; the sooner the innovations are adopted.*

*H19: Higher strategic orientation of the management toward innovations facilitates innovation adoption.*

### **6.2.2 Individual Characteristics of Managers**

Kimberly and Evansiko (1981) considered that four types of individual characteristics of managers would be important in innovation adoption i.e. the job tenure, cosmopolitanism, educational background, and the nature of organizational involvement of leaders. They argued that new leaders are likely to support and advocate innovations. New leaders are having fresh perspectives and unfettered by obligations to particular organizational constituencies (Kimberly and Evansiko 1981). Cosmopolitanism is associated with higher receptivity to innovations. The education type of the leader is suspected to affect the adoption decisions the way that the higher the level of education, the more receptive an individual is to innovation. Both the level and substance of education affect the receptiveness toward innovations.

*H20: Higher educated management team facilitates innovation adoption.*

*H21: The more fresher the management team is to the company, the sooner the innovations are adopted.*

### **6.3 Environmental Effects on Innovation Adoption**

Environment naturally effects the adoption of innovations. At first definitions of organizational environment are introduced. Then, the relationship between environment and innovation adoption is given a more detailed focus. Different characteristics arise from the environment that affect the adoption. These are defined here and the hypotheses are created.

### 6.3.1 Determining Organizational Environment

Zaltman (1984, p. 114) views the organization as an open system in continued interaction with its environment and then defines the organizational environment as “*the totality of physical and social factors that are taken directly into consideration in the decision-making behavior of individuals in the organization*”. Ackoff (1981) defines the environment as “*a system that is outside the organization, which influences the behavior and properties of the organization*”, and the environment itself is a complex system consisting of multiple types and dimensions.

**Table 6-1 Organizational Environment (Zaltman et al. 1984)**

Internal Environment	External Environment
<i>Organizational personnel component</i>	<i>Customer component</i>
(1) Educational and technological background and skills	(1) Distributors of product or service
(2) Previous technological and managerial skill	(2) Actual users of product or service
(3) Individual member’s involvement and commitment to attaining system’s goals	<i>Supplier component</i>
(4) Interpersonal behavior styles	(1) New material suppliers
(5) Availability of manpower for utilization within the system	(2) Equipment suppliers
<i>Organizational functional and staff units component</i>	(3) Product parts suppliers
(1) Technological characteristics of organizational units	(4) Labor supply
(2) Interdependence of organizational units in carrying out their objectives	<i>Competitor component</i>
(3) Intraunit conflict among organizational functional and staff units	(1) Competitors for suppliers
(4) Interunit conflict among organizational functional and staff units	(2) Competitors for customers
<i>Organizational level component</i>	<i>Socio-political component</i>
(1) Organizational objectives and goals	(1) Government regulatory control over the industry
(2) Integrative process integrating individuals and groups into contributing maximally to attaining organizational goals	(2) Public political attitude towards industry and its particular product
(3) Nature of the organization’s product /service	(3) Relationship with trade unions with jurisdiction in the organization
	<i>Technological component</i>
	(1) Meeting new technological requirements of own industry and related industries in production of product or service
	(2) Improving and developing new products by implementing new technological advances in the industry

The environment can be differentiated into internal and external environments (see Table 6-1). The internal environment consists of those relevant physical and social factors within the boundaries of the organization or specific decision unit that are taken directly into consideration in the decision-making behavior of individuals in that system. The external environment consists of those relevant physical and social factors outside the boundaries of the organization or specific decision unit that are taken directly into consideration in the decision-making behavior of individuals in that system. (Zaltman et al. 1984) According to Daft (1986), the external environment consists of two parts, which are 1) the administrative subenvironment and 2) the technical subenvironment (Table 6-2).

**Table 6-2 Elements of the External Environment.**

<i>The external environment</i>	
<i>The administrative subenvironment</i>	<i>The technical subenvironment</i>
The community context	Competitors
Resource granting agencies	Customers
Political and social factors	Suppliers
Government organizations	Technical groups

### **6.3.2 Environment and Innovation Adoption**

The environment has strong impact on an organization's ability to adapt and innovate. Innovation adoption is a means of changing the organization to facilitate the adoption to changing environments in order to sustain or increase organizational effectiveness (Damanpour and Gopalakrishnan 1998). The primal role of one type of innovation in an organization depends on (1) in which subsystem (technical or social) the knowledge is invested more and (2) in which subenvironment (administrative or technical) change occurs more frequently (Damanpour et al. 1989). Firstly, the knowledge could be invested more in the technical system than in the social system, depending on the nature of the organization. Secondly, organizations differentiate their structure to deal with different subenvironments, depending on the disparities in the external environment.

### **6.3.3 Environmental Characteristics Affecting Innovation Adoption**

A few major characteristics arising from environment have been showed to affect innovation adoption in organizations. These are environmental uncertainty, dynamism, and heterogeneity.

#### *Dynamism*

Miller and Friesen (1982) discovered that the dynamic and hostile environment raises the need for innovation adoption in organizations, and thus, these characteristics facilitate the adoption of innovations. Damanpour and Gopalakrishnan (1998) chose to focus on dynamism, because it has the closest relationship with organization's innovation capability. Dynamism can be divided into (1) extent of stability, which represents the extent to which events in the environment occur frequently and the amount or frequency of change in the environment, and (2) extent turbulence or predictability, which represents the extent to which events occur expectedly, for which a pattern could have been discerned in advance and reflects the fluctuation and unevenness of environmental change (Damanpour and Gopalakrishnan 1998). Four types of dimensions for environmental conditions can be created on the basis of above-mentioned division of dynamism. These dimensions are presented in Figure 6-4, and thus, it can be seen how the organizational environment affects the rate and speed of innovation adoption.

In stable and predictable environment, changes occur but the rate of change is slow and the pattern of change is predictable. The stability allows the organization to adopt innovations infrequently, although the rate of adoption is slow. Because the environment is predictable, the organizations are able to plan for and adopt innovations in an orderly and structured way. The speed of adoption isn't the most important issue and it might be very slow. According to Damanpour and Gopalakrishnan (1998), the possible organizations operating in this kind of environment are universities, colleges, hospitals, container manufactures, gas and electric utilities and food packaging companies. The current strategies, technologies and administrative systems might face some modifications when organizational change occurs.

		Environmental Stability (Rate of environmental change)	
		<i>Stable (low)</i>	<i>Unstable (high)</i>
Environmental predictability (Regularity of environmental change)	<i>Predictable (high)</i>	<b>1) Stable, predictable</b> <u>Innovation adoption</u> Rate: low Speed: low <u>Innovation Type</u> Technical Incremental <u>Innovation source</u> Initiative <u>Organizational form</u> Mechanistic Hierarchy	<b>3) Unstable, predictable</b> <u>Innovation adoption</u> Rate: high Speed: moderate <u>Innovation Type</u> Technical and administrative Incremental and radical <u>Innovation source</u> Initiative and incubative <u>Organizational form</u> Organic Clan
	<i>Unpredictable (low)</i>	<b>2) Stable, unpredictable</b> <u>Innovation adoption</u> Rate: low Speed: Fast <u>Innovation type</u> Technical Incremental and some radical <u>Innovation source</u> Initiative and acquisitive <u>Organizational form</u> Mechanistic Market	<b>4) Unstable, unpredictable</b> <u>Innovation adoption</u> Rate: high Speed: fast <u>Innovation type</u> Technical and administrative Incremental and many radical <u>Innovation source</u> Acquisitive and incubative <u>Organizational form</u> Organic Adhocracy

**Figure 6-3 Four dimension of environmental conditions (Damanpour and Gopalakrishnan 1998)**

In stable and unpredictable environment, the rate of changes is low, but the patterns for changes are unpredictable. Innovating isn't frequent and continuous and the rate of innovation is very low. Organization cannot make plan for innovations, because the environment is unpredictable. Due to this an organization must be able to adopt innovations fast if a change in the environment requires, in order to maintain their competitive position. Damanpour and Gopalakrishnan (1998) give the following organizations as an example: fashion clothing, advertising companies, personal computer manufacturers, mail-order retailing and music industry.

The innovations adopted in stable and unpredictable environment are incremental and technical. The unpredictable change occurring in the environment makes the companies also adopt radical innovations. Thus, the innovation speed has to be high. An organization in these environmental conditions can benefit from the ability to initiate radical innovations and from the successful assimilation of them into the organization. If the source is imitative, the organization could reverse engineer and copy an innovation that is already being used in another organization. If the source is acquisitive, organizations acquire innovations entirely develop elsewhere in order to respond more quickly to an unpredictable environmental change. These environmental conditions require from organizations an ability to make fast decisions and react to environmental demands. (Damanpour and Gopalakrishnan 1998)

In unstable and predictable environment the rate of change is high, but the pattern of change is predictable. Organizations are allowed to plan innovations, but have to notice that the plans are complex and they should be very flexible. The rate of adoption is high and the speed to make decisions to adopt innovations is moderate. Example organizations in this field are electronic firms, airlines, film industry, hospitals, oil and chemical companies and many financial services firms. (Damanpour and Gopalakrishnan 1998) Organizations adopt a balanced rate of incremental and radical innovations. The responses to environmental changes are controlled, based on existing knowledge, technologies and structure. Also both technical and administrative innovations are adopted. To maintain the high rate of adoption of both technical and administrative innovations, the innovation process has to work effectively and efficiently to enable the organization to initiate and implement innovations regularly, thus the decisions for innovation have to be made quickly and frequently.

Unstable and unpredictable environment changes frequently and irregularly. The rate of innovation is high and the speed of adoption is fast. Incremental and radical innovations are then needed to keep along with competitors. Organizations must have capability to change continuously and to absorb the change quickly. Damanpour and Gopalakrishnan (1998) suggest the following organizations to this category: telecommunication companies, biogenetic engineering companies, software design companies, specialty chemical companies, supercomputer manufacturers and research-oriented pharmaceutical firms. The organizations use incubative and acquisitive sources for radical innovations. Acquisitive source helps the organization to respond quickly to

environmental demands and to acquire innovations to pursue new business opportunities. The incubative source reflects to organization's commitment to internally create innovations, so they can be in the forefront of new product and technologies in order to be different from their competitors. Thus, it is here hypothesized that:

*H22: Dynamic environment facilitates the adoption of an innovation.*

### *Environmental Uncertainty*

Environmental uncertainty means that decision makers do not have information about environmental factors, and they have difficulties predicting external changes (Daft 1986). Rogers (1995) defines uncertainty as the degree to which a number of alternatives are perceived with respect to the occurrence of an event and the relative probability of these alternatives, thus uncertainty implies a lack of predictability, of structure and of information. Uncertainty increases the risk of failure for organizational actions, and makes it difficult to compute costs and probabilities associated with decision alternatives. Uncertainty stimulates a change in strategy or policy, and that ultimately leads to innovation (Ettlie 1983). Grover et al. (1995) concentrated mainly on the uncertainty, when they discussed the environmental factors affecting the adoption of telecommunication initiatives. According to them, the increasing uncertainty in the environment facilitates a greater adoption of innovations; in other words, uncertainty spurs the need to innovate. Grover et al (1995) expected adopters to be in relatively more uncertain environments compared with non-adopters. Ettlie (1983) found that uncertainty promotes aggressive technology policy and that aggressive technology policy facilitates innovation adoption. Daft (1986) suggests that organizations response to environmental uncertainty due to organizational differentiation and integration. When the external environment is complex and rapidly changing, organizational departments become highly specialized to handle uncertainty in their external sector. In the present research it is hypothesized, that:

*H23: More uncertain environment facilitates the adoption of innovations.*

### *Heterogeneity*

Daft (1986) referred environmental complexity to heterogeneity, or the number of external elements that are relevant to organization's operations. Organizations operating in many different markets are likely to learn from their broad experience with customers

and competitors and thus the greater the diversity of the organization, the greater the probability that innovations will be proposed and the members of the organization will conceive major innovations (Miller and Friesen 1982). Here it is hypothesized, that:

*H24: More heterogeneous environment facilitates innovation adoption.*

#### **6.3.4 Competition**

Competition is generally expected to increase the adoption of innovation in order to survive along the competition. An organization may feel pressure toward adopting an innovation when it sees more and more organizations in the same industry adopting a certain innovation and therefore feels the need to adopt in order to remain competitive. In highly competitive markets, innovation adoption may be necessary to maintain one's market position. Non-adoption of an innovation that is adopted by others in such an environment may result in competitive disadvantage. (Frambach and Schillewaert 2002) Also according to Mansfield (1961) the rate of imitation is faster in more competitive industries. Robertson and Gatignon (1986) proposed that competitive environment among potential adopters is important in determining receptivity to innovation, even though competitive variables account a smaller share of the variance than innovation characteristics and adopter category factors. Based on this, it is hypothesized that:

*H25a: The higher the rate of competition in the environment, the sooner the innovations are adopted.*

*H25b: The higher the amount of competitors the sooner the innovations are adopted.*

#### **6.3.5 Cooperation**

Aiken and Hage (1971) suggested that interorganizational relationships are positively related to innovations adoption. Due to interorganizational relationship an organization has greater propensity of reaching new ideas and information. Thus, the spur of innovations becomes greater. Aiken and Hage (1971) measured organizational interdependence with the amount of joint programs of organizations during a certain time period. With this they found proof that there existed a strong relationship between organizational affiliation and innovation adoption. These affiliations are important for

innovation of the infusion of new ideas and also for the implementing new programs and services. It can be hypothesized that:

*H26: Cooperation has positive impact on innovation adoption.*

## **6.4 Information Behavior and Communication**

Zaltman et al (1984) argued that the development and diffusion of innovations can be seen as a process composed of several phases and each phase is characterized by different types of decisions and problems of coordination as well as by different patterns of communication. A successful adoption process is often characterized by extensive communication (see ch. 4, Figure 4-2). The present chapter discusses some aspects of information behavior and its relations to innovation adoption.

### **6.4.1 Information and the Environment**

Information processing and gathering affects the timing when organization first becomes aware of an innovation (e.g. Rogers 1995). Information infusion describes the extent to which information and information technologies are acquired and used by the firm (Figure 6-1). Some companies are involved in more information-related activities than others. This is because of the companies' fundamental nature or their choice. Grover et al (1995) use two factors describing this concept: information intensity and information scanning. Information intensity refers to the extent to which information technologies are used for various activities of the firm. Information scanning refers to the extent to which technological information is actively acquired by the firm. Miller and Friesen (1982) defined scanning as the recognition of needs and demands of organization's external environment. Scanning supports the innovation in conservative organizations as it points out changing customer desires and buying patterns. Scanning is proved to have opposite relationship for entrepreneurial organizations. Information can reveal that no innovation is needed for problem solution or for the increase of effectiveness.

## 6.4.2 Information and the Adoption Decision

Information processing affects the time that is used for the adoption decisions and in the different stages of decision-making process. In several phases of the process information is needed to proceed. After the initiation of a problem or need, information is gathered for the possible solutions, and after the solutions is selected, the information is needed about the possible vendors. The innovation decision process is essentially an information seeking and information processing activity in which the individual is motivated to reduce the uncertainty about the advantages and disadvantages of an innovation (Rogers 1995). At the first stage of innovation decision, awareness-knowledge is information that an innovation exists. At this point information is also gathered concerning how to use the innovation properly. There exists also principles-knowledge consisting of information dealing with the functioning principles underlying how the innovation works (Rogers 1995). Though it is usually possible to adopt an innovation without principles-knowledge, but the danger of misusing the new ideas is greater and discontinuance may result.

Rogers (1995) discusses communication channels, divided to mass media channels and interpersonal channels. Mass media channels are means of transmitting messages involving a mass medium, such as radio, television, newspapers, and so on, that enable a source of one or few individuals to reach an audience of many. According to Rogers (1995) mass media can: (1) reach a large audience rapidly, (2) create knowledge and spread information, and (3) lead to changes in weakly held attitudes. Interpersonal channels instead involve face-to-face exchange between two or more individuals. Interpersonal channels have greater effectiveness in dealing with resistance or apathy on the part of the communicatee. According to DeCanio and Watkins (1997) the ideal situation of information processing from innovation adoption point of view is when everyone in the organization are connected with everyone. This means that if one person adopts an innovation, it will be immediately transmitted to all other members of the organization, who will then all adopt the innovation. The present study hypothesizes that:

*H27: Active information behavior of the company facilitates innovation adoption.*

### 6.4.3 Communication in the Organization

Rogers (1995, p. 5) defines communication as “*a process in which participants create and share information with one another in order to reach a mutual understanding*”.

Communication has four major characteristics: formalization, frequency, centrality and diversity (Ebadi and Utterback 1984). Formalization of communication in organizations can lead to the decreasing amount of communication between the members of an organization. This will have negative impact in problem solving situations. In the case of innovation adoption, the formality of communication diminishes the information flow and thus affects negatively to the adoption of innovations in organizations. This can be said through analogy from a research of Ebadi and Utterback (1984), proving that communication formality among investigators in projects had negative impact on problem solving.

According to Ebadi and Utterback (1984) communication frequency has positive impact on problem solving. Innovations can be adopted to solve a problem in organizations. The communication frequency is significant in the initiation stage, when the need for innovation or a problem is recognized. The communication should be frequent also when the possible solutions are created and compared. The communication centrality makes it possible to receive more relevant information during the decision making process. This has also been proved by Ebadi and Utterback (1984). The members involved in the buying center have the same objects and in this kind of situation the centrality of communication shares the information among members having the same interest and more relevant information is obtained. If the communication is diverse, more irrelevant information will be involved in the decision-making. Though both high diversity and high centrality include relevant and irrelevant information, the amount of them differs. So, the diverse communication has more irrelevant information than the central communication.

Also Aiken and Hage (1971) discussed the intensity of communication. They divided the organizational communication in two categories: scheduled communication and unscheduled communication. The measures created for scheduled communication were (1) the number of permanent committees in the organization and (2) the number of committee meetings per month. Aiken and Hage (1971) argued that innovative organizations should have more committees and more frequent committee meetings.

The unscheduled communication was measured with all non-scheduled verbal communications each week. There exists interdepartmental communication and intradepartmental communication. The departmental communication was then measured whether it happened with someone at higher level, on the same level or at lower level. These formed six dimensions (Table 6-3) and in each were measured to amount of weekly non-scheduled communication.

**Table 6-3 Dimensions of Communication**

Different dimensions of communications	
Different department, higher level	Same department, higher level
Different department, same level	Same department, same level
Different department, lower level	Same department, lower level

According to Aiken and Hage (1971) there exists more upward communications in innovative organization and the communication dimension is both intradepartmental and interdepartmental. The innovative organizations had more communications upward in other departments and less downward intradepartmental communications.

Concerning organizational communication it is hypothesized that:

*H28: Active information behavior among the employees facilitates innovation adoption.*

*H29: Formal communication in the organization inhibits innovation adoption.*

#### **6.4.4 Marketing Information**

Supplier marketing activity can significantly influence the probability that an innovation will be adopted by an organization. Frambach and Schillewaert (2002) introduced three important factor of marketing activity: (1) targeting of the innovation, (2) its communication, and (3) the activities that the supplier undertakes to reduce the perceived risk of the potential customer. Careful and specific targeting of an innovation towards selected potential adopters can facilitate acceptance in the market. Potential adopters such as innovative organizations and individuals, heavy users of the preceding technology may be more receptive to the innovation than others. Supplier communication creates awareness of an innovation and also influence on potential customer's perceptions of the innovation (Frambach and Schillewaert 2002). The

adoption of innovation can be stimulated by reducing the risk associated with early adoption of an innovation, including implementation risk, financial risk and operation risk. In addition to correct information spreading the trial period of an innovation is important. On the other hand suppliers in the business field can increase the probability of their innovation's adoption through spreading information about it. Thus the extent to which potential adopters have processed information on the innovation is highly dependent on the degree to which suppliers have been involved in providing information on the innovation (Frambach et al. 1998). The present study hypothesizes:

*H30: The higher the amount of different suppliers contacted, the sooner the innovations are adopted.*

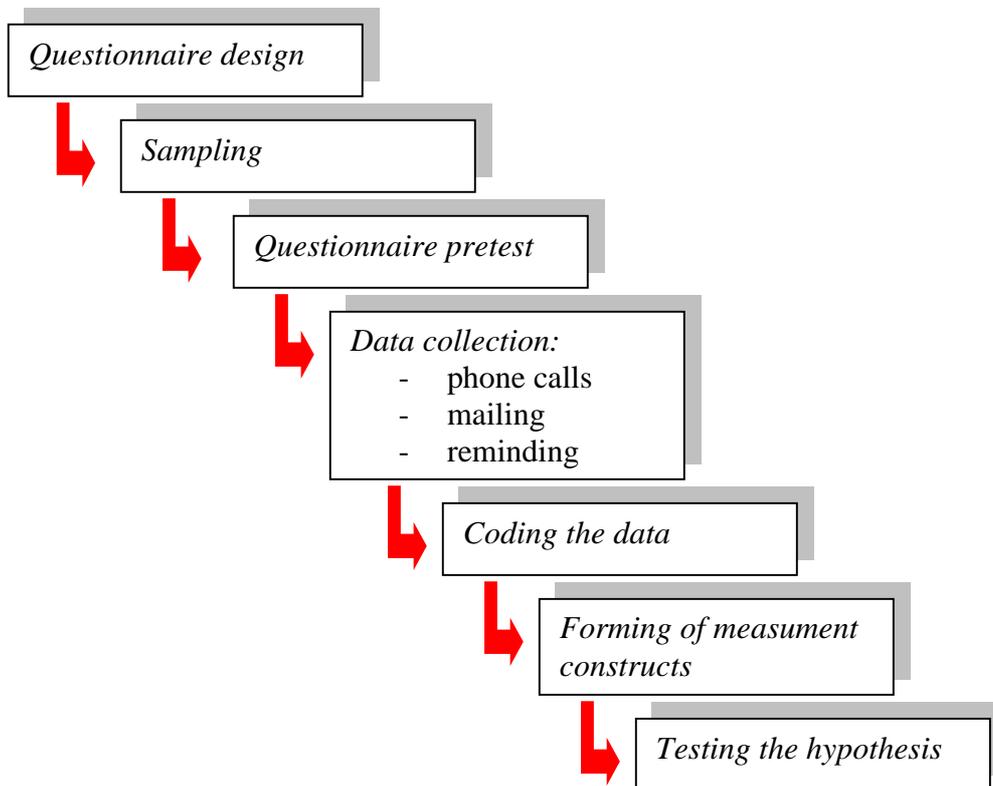
*H31: The higher the amount of information received from different sources the sooner the innovation adopted.*

## **7 THE HISTORY OF INTERNET**

The empirical part of the present study discusses the adoption of corporate websites and thus a short look is given to the background of the internet. The U.S. Department of Defense laid the foundation of the internet roughly 30 years ago with a network called ARPANET. But the general public didn't use the Internet much until after the development of the World Wide Web in the early 1990s. (Microsoft Corporation 2001) The first proposal for such a system was made at CERN by Tim Berners-Lee in 1989, and further refined by him and Robert Cailliau in 1990. By the end of that year, prototype software for a basic system was already being demonstrated. To encourage the adoption of the system, it was essential to offer access to existing information without having to convert it to an unfamiliar format. This was done by providing an interface to the CERN Computer Centre's documentation and help service, and also to the familiar Usenet newsgroups. All this information immediately became accessible via a simple WWW browser, which could be run on any system. (CERN 1997) Early on, the internet was limited to noncommercial uses because its backbone was provided largely by the National Science Foundation, the National Aeronautics and Space Administration, and the U.S. Department of Energy, and funding came from the government. But as independent networks began to spring up, users could access commercial Web sites without using the government-funded network. By the end of 1992, the first commercial online service provider, Delphi, offered full internet access to its subscribers, and several other providers followed. (Microsoft Corporation 2001)

## 8 DATA COLLECTION

The empirical study is based on a quantitative methodology and consists of several parts described in Figure 8-1.



**Figure 8-1 Phases of the Empirical Study**

The first parts of the empirical study that relate to methodological issues are discussed briefly in this chapter, beginning from the questionnaire design, sampling and pretesting. After these, the data collection is discussed.

### 8.1 Questionnaire Design

Structured-undistinguished questionnaires are most commonly used in marketing research. With them questions are presented with exactly the same wording, and exactly the same order, to all respondents. And typically the responses as well as the questions are standardized. The reason for standardizing them is to ensure that all respondents are replying to the same question. (Churchill 1995) This type of questionnaire is easy for

the respondent to fill out, and easy for the researcher to tabulate and analyze. In addition, the alternative responses often help to make the question much clearer. If the questions have fixed alternatives, they can be dichotomous, multichotomous, or scales.

Multichotomous question is a fixed alternative question, and respondents are asked to choose among several alternatives that most closely corresponds to their position on the subject. Dichotomous questions have fixed alternatives, but there are only two alternatives listed. Scale questions can measure how frequently some occasion happens, how much the respondent agrees or disagrees with the question etc. Scale measures are easy to apply, if the alternatives are the same in numerous questions, this way instruction would only need to be given once at the beginning. (See more in Churchill 1995)

The present study applies mainly fixed-alternative questions. Most of the questions are designed to scales, but some multichotomous questions are included. The questionnaire was mainly designed with the help of questions obtained from previous literature. The questionnaire was divided into seven parts based on the hypotheses: (1) background information concerning the respondent, (2) organizational characteristics, (3) innovation characteristics, (4) issues related to the buying decision, (5) information behavior, 6) management team and innovation adoption and (7) environmental characteristics.

**Table 8-1 Sources Used for the Creation of Measurements**

<b>Measurements</b>	<b>Measurement source</b>
<i>Innovation characteristics</i>	(Moore 1999), (Karahanna et al. 1999), (Davis 1985), (Kuan and Chau 2001), (Lynn et al. 2002), (Plouffe et al. 2001), (Walczuch et al. 2000)
<i>Centralization</i>	(Aiken and Hage 1971), (Grover et al. 1995), (Hage and Aiken 1967), (Hull and Hage 1982)
<i>Formalization</i>	(Grover et al. 1995), (Hage and Aiken 1967), (Hull and Hage 1982)
<i>Functional differentiation</i>	(Aiken et al. 1980), (Miller and Friesen 1982)
<i>Specialization</i>	(Aiken and Hage 1971), (Subramanian and Nilakanta 1996)
<i>Slack resources</i>	(Miller and Friesen 1982)
<i>Organizational openness</i>	(Zaltman et al. 1984),
<i>Managerial influence</i>	(Sultan and Chan 2000), (Zaltman et al. 1984)
<i>Environmental characteristics</i>	(Grover et al. 1995), (Miller and Friesen 1982)
<i>Information behavior</i>	(Frambach et al. 1998), (Grover et al. 1995), (Miller and Friesen 1982), (Sultan and Chan 2000)

Table 8-1 gives a look at the measurement constructs applied in the present study, capturing the main sources for the measurement scales. Some of measurement constructs could be directly applied from the literature, but some parts of the measures were created in the present study based on the literature review. The final questionnaire (in Finnish) is in Appendix 1.

## **8.2 *Sampling***

In designing the sample, the researcher must specify 1) the sampling frame, 2) the sample selection process, and 3) the size of the sample (Churchill 1995). The sample frame refers to the list of population elements from which the sample will be drawn. The sample selection process requires the form of the sample to be specified.

In the present study, the sample was collected from a Finnish Bluebook database. The target population under investigation was the traditional manufacturing industry i.e. metal industry, food industry, and construction industry. All together the sample covered 443 companies.

## **8.3 *Selection of the Data Collection Method***

Different methods are available for collecting quantitative data including personal interviews, telephone interviews, a mail survey, a web survey and an e-mail survey. The interviews were rejected as a data collection method due to the cost and timing factors. Web-survey and e-mail survey were also rejected, due to technical reasons, and the fact that they would be more difficult to personalize. So, the method most appropriate for the present study was the traditional mail survey.

Churchill (1995) lists some advantages related to mail surveys: 1) it may be the only method able to reach respondent, 2) it does not subject to interviewer bias, 3) respondents work at their own pace, 4) it assures anonymity of respondents, 5) wide distribution is possible, 6) best for personal and sensitive questions, and 7) generally the least expensive. Some of the disadvantages mentioned by Churchill (1995) were: 1) very little control in securing response from specific individual, 2) cannot secure

response from illiterates, 3) cannot control speed of response, 4) researcher cannot explain ambiguous questions, and 5) it is difficult to change the sequence of the questions.

In the present study, the respondents were decision-makers in companies, and thus the mail survey may have been the only way to reach the respondent. This way the respondent could fill out the questionnaire anywhere and responding wasn't tied to time and place, like in the interviews for example. Also the personalization and the cost factors supported the mail survey. The above-mentioned disadvantages of the mail survey were taken into account as the survey was designed. The companies were asked to fill out the company name still granting the anonymity of the response. Contacting the companies at first with telephone, and searching appropriate respondent that way from each company eliminated illiterate respondents. The response time was controlled with reminder mailing, after two weeks from the first mailing. The pretesting was conducted in order to find out what questions were ambiguous and whether the sequence of the questions was correct.

#### ***8.4 Pretesting***

The purpose of the pretest is to ensure, that the expectations of the researcher in terms of the information that will be obtained from the questionnaire, are met (Aaker and Day 1990). The pretest can be used to assess both individual questions and their sequence (Churchill 1995). Because a pretest is a pilot run, the respondents should be reasonably representative of the sample population (Aaker and Day 1990), and similar to those who will be used in the actual study (Churchill 1995).

Churchill (1995) suggests that the pretest should be conducted as two stage process. The first pretest should be done by personal interviews regardless of the actual data collection method. This way the interviewer can watch to see if people actually remember the data requested of them, or if some questions seem confusing (Churchill 1995). The personal interviews should reveal some questions, in which the wording could be improved or the sequence changed. The second pretest should be done in the exact same way as the final survey. This should uncover problems unique to the mode of survey. The responses that result from the pretest should be coded and tabulated. The

tabulation of pretest responses can check on our own conceptualization of the problem and the data and method of analysis necessary to answer it (Churchill 1995). Aaker and Day (1990) suggest that even if the field survey is to be done by mail, the pretest should be conducted with a personal or telephone interview to get direct feedback on problems.

The main purpose of the pretesting in the present survey was to confirm and check the translation in Finnish, since the questionnaire was mainly designed based on previous studies conducted in English, and used almost completed measurement scales. Also the structure of the questionnaire was under consideration. Altogether, 13 companies with different size and business fields were selected for the pretest sample, from which 10 companies agreed to participate. Pretesting in the present study was made by telephone interviews, and those respondents, who wanted, received the questionnaire beforehand via email. During the interviews, the comments of the respondents were received immediately, and the possibility to discuss about questionnaire existed. Based on the pretest interviews few statements and questions were corrected. Although, the questionnaire was rather long, no negative comments were received from the respondents.

## **8.5 *Response Rate***

In mail surveys, nonresponse is a problem because those who respond are likely to differ substantially from those who do not respond. The best way to protect against this bias is to improve the response rate. (Aaker and Day 1990) One of the ways to improve the response rate is the follow-up, with or without a new questionnaire form. Aaker and Day (1990) mentioned the providing of a stamped return envelope and persuasive cover letter as common ways to improve the response rate. Also personalization of the mailing, promises of anonymity, colors and methods of reproduction might have a positive effect on the response rate.

The following efforts were applied in the present study to improve the response rate.

1. The first effort to increase the response rate was the prenotification for the companies conducted with phone calls. This was done to ensure that the questionnaire would reach the right person in the company, and at the same time, the respondents were asked for permission to sending them the

questionnaire, and this way the most probable non-respondents were eliminated.

2. The cover letter was personalized, all the potential respondents received a cover letter, which were addressed to each respondent personally, and the letter was printed on colored and watermarked paper. In addition, the cover letter was personally signed by the researcher.
3. The promise for anonymity was discussed in the cover letter, but also during the prenotification phone calls.
4. Respondents were offered a possibility to receive summary of the present study.
5. Follow-ups were sent after two weeks of the first mailing with a new questionnaire.

The prenotification phone calls were made during the common working hours and in each evening the respondents that agreed to participate a questionnaire was mailed. During the phone calls 47 companies didn't want to participate in the survey and in nine companies, the correct persons were never reached. So, totally 374 questionnaires were sent. After two weeks since the questionnaire was mailed and no response was received, a new questionnaire was sent with a reminder letter. During the mailing, 25 companies announced with e-mail that they wouldn't complete the questionnaire due to different reasons, i.e. lack of time. Totally 222 companies returned the questionnaire, so the effective response rate for the survey was  $222/374=59,4\%$ .

The nonresponse error was studied in two different ways. At first, the basic information for all the companies in the sample was available in the bluebook database. The respondent companies were compared with nonrespondent companies in their size and business field and no bias was found. Second, the reasons for nonresponse were studied on the basis of the notifications received in the prenotification phase and during the mail survey. No bias was found, since the nonrespondents indicated that they denied participating mainly because: 1) they were short of resources in the ICT issues, 2) lack of time, 3) the high amount of different type of surveys arrived to them continuously, and 4) company's management had made a principle not to participate any surveys.

## 9 DESCRIPTIVE ANALYSIS

Descriptive analysis begins with the response behavior. The response pattern is studied and after this the measure scales are compared with earlier and later respondents, in order to find out the response error. The descriptive analysis is then conducted from the respondents' personal characteristics, and after that the descriptive analysis is conducted for the respondent companies.

### 9.1 Response Behavior

#### 9.1.1 Response Pattern

The time, how long it took for a respondent to reply to the questionnaire, is presented in Figure 8-1. The response time was measured in working days. As can be seen, most of the responses were returned after 5 days. After 14 days a reminder was sent and before that 88 percent of the responses had been returned.

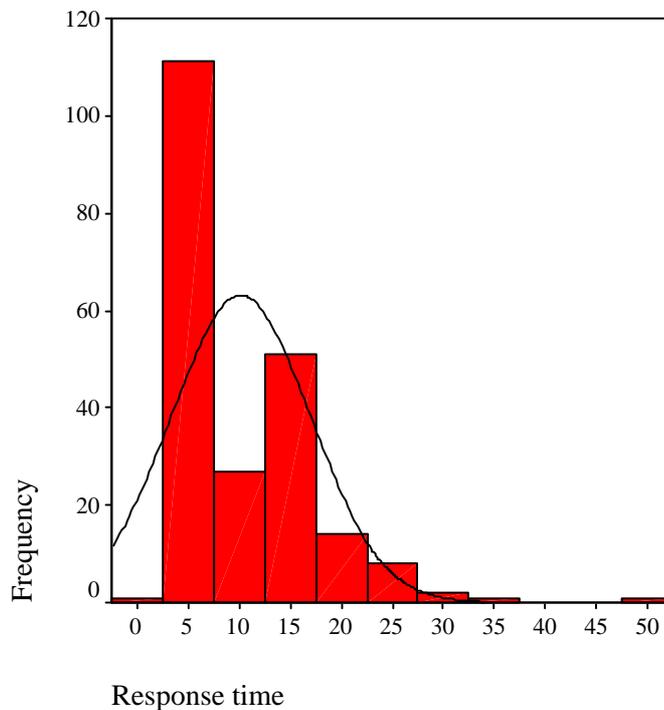


Figure 9-1 Response Time

## 9.1.2 Response Error

The differences between earlier and later responses were studied using t-test and Mann-Whitney U-test based on the normality of the variable. The test of normality of the variables is presented in Appendix 2. The comparison of means between early and late responses and the significance of the difference are presented in Table 8-1. The responses were divided into earlier and later ones in a way that the earlier responses were those returned without the reminder mailing.

**Table 9-1 Response Bias Analysis**

	Mean of early responses	Mean of late responses	Sig.
Relative advantage	3,549	3,665	0,280
Image	3,796	3,724	0,554
Visibility	3,722	3,792	0,682
Result demonstrability	2,847	2,859	0,917
Compatibility	3,433	3,290	0,232
Complexity	2,634	2,843	0,147
Trialability	2,747	2,540	0,145
Size of the buying center	3,566	4,047	0,077
Amount of personnel	259,525	297,208	0,140
Turnover (€)	49,785	66,544	0,032
Decentralization	3,423	3,294	0,212
Decentralization in decision-making	12,115	13,628	0,066
Formalization	3,004	2,839	0,022
Amount of functional departments	5,494	5,560	0,274
Amount of product and service categories	24,722	16,061	0,222
Degree of functional differentiation	3,092	2,882	0,071
Specialization	2,593	2,721	0,267
Share of highly educated employees	6,246	8,636	0,054
Slack resources: capital	3,437	3,491	0,913
Slack resources: educated employees	3,012	3,189	0,208
Slack resources: materials	3,814	3,962	0,237
Slack resources: talented managers	3,208	3,170	0,678
Organizational openness	3,588	3,541	0,560
Age of the company at the time of adoption	44,735	42,432	0,932
Managerial openness toward innovations	3,849	3,940	0,286
Management commitment in adoption	3,273	3,194	0,489
Managerial strategic readiness	3,742	3,711	0,868
Share of highly educated managers	40,655	56,844	0,007
Management's years of employment in the company	13,108	12,427	0,763
Dynamism	2,638	2,744	0,387
Uncertainty	3,138	3,142	0,997
Heterogeneity	2,919	3,034	0,479
Competition rate	4,004	3,920	0,392
Average amount of competitors	16,762	15,184	0,785
Amount of partners	12,472	8,864	0,207
Information behavior among employees	3,239	3,173	0,878
Information behavior of the company	3,524	3,523	0,902
Formality of information behavior	2,494	2,407	0,412
Amount of website providers the company negotiated with	2,274	2,143	0,676
Information received from different sources	19,809	20,071	0,804

Based on the mean comparison, it can be said that no severe bias existed between earlier and later responses, since only two of the variables differed significantly between these two categories.

## 9.2 *Description of the Respondents*

This chapter takes a look at the respondents of the study. A first the respondents' personal characteristics are described. Second, the descriptive characteristics of the companies are discussed. After these, some descriptive information is discussed concerning the current stage of internet adoption.

### 9.2.1 Respondents' Personal Characteristics

A person responsible for internet pages and information systems was asked to participate in the survey during the prenotification phone calls. Table 8-2 represents the positions of the respondents in the firm.

**Table 9-2 Positions of the Respondents**

<i>Position</i>	<i>Frequency</i>	<i>Percent</i>
Information technology managers	36	15,5
Personnel responsible for information technology	31	13,4
Information administration director	25	10,8
Production managers and directors	21	9,1
Financial directors, financial managers	20	8,6
Sales and marketing managers and directors	17	7,3
Managing directors, administrative managers, owners	16	6,9
Development manager, development engineer	14	6,0
Secretaries and assistants	12	5,2
System managers	10	4,3
Other managers and directors	10	4,3
Media and communications managers	6	2,6
Project managers	6	2,6
Supply managers	2	0,9
Missing	6	2,6
<b>Total</b>	<b>232</b>	<b>100,0</b>

Surprisingly, there didn't always exist any special managers responsible only for information technology affairs. Additionally, it was rather interesting that the person

responsible for IT-affairs was sometimes a manager from a higher organizational level and sometimes a director from a lower organizational level.

The age of the respondents was also studied in the questionnaire. It seems that most of the respondents responsible for websites and information technology are aged between thirty and forty years. Only few respondents were younger than thirty years. Also it was considered important to study the education of the respondents. This was made in order to compare the responses between different education levels. Few respondents had received their only education from the elementary school. Half of the respondents had a college degree education and forty percent of the respondents had graduated from university. Three respondents had completed their licentiate or Ph.D. studies. No differences were found when comparing the answers with different type of respondents.

### 9.2.2 Characteristics of Responding Companies

As a basic description of the firms, the establishment year, turnover, amount of personnel and the field of business were studied. Most of the Finnish manufacturing companies were relatively old. On the average, the companies in the present study were established in 1950s. Figure 8-2 illustrates the establishment years of the respondent companies participating in the present study.

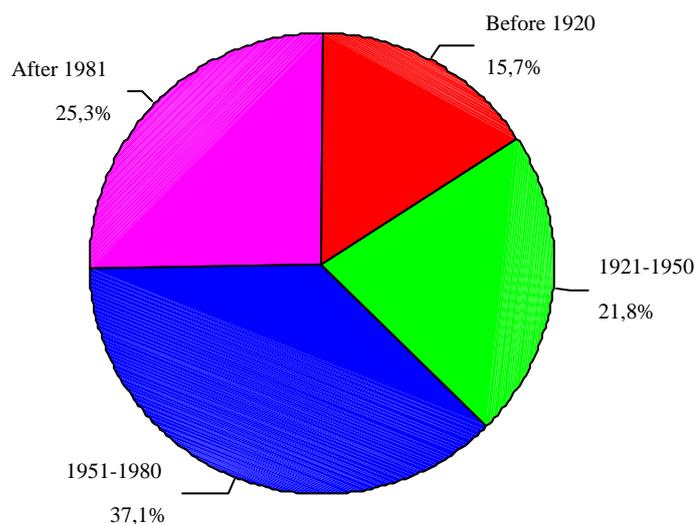


Figure 9-2 Establishment Years of the Companies

In the year 2001 the average turnover was 52 million euros, and on average companies employed 265 persons. Descriptive statistics of both the turnover and amount of personnel are presented in Table 8-3.

**Table 9-3 Descriptive Statistics of the Size of the Companies**

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Minimum</b>	<b>Maximum</b>
Amount of personnel	227	252,507	256,693	23,00	2600,00
Turnover (million €)	221	47,734	71,221	,20	420,47

The field of business was studied on the basis of categories established by Statistics Finland. Table 8-4 covers the main business fields of the respondent companies.

**Table 9-4 Business Fields**

	<b>Frequency Percent</b>	
Production of machines and appliances	36	15,52
Metal industry	29	12,50
Other field of business	24	10,34
Construction industry	22	9,48
Wood products	21	9,05
Production of electronics	18	7,76
Other type of production	17	7,33
Food industry	14	6,03
Rubber and plastic industry	13	5,60
Chemical industry	10	4,31
Production of vehicles	7	3,02
Construction related products	6	2,59
Electricity and gas	5	2,16
Pulp production	4	1,72
Textile industry	3	1,29
Leather products	1	0,43
Non-metal mineral products	1	0,43
Total	231	99,57
Missing	1	0,43
Total	232	100

As it can be seen, most of the firms were operating in heavy industry fields like in the production of machines and appliances and in metal industry. The category named as the other field of business was usually something more related to providing services in addition to manufacturing for another productive industry.

### 9.2.3 Adoption of Internet pages

Almost all of the companies had adopted internet pages (93 %). At the time of the survey seven companies were trying out their first pages and six had made plans for adopting internet pages. Only two companies didn't plan to adopt internet pages. The companies were asked to indicate three time points concerning internet pages' adoption: 1) the year when they became aware of the existence of internet pages, 2) the year in which the adoption decision was made, and 3) the year when they considered their corporate websites permanently established as part of company routines. All these yearly statistics are presented in Figure 8-3. The years, when companies had become aware of the internet varied a lot. The problem here was that many respondents didn't remember the year and also some respondents had worked in a different company during that time. Mainly the companies became aware of internet pages between years 1994-1997.

Correspondingly, respondents were asked what was the year, when their firm had made a decision to adopt internet pages. At this point, the biggest problem was that the respondent had worked in some other place during the time of adoption. The decision to adopt internet pages was concentrated between years 1997-2000.

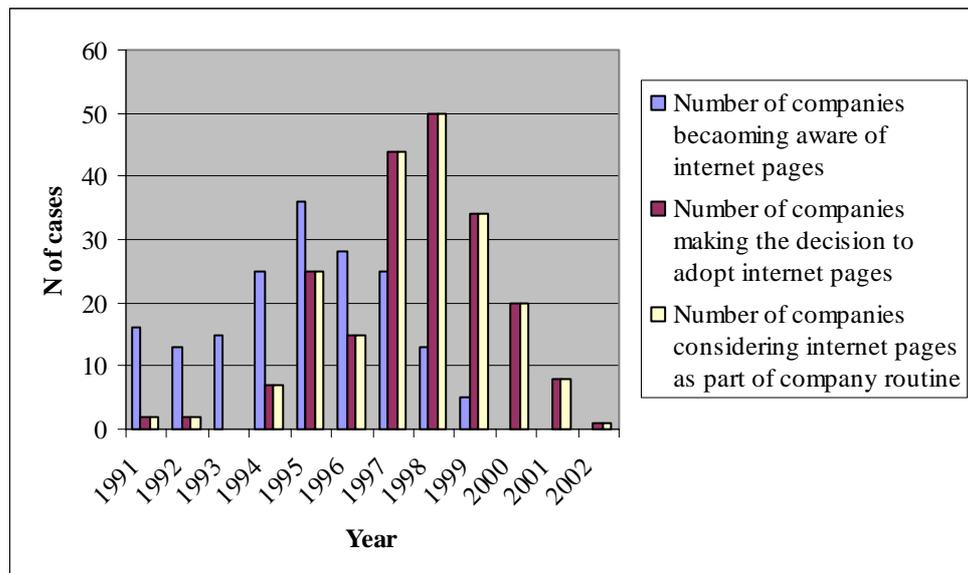


Figure 9-3 Yearly Statistics of Internet Page Adoption among Finnish Small and Medium Sized Industrial Companies

It was also important to know, how the companies considered the position of their internet pages compared to routine functions company, in other words when they saw that their web sites were part of the company's daily routine. Here, eight percent of the companies already having internet pages, didn't consider them as a part of the company's routine function. In most companies, the internet pages became permanently established in use after the year 1998 in most cases.

### ***9.3 Creating the Measurement Scales***

#### **9.3.1 Background Information for Measurement Scale Formation**

**Summated scale** is a method of combining several variables that measure the same concept into a single variable in an attempt to increase the reliability of the measurement through multivariate measurement. In most instances, the separate variables are summed and then their total or average score is used in the analysis (Hair et al. 1998), this is also the method applied in the present study. An underlying assumption and essential requirement for creating a summated scale is that the items are unidimensional, meaning that they are strongly associated with each other and represent a single concept (Hair et al. 1998).

**Factor analysis** is a generic name given to a class of multivariate statistical methods whose primary purpose is to define the underlying structure of interrelationships among large number of variables by defining a set of common underlying dimensions, known as factors (Hair et al. 1998). Factor analysis can create an entirely new set of variables, much smaller in numbers, to partially or completely replace the original set of variables for inclusion in subsequent techniques (Hair et al. 1998). Data reduction relies on the factor loadings as well, but uses them as the basis for either identifying variables for subsequent analysis with other techniques or making estimates of the factors themselves, which then replace the original variables in subsequent analyses.

As related to the unidimensionality of the summated scales, the factor analysis plays a pivotal role in making an empirical assessment of the dimensionality of a set of items by determining the number of factors and the loadings of each variable on the factor. The

test of unidimensionality is that each summated scale should consist of items loading highly on a single factor (Hair et al. 1998). The value of 0,4 for factor loadings is applied as a removal criterion for a variable from the measurement scale.

**Reliability** is an assessment of the degree of consistency between multiple measurements of a variable. One form of reliability is test-retest, by which consistency is measured between the responses for an individual in two points in time. Cronbach's alpha is a widely used measure of reliability. The generally agreed upon lower limit for Cronbach's alpha is 0,7, although it may decrease to 0,6 in exploratory research (Hair et al. 1998).

### **9.3.2 Measurement Scales in the Present Study**

Summated scales are formed from the statements included in the questionnaire. Both reliability and factor analysis are applied to confirm the scales in the present study. At first the reliability of the scales suggested by the literature are analyzed, and after this a factor analysis is conducted for the scales to make sure that they are measuring the same thing. If some group of variables, that were supposed to measure the same thing, didn't load appropriately on the same factor, then some reductions were made and new reliabilities are analyzed. The principal component analysis was applied in all factor analyses.

Reliability analysis was conducted for the original scales as well as for the scales refined due to the results obtained from the factor analysis. The results are presented below in Table 8-5. Few measure scales needed to be refined based on the factor analysis. The final and more reliable scales are illustrated with bolded letters.

Few of the scales had suspicious reliability, and they were under special concern in the further analysis. These were the scales for trialability, specialization and uncertainty.

**Table 9-5 Measurement Scales And Their Reliabilities**

<i>Scale</i>	<i>Cronbach's <math>\alpha</math></i>	<i>Number of items</i>	<i>Number of cases</i>	<i>Mean score</i>
<b>Relative advantage</b>	<b>,8411</b>	<b>6</b>	<b>225</b>	<b>3,5933</b>
<b>Image</b>	<b>,7895</b>	<b>3</b>	<b>224</b>	<b>3,7946</b>
<b>Visibility</b>	<b>,7531</b>	<b>4</b>	<b>223</b>	<b>3,7657</b>
<b>Result demonstrability</b>	<b>,8120</b>	<b>6</b>	<b>222</b>	<b>2,8649</b>
Compatibility	,4553	3	219	3,4916
<b>Compatibility</b>	<b>,6023</b>	<b>2</b>	<b>220</b>	<b>3,3750</b>
<b>Complexity</b>	<b>,8161</b>	<b>2</b>	<b>225</b>	<b>2,6600</b>
<b>Trialability</b>	<b>,4380</b>	<b>2</b>	<b>216</b>	<b>2,6968</b>
Decentralization	,8095	9	226	3,4007
<b>Decentralization</b>	<b>,8312</b>	<b>8</b>	<b>228</b>	<b>3,3958</b>
<b>Degree of decision-making decentralization</b>	<b>,8545</b>	<b>7</b>	<b>198</b>	<b>12,4646</b>
<b>Formalization</b>	<b>,7487</b>	<b>10</b>	<b>228</b>	<b>3,1386</b>
<b>Degree of functional differentiation</b>	<b>,6684</b>	<b>5</b>	<b>206</b>	<b>3,0184</b>
Specialization	,3508	6	227	2,6997
<b>Specialization</b>	<b>,5246</b>	<b>3</b>	<b>228</b>	<b>2,6111</b>
Organizational openness	,7357	8	227	3,4389
<b>Organizational openness</b>	<b>,8840</b>	<b>7</b>	<b>228</b>	<b>3,5489</b>
<b>Management openness</b>	<b>0,8253</b>	<b>5</b>	<b>228</b>	<b>3,8851</b>
Managerial commitment	0,6675	6	226	3,1630
<b>Managerial commitment</b>	<b>0,7622</b>	<b>5</b>	<b>226</b>	<b>3,2770</b>
Managerial strategic readiness	0,7296	5	226	3,7124
<b>Managerial strategic readiness</b>	<b>0,7324</b>	<b>3</b>	<b>227</b>	<b>3,7518</b>
Dynamism	0,7566	9	225	2,6706
<b>Dynamism</b>	<b>0,8386</b>	<b>5</b>	<b>227</b>	<b>2,6749</b>
Uncertainty	0,5049	3	226	3,2183
<b>Uncertainty</b>	<b>0,5096</b>	<b>2</b>	<b>226</b>	<b>3,1327</b>
<b>Heterogeneity</b>	<b>0,8129</b>	<b>7</b>	<b>225</b>	<b>2,9632</b>
Competition rate	0,5824	4	229	3,8788
<b>Competition rate</b>	<b>0,6317</b>	<b>3</b>	<b>229</b>	<b>3,9636</b>
<b>Activeness of information behavior among employees</b>	<b>0,6206</b>	<b>3</b>	<b>224</b>	<b>3,2545</b>
<b>Activeness of information behavior of the company</b>	<b>0,7941</b>	<b>4</b>	<b>222</b>	<b>3,5417</b>
<b>Formality of communication</b>				
<b>Information received for the decision-making</b>	<b>0,7239</b>	<b>8</b>	<b>164</b>	<b>20,561</b>

*Innovation characteristics*

A factor analysis applying VARIMAX rotation was conducted for scales measuring innovation characteristics. Seven factors were extracted and they are presented in Table 8-6. Based on these results, one statement was dropped out from the scale of compatibility. For all other perceived characteristics, the variables were loading on the correct factor. The statements in the measurement scales of perceived innovation characteristics were mainly acquired from several previous studies (e.g. Moore and

Benbasat 1991, Karahanna et al. 1999, Walczuch et al. 2000), but modified to describe the characteristics of internet pages.

**Table 9-6 Final Factor Solution for Innovation Characteristics**

<b>Variables</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>	<b>Factor 5</b>	<b>Factor 6</b>	<b>Factor 7</b>
Relative advantage 1	0,722						
Relative advantage 2	0,758						
Relative advantage 3	0,617						
Relative advantage 4	0,700						
Relative advantage 5	0,661						
Relative advantage 6	0,761						
Result demonstrability 1		0,618					
Result demonstrability 2		0,660					
Result demonstrability 3		0,562					
Result demonstrability 4		0,656					
Result demonstrability 5		0,685					
Result demonstrability 6		0,595					
Image 1			0,476				
Image 2			0,614				
Image 3			0,499				
Visibility 1				0,604			
Visibility 2				0,433			
Visibility 3				0,519			
Visibility 4				0,804			
Compatibility 1					0,788		
Compatibility 2					0,820		
Complexity 1						0,890	
Complexity 2						0,881	
Trialability 1							0,792
Trialability 2							0,708
<i>Eigenvalue</i>	8,427	2,420	1,757	1,553	1,307	1,202	1,113
<i>% of variance explained</i>	30,098	8,644	6,275	5,548	4,670	4,294	3,974
<i>Cumulative % of variance explained</i>	30,098	38,742	45,017	50,565	55,234	59,529	63,503

### *The Buying Center*

In the analysis where the explaining factors are sought for the timing of adoption, the number of decision-makers involved in the internet pages adoption-decision is used as a pure measure of the buying center.

## Organizational Structure

In the case of organizational characteristics, the first factor analysis was conducted without rotation for the variables measuring centralization (measures obtained from Hage and Aiken 1967, Aiken and Hage 1971, Hull and Hage 1982, and Grover et al. 1995), formalization (from Hage and Aiken 1967, Hull and Hage 1982, and Grover et al. 1995) and specialization (from Aiken and Hage 1971 and Subramanian and Nilakanta 1996). The analysis provided six factors, on which the variables loaded, but the results for three relevant of them are presented in Table 8-7. The remaining three factors included individual statements that weren't valid for the specialization measure (see Table 8-5 reliability analysis). The measures for organizational structure were obtained from previous studies conducted by

**Table 9-7 Final Factor Solution for Organizational Structure**

<b>Variables</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>
Decentralization 2	0,485		
Decentralization 3	0,734		
Decentralization 4	0,621		
Decentralization 5	0,537		
Decentralization 6	0,774		
Decentralization 7	0,638		
Decentralization 8	0,708		
Decentralization 9	0,573		
Formalization 1		0,645	
Formalization 2		0,497	
Formalization 3		0,407	
Formalization 4		0,629	
Formalization 5		0,623	
Formalization 6		0,448	
Formalization 7		0,460	
Formalization 8		0,431	
Formalization 9		0,498	
Formalization 10		0,653	
Specialization 1			0,526
Specialization 2			0,741
Specialization 4			0,478
<i>Eigenvalue</i>	4,953	4,205	1,880
<i>% of variance explained</i>	19,813	16,818	7,521
<i>Cumulative % of variance explained</i>	19,813	36,631	44,153

The statements concerning organizational attitudes toward innovations and change were targeted to measure the organizational openness toward innovations. Altogether there were eight statements and their loading on one and the same factor was confirmed. No

rotation was applied in this analysis. Two factors were extracted, and Table 8-8 represents the loading for the first factor measuring the organizational openness toward change and innovations. Thus, one variable was dropped out of the openness. The measurement statements were created for the present study based on the work of Zaltman et al. (1984).

**Table 9-8 Final Factor Solution for Organizational Openness**

<b>Variables</b>	<b>Factor 1</b>
Organizational openness 2	0,770
Organizational openness 3	0,725
Organizational openness 4	0,683
Organizational openness 5	0,771
Organizational openness 6	0,828
Organizational openness 7	0,513
Organizational openness 8	0,703
<i>Eigenvalue</i>	3,722
<i>% of variance explained</i>	46,519
<i>Cumulative % of variance explained</i>	46,519

Other measures that represented the organizational structure were the size of an organization measured with the total amount of personnel and the company turnover, the share of highly skilled employees, the number of functional departments, and the number of product categories that the companies offered. The degree of functional differentiation was measured by the mean of the variables that describe the difference between the companies' product categories. Measures for functional differentiation were formed based on the studies of Aiken et al. (1980) and Miller and Friesen (1982). Measurement for slack resources, obtained from Miller and Friesen (1982), was divided into independent constructs concerning the slack related to employees, capital, material and managerial talent. The establishment year of the company was modified for the analysis to represent the age of the company at the time of internet pages' adoption.

### *Managerial Influence*

Management behavior and attitudes were measured in three different dimensions: 1) managerial attitudes toward change and innovations, 2) managerial commitment in innovation adoption, and 3) the strategic readiness of the managers in innovation adoption. A factor analysis was conducted with the VARIMAX rotation. Five factors were extracted from which the first three represented the above-mentioned dimensions.

Statements that were inappropriate for these scales loaded on the last two factors. The final factor solution is in Table 8-9. Measures for managerial influence were created in the present study based on previous studies conducted by Zaltman et al. (1984) and Sultan and Chan (2000).

**Table 9-9 Final Factor Solution for Managerial Behavior**

<b>Variables</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>
Managerial openness toward innovations 1	0,695		
Managerial openness toward innovations 2	0,663		
Managerial openness toward innovations 3	0,794		
Managerial openness toward innovations 4	0,779		
Managerial openness toward innovations 5	0,629		
Managerial commitment in innovation adoption 1		0,603	
Managerial commitment in innovation adoption 2		0,536	
Managerial commitment in innovation adoption 3		0,859	
Managerial commitment in innovation adoption 4		0,687	
Managerial commitment in innovation adoption 5		0,721	
Managerial strategic readiness 1			0,811
Managerial strategic readiness 2			0,747
Managerial strategic readiness 3			0,600
<i>Eigenvalue</i>	5,178	2,063	1,261
<i>% of variance explained</i>	32,360	12,893	7,882
<i>Cumulative % of variance explained</i>	32,360	45,254	53,135

Additionally, the share of the highly educated managers and the average years of employment in the current company are measures that were used to describe the management team.

### *Environmental Factors*

The statement included in the measurement scales describing organizational environment were obtained from studies conducted by Miller and Friesen (1982) and Grover et al. (1995). Measurement scales for environmental factors were confirmed with VARIMAX-rotation. Totally seven factors were extracted, from which the first four described the environmental factors. The final factor solution is in Table 8-10.

**Table 9-10 Final Factor Solution for Environmental Characteristics**

	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>	<b>Factor 4</b>
Heterogeneity 1	0,633			
Heterogeneity 2	0,531			
Heterogeneity 3	0,646			
Heterogeneity 4	0,736			
Heterogeneity 5	0,760			
Heterogeneity 6	0,553			
Heterogeneity 7	0,500			
Dynamism 1		0,423		
Dynamism 2		0,752		
Dynamism 3		0,738		
Dynamism 4		0,747		
Dynamism 5		0,802		
Competition rate 1			0,801	
Competition rate 2			0,583	
Competition rate 3			0,774	
Competition rate 4			0,452	
Uncertainty 1				0,698
Uncertainty 2				0,687
Uncertainty 3				0,575
<i>Eigenvalue</i>	6,124	2,033	1,657	1,393
<i>% of variance explained</i>	25,518	8,469	6,906	5,806
<i>Cumulative % of variance explained</i>	25,518	33,987	40,893	46,698

In addition to the statements describing environmental conditions, pure measures of the average amount of competitors for each product category, and the amount of partners are applied in the further analysis.

#### *Information behavior*

The activeness of information behavior and its formality was measured with statements and their fit for the measurement scale was confirmed with factor analysis applying VARIMAX-rotation. The statements were formed based on the studies of Miller and Friesen (1982), Grover et al. (1995), Frambach et al. (1998) and Sultan and Chan (2000). The three extracted factors are presented in Table 8-11.

**Table 9-11 Final Factor Solution for Information Behavior**

<b>Variables</b>	<b>Factor 1</b>	<b>Factor 2</b>	<b>Factor 3</b>
Information behavior of the company 1	0,532		
Information behavior of the company 2	0,735		
Information behavior of the company 3	0,900		
Information behavior of the company 4	0,787		
Information behavior of employees 1		0,512	
Information behavior of employees 2		0,770	
Information behavior of employees 3		0,832	
Formality of communication 1			0,803
Formality of communication 2			0,695
<i>Eigenvalue</i>	3,280	1,235	1,037
<i>% of variance explained</i>	36,449	13,727	11,522
<i>Cumulative % of variance explained</i>	36,449	50,176	61,698

The statements discussed above describe the information behavior in the companies in general. Additionally, there existed other measures related to information behavior and website adoption. The first of these additional measures deals with the amount of different website providers that the companies negotiated with. The second measure describes the amount of information received from different sources concerning internet pages.

# 10 DETERMINING THE FACTORS AFFECTING INNOVATION ADOPTION AMONG ORGANIZATIONS

The purpose of this chapter is to find factors that explain the timing of website adoption, and thus, a regression analysis is conducted with all the measures introduced in the previous chapter, and the hypothesis are discussed based on the regression results. But at first a quick look is given to the estimation method applied in the regression analysis.

## *10.1 Backward Elimination Estimation in Regression Analysis*

Backward elimination estimation is a method of selecting variables for inclusion in the regression model that starts by including all the independent variables in the model and then eliminating those variables not making a significant contribution to prediction (Hair et al. 1998). The backward estimation method has the ability to delete variables at each stage of the process, but once a variable is deleted, there is no chance of revising the action at a later change.

### **10.1.1 Regression Model for the Survey Data**

The purpose of the regression analysis is to test the hypotheses and to find out, which of the independent variables explain the dependent variable, i.e. the adoption timing. The backward elimination estimation resulted 34 models. The best model was the last one with  $R^2 = 0.140$ . All the measurement constructs discussed previously were included in the model. The variables having poor reliability were also taken into the analysis, but the same analysis was also conducted without these variables, and no changes in the results were obtained. Table 9-1 presents the model statistics and Table 9-2 provides the statistics for all independent variables. The variables included in the model are separated from the other variables with the coefficient B, which was only estimated for the variables included in the model. The value  $\beta$  for excluded variables is the coefficient that the variable in question would have received, if it had been included in the model.

**Table 10-1 Model Statistics for Backward Elimination Estimation**

<i>Dependent variable</i>	<i>R</i>	<i>R<sup>2</sup></i>	<i>Adj. R<sup>2</sup></i>	<i>F</i>	<i>Sig.</i>
The decision year	0,374	0,140	0,112	4.893	0.001

**Table 10-2 Coefficients for the Independent Variables**

	<i>B</i>	<i>β</i>	<i>t</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypoth.</i>
(Constant)	2002,9		1530,0	,000		
Relative advantage	-,637	-,221	-2,618	,010	,960	H1
Image		-,012	-,121	,904	,748	H2
Visibility		,009	,088	,930	,692	H3
Result demonstrability		,035	,331	,741	,606	H4
Compatibility		,060	,720	,473	,974	H5
Complexity		-,006	-,073	,942	,939	H6
Trialability		,040	,477	,634	,960	H7
Size of the buying center		-,026	-,305	,761	,966	H8
Amount of personnel		-,038	-,459	,647	,992	H9
Decentralization		-,014	-,156	,876	,881	H10a
Decentralization in decision-making		,035	,424	,672	,984	H10b
Formalization		,098	1,099	,274	,854	H11
Amount of functional departments		-,007	-,084	,933	,998	H12a
Amount of product and service categories		,002	,027	,978	,984	H12b
Degree of functional differentiation		-,008	-,097	,923	,959	H12c
Specialization		-,048	-,575	,566	,989	H13a
Share of highly educated employees		-,149	-1,732	,086	,906	H13b
Slack resources: capital		-,060	-,716	,475	,988	H14a
Slack resources: educated employees		-,025	-,294	,769	,956	H14b
Organizational openness		-,083	-,941	,349	,879	H15
The age of the company at the time of adoption		-,020	-,244	,807	,981	H16
Managerial openness toward innovations		,007	,076	,939	,823	H17
Management commitment in innovation adoption	-,488	-,172	-2,078	,040	,990	H18
Managerial strategic readiness		,050	,536	,593	,788	H19
Share of highly educated managers		-,101	-1,186	,238	,932	H20
Management's years of employment in the company		,056	,669	,505	,987	H21
Dynamism		,014	,135	,893	,633	H22
Uncertainty		-,026	-,302	,763	,914	H23
Heterogeneity	-,426	-,147	-1,732	,086	,948	H24
Competition rate		,102	1,193	,235	,936	H25a
Average amount of competitors for each product category		-,033	-,395	,693	,967	H25b
Amount of partners	-,015	-,167	-2,008	,047	,983	H26
Activeness of information behavior of the company		-,115	-1,343	,182	,918	H27
Activeness of information behavior among employees		-,063	-,711	,478	,864	H28
Formality of information behavior		,060	,716	,475	,983	H29
Amount of website providers the company negotiated with		,000	,001	,999	,979	H30
Amount of information received from different sources		,035	,418	,677	,957	H31

### 10.1.2 Analyzing Multicollinearity of the Regression Model

Collinearity refers to the troublesome situation where the correlations among the independent variables are strong (SPSS Inc. 1997). There exist several possible ways to assess multicollinearity from the regression model: 1) tolerance, 2) variance inflation factor, 3) eigenvalues, 4) condition index, and 5) variance proportions.

**The tolerance** is a commonly used measure of collinearity. Only the independent variables are used to calculate values for tolerance; the dependent variable is ignored. For each variable, the tolerance is:

$$Tol. = 1 - R_i^2 \quad (3)$$

where the  $R^2$  is the squared multiple correlation of that variable with the other independent variables. Values of tolerance range from 0 to 1. When the value is small (close to 0), the variable is almost a linear combination of the other variables, so the estimate of the variable's regression coefficient is unstable, and the computations can lose numeric accuracy (SPSS Inc. 1997). The tolerance values for all independent variables included and excluded are presented in Table 9-2. As can be seen none of the values for tolerance were close to zero, indicating no problems related to collinearity.

**Variance inflation factor** is the reciprocal of tolerance. By definition, the variables with low tolerances have high variance inflation factors. As the variance inflation factor increases, so does the variance of the regression coefficient. (SPSS Inc. 1997) The variance inflation factors for the independent variables were all very close to value 1.

**Eigenvalues** are obtained by factoring the scaled, uncentered cross-products matrix of the independent variables. Eigenvalues provide an indication of how many distinct dimensions there are among the independent variables. When several eigenvalues are close to 0, the variables are highly intercorrelated and the matrix is said to be ill-conditioned, in other words, small changes in the data values may lead to large changes in the estimates of the coefficients. (SPSS Inc. 1997) In the present study, this wasn't found to be a problem, as only one of the eigenvalues was close to 0.

**Condition indices** are the square roots of the ratios of the largest eigenvalue to each successive eigenvalue. A condition index greater than 15 indicates a possible problem and an index greater than 30 suggests a serious problem with collinearity. (SPSS Inc.

1997) In the current model, only one index was found to exceed the value 15, but no severe problems could be expected after studying the variance proportions.

**Variance proportions** are the proportions of the variance of the estimate accounted for by each principal component associated with each of the eigenvalues. Collinearity is a problem when a component associated with a high condition index contributes substantially to the variance of two or more variables. (SPSS Inc. 1997) In the current model, one higher condition index was found, but its contribution was high only on one of the variables.

Based on these analyses it can be said that no multicollinearity exists in the regression model estimated in the present study.

## ***10.2 Testing the Hypothesis***

The hypotheses are tested based on the results provided by the regression analysis, and the factors that have been affecting the internet page adoption in companies are recognized. The factors that affect the companies' internet page adoption are discussed in six parts. At first the innovation characteristics and their effects on the timing of adoption is discussed. Second, the focus is in the buying center's effect on the adoption. The third part discusses the relationship between adoption timing and organizational characteristics. The fourth part concentrates on managerial influence on the adoption. Next, the information behavior is discussed, and after that the focus turns to the environmental characteristics.

### **10.2.1 Innovation Characteristics**

Hypothesis H1-H7 discussed the perceived innovation characteristics and their effect on innovation adoption. It was hypothesized that relative advantage, result demonstrability, image, visibility, compatibility and trialability would have a positive effect the innovation adoption, and correspondingly, it was hypothesized that complexity would effect negatively on innovation adoption.

**Table 10-3 Regression Coefficients for Innovation Characteristics**

<i>Independent variable</i>	<i>B</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypothesis</i>
Relative advantage	-,637	-,221	-2,618	,010	,960	H1
Image	-	-,012	-,121	,904	,748	H2
Visibility	-	,009	,088	,930	,692	H3
Result demonstrability	-	,035	,331	,741	,606	H4
Compatibility	-	,060	,720	,473	,974	H5
Complexity	-	-,006	-,073	,942	,939	H6
Trialability	-	,040	,477	,634	,960	H7

Based on the analysis only one hypothesis, H1, concerning the perceived relative advantage of internet pages was supported. The perceived relative advantage has a positive effect on corporate website adoption. The negative coefficient for relative advantage in Table 9-3 results from the measurements since the higher the perceived relative advantage the smaller the value for the year of website adoption. All the other hypothesis are rejected, in other words result demonstrability, image, visibility, compatibility, complexity and trialability didn't have significant effects on website adoption in the present study.

### 10.2.2 The Buying Center

Concerning the buying center it was hypothesized that the smaller the buying center, the sooner the innovations are adopted. In the case of corporate websites, the hypothesis H8 is rejected. The coefficients are presented in Table 9-4.

**Table 10-4 Regression Coefficients for Buying Center Effects**

<i>Independent variable</i>	<i>B</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypothesis</i>
Size of the buying center	-	-,026	-,305	,761	,966	H8

In addition, the results indicated that the larger the size of the buying center, the sooner the innovations are adopted, but since the coefficient for this variable wasn't significant in the model, it can be concluded that the size of the buying center didn't affect the website adoption.

### 10.2.3 Organizational Characteristics

In the case of organizational characteristics, some selections had to be made concerning those variables that measured the same construct (i.e. size and slack resources), and only one measure was selected since there was a relatively high correlation between the measures. In the case of the organizational size, a high correlation existed between the turnover and the amount of employees, and based on this only the amount of personnel was selected for the regression analysis. In the case of slack resources, there were only two measures that didn't correlate very strongly and these were the availability of educated employees and capital, and these were selected for the analysis. The correlation matrix is in Appendix 4.

Table 9-5 reviews results concerning organizational characteristics discussed in hypotheses H9-H16. The first of these, H9, stating that the larger the organization the sooner the innovations are adopted, wasn't supported. The direction for the coefficient is right, but not significant in the corporate website adoption. Hypothesis H10a and H10b covered the effect of decentralization measured in two different ways. However, neither of these hypotheses was supported by the analysis.

According to hypothesis H11, formalization has a negative impact on innovation adoption. The regression results didn't support this hypothesis either, although the coefficient would have the hypothesized direction, where less formal organization would adopt websites later than others.

**Table 10-5 Regression Coefficients for Organizational Characteristics**

<i>Independent variable</i>	<i>B</i>	<i>Beta</i>	<i>T</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypothesis</i>
Amount of personnel	-	-.038	-.459	,647	,992	H9
Decentralization	-	-.014	-.156	,876	,881	H10a
Decentralization in decision-making	-	,035	,424	,672	,984	H10b
Formalization	-	,098	1,099	,274	,854	H11
Amount of functional departments	-	-.007	-.084	,933	,998	H12a
Amount of product and service categories	-	,002	,027	,978	,984	H12b
Degree of functional differentiation	-	-.008	-.097	,923	,959	H12c
Specialization	-	-.048	-.575	,566	,989	H13a
Share of highly educated employees	-	-.149	-1,732	,086	,906	H13b
Slack resources: capital	-	-.060	-.716	,475	,988	H14a
Slack resources: educated employees	-	-.025	-.294	,769	,956	H14b
Organizational openness	-	-.083	-.941	,349	,879	H15
The age of the company at the time of adoption	-	-.020	-.244	,807	,981	H16

The relationship of functional differentiation and adoption timing was discussed in three hypotheses, H12a-H12c. Based on the analysis all of these hypotheses had to be rejected. The coefficient for the first hypothesis, H12a, stating that the higher the amount of functional departments the sooner the innovations are adopted, had the right direction but lacked of statistical significance, and the coefficient was really close to zero. The same fact covers for the degree of functional differentiation, but also this coefficient was almost zero and without statistical significance.

Specialization was measured and tested in two different ways. Neither of hypotheses H13a nor H13b was supported. The measurement scale used in testing hypothesis H13a was based on statements, with poor reliability, but still the direction of the coefficient was right. The hypothesis 13b stating that the higher the education of the employees of the company (describing the specialization) the sooner the innovations are adopted, was almost supported, and also the direction of the coefficient would have supported the hypothesis.

Two hypotheses were dealing with the slack resources. H14a hypothesized that availability of capital facilitates innovation adoption and H14b hypothesized that the availability of educated employees facilitates innovation adoption. Both of these hypotheses were rejected, although their coefficients would have been in the right direction indicating that the slack resources might facilitate innovation adoption.

The open attitudes of organizations toward innovations and change were tested with hypothesis H15. The coefficient for the organizational openness was close to zero and was not statistically significant, leading to the rejection of the hypothesis. The final hypothesis, H16, concerning the organizational structure, was the age of the organization. The measure applied for this was the age of the organization at the time of adoption decision. Based on the regression results also this hypothesis had to be rejected, indicating the establishment of the company didn't have any effects on website adoption in the present study. Based on the analysis, it can be concluded that, the characteristics of the organization would had no effects on the adoption time of corporate websites.

## 10.2.4 Managerial Influence

Managerial influence on corporate website adoption were tested with hypotheses H17-H21 and the results are presented in Table 9-6.

**Table 10-6 Regression Coefficients for Managerial Influence**

<i>Independent variable</i>	<i>B</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypothesis</i>
Managerial openness toward innovations	-	,007	,076	,939	,823	H17
Management commitment in innovation adoption	-,488	-,172	-2,078	,040	,990	H18
Managerial strategic readiness	-	,050	,536	,593	,788	H19
Share of highly educated managers	-	-,101	-1,186	,238	,932	H20
Management's years of employment in the company	-	,056	,669	,505	,987	H21

The first hypothesis, H17, covering managerial effects on innovation adoption, stated that the more open the company's management is toward innovation adoption the sooner the innovations are adopted, and was rejected according to the analysis. The next hypothesis, H18, discussed the role of managerial commitment in innovation adoption. In other words, the more committed the management team is related to the adoption process the sooner the innovations are adopted. This hypothesis was supported by the analysis. This indicates that the higher commitment of management in the adoption process facilitates innovation adoption.

Hypothesis, H19, considered the strategic readiness of management to adopt innovations, i.e. resource planning. This hypothesis wasn't supported by the analysis and the coefficient for this variable was really close to zero. According to hypothesis H20, companies with larger share of higher educated managers would be more likely to adopt innovation sooner. This wasn't supported based on the analysis, though the coefficient was quite high and had the right direction.

The hypothesis H21 discussed how long the management had been working in the current company and whether this has any effects on innovation adoption, indicating that management team that has been working shorter time period in the company, has a positive impact on the adoption. This was tested with the average amount of years that the management team has been employed by their current company. The direction of the coefficient was right, but no statistical significance was found to support the hypothesis. Thus, it can be concluded that the managerial influence on internet pages' adoption

concentrates on the degree of managerial commitment in innovation adoption has a positive effect on corporate website adoption.

### 10.2.5 Environmental Characteristics

The effects of environmental characteristics were tested in hypotheses H22-H26 (Table 9-7). Dynamism was discussed in the hypothesis H22, in a way, that more dynamic environment facilitates innovation adoption. The regression analysis didn't support this, and the direction of the coefficient seemed to be in the opposite direction.

**Table 10-7 Regression coefficients for environmental characteristics**

<i>Independent variable</i>	<i>B</i>	<i>Beta</i>	<i>T</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypoth.</i>
Dynamism	-	,014	,135	,893	,633	H22
Uncertainty	-	-,026	-,302	,763	,914	H23
Heterogeneity	-,426	-,147	-1,732	,086	,948	H24
Competition rate	-	,102	1,193	,235	,936	H25a
Average amount of competitors for each product category	-	-,033	-,395	,693	,967	H25b
Amount of partners	-,015	-,167	-2,008	,047	,983	H26

The next hypothesis, H23, discussed the environmental uncertainty, in other words, high uncertainty in the environment was believed to facilitate innovation adoption. This wasn't supported in the analysis and it has to be remembered that the measurement for uncertainty wasn't very reliable. According to the hypothesis H24, the more heterogeneous the environment of the company, the sooner the innovations are adopted. The analysis nearly supported this hypothesis, indicating that companies operating in a more heterogeneous environment adopted internet pages sooner than others.

Competition was discussed in hypotheses H25a and H25b. The first measure, for hypothesis H25a, was formed from the statements describing competition rate and confirmed with the factor analysis. Regression analysis didn't support this hypothesis, which was stating that the higher rate of competition would facilitate innovation adoption. The measure for testing hypothesis H25b was the average number of competitors for each product category, and the hypothesis suggested, that the more the company has competitors, the sooner the innovations are adopted, but the regression result led to rejection of this hypothesis. Hypothesis H26 suggested that amount of partners would effect positively on innovation adoption, and this was confirmed in the

case of corporate websites. According to the analysis, the higher the amount of partners, the sooner the internet pages were adopted. To conclude, the heterogeneity in the environment seems to have a little impact on website adoption, and the cooperation affected significantly on the adoption timing of internet pages among the manufacturing companies.

### 10.2.6 Information Behavior

Information behavior was discussed in few dimensions. The first dimension discussed the information seeking and processing among the employees and concerning the whole company. The second dimension discussed the formality of the communication inside the company as the degree of the information moving via formal channels. The third dimension was the information received outside the company concerning internet pages.

**Table 10-8 Regression Coefficients for Information Behavior**

<i>Independent variable</i>	<i>B</i>	<i>Beta</i>	<i>t</i>	<i>Sig.</i>	<i>Tol.</i>	<i>Hypothesis</i>
Activeness of information behavior of the company	- ,115	-1,343	,182	,918		H27
Activeness of information behavior among employees	- ,063	-,711	,478	,864		H28
Formality of information behavior	- ,060	,716	,475	,983		H29
Amount of website providers the company negotiated with	- ,000	,001	,999	,979		H30
Amount of information received from different sources	- ,035	,418	,677	,957		H31

The hypothesis H27 stated, that the more active the company is on information seeking and processing, the sooner it adopts innovations. The regression analysis didn't give any statistical support for this, though the coefficient is quite high and in the hypothesized direction. Based on hypothesis H28, it was proposed that more active information behavior among the employees would facilitate innovation adoption, but also this hypothesis had to be rejected based on the analysis. According to hypothesis H29 the formal communication in the company inhibits innovation adoption. As can be seen from the results, this hypothesis was rejected also, and it has to be remembered that the measure for formality of communication had a low reliability.

The next hypothesis, H30, was also rejected and the coefficient that the measure received was zero, so totally nonsignificant to the adoption of websites. Last hypothesis, H31, stated that the more information the company received from different sources concerning the innovation, the sooner it is adopted. This was also rejected due to the

analysis. To conclude, the information behavior of didn't affect at all the adoption timing in the case internet pages.

# 11 CATEGORIZING ORGANIZATIONS IN ADOPTER CATEGORIES

This chapter divides companies into adopter categories, based on the website adoption. The method applied in the clustering procedure is introduced at first and then applied to the survey data. After the categories are formed, the differences between adopter categories are identified.

## *11.1 Selecting the Method*

The primary objective of a cluster analysis is to define the structure of the data by placing the most similar observations into groups (Hair et al. 1998). Two types of clustering methods were available, a hierarchical clustering and a non-hierarchical clustering method referred as a  $k$ -means clustering. The hierarchical procedures involve the construction of a treelike structure. In hierarchical procedures, the results at an earlier stage are always nested within the results at a later stage. Non-hierarchical clustering methods don't include the treelike construction process. Instead, they assign objects to clusters once the number of clusters to be formed is specified (Hair et al. 1998). At first, a cluster seed is selected as the initial cluster center, and all objects within a prespecified threshold distance are included in the resulting cluster. Then another seed is chosen, and the assignment continues until all objects are assigned.

The  $k$ -means clustering was applied to the Finnish survey data and therefore it will be discussed more specifically. The procedure begins by using the values of the first  $k$  cases in the data file as temporary estimates of the  $k$  cluster mean, where the  $k$  is the number of clusters specified by the user (SPSS inc. 1997). Initial cluster centers are formed by assigning each case in turn to the cluster with the closest center and then updating the center. Then, an iterative process is used to find the final cluster centers. At each step, cases are grouped into the cluster with the closest center, and the cluster centers are recomputed. This process continues until no further changes occur in the centers or until the maximum number of iterations is reached.

## ***11.2 Adopter Categories in the Finnish Survey***

At first companies are divided into to groups based on whether they had already adopted internet pages or not. The innovativeness of an organization was considered to consist of three dimensions: 1) the timing of awareness, 2) the timing when decision to adopt was made, and 3) from the time it took to implement internet pages as part of company routines. A new variable was calculated for the implementation time.

When conducting the first *k*-means cluster analysis, requested amount of clusters was four. These results weren't appropriate, since the three first clusters had a sensible amount of cases in each, but the last cluster had only few cases, and no significant differences to the other clusters. Another cluster analysis was conducted requiring three clusters. The results were more sensible and the cluster centers were more relevant. The final cluster solution is presented in Table 10-1. Totally 207 responses were valid for the analysis.

**Table 11-1 Final Cluster Centers And Amount of Cases in Each Cluster**

<b>Variable</b>	<b>Cluster</b>		
	1	2	3
Year of awareness	1993,48	1993,22	1996,58
Decision year	1994,83	1997,23	1998,57
Implementation time	3,68	1,16	1,18
Number of cases in the cluster	35	70	102

These clusters can be easily attached to innovation adopter categories. The first clusters was renamed as innovators, since they were the first to acquire corporate websites and they were among the firsts to become aware of them. The second cluster was renamed as early adopters, they were also among the firsts to become aware of the existence of internet pages, but the decision to adopt was made later. The third cluster represented early majority. They became later aware of internet pages and made the adoption decision later. As can be seen, the implementation time is shorter for the later adopters. This may be due to the pressure of customers, partners or competitive situation, or organizational structure. Those companies that had not yet adopted internet pages at the time of the survey, were classified into the fourth cluster representing the late majority.

### 11.3 Identification of Differences between Adopter Categories

The differences between adopter categories were analyzed with two different analysis methods. For the normally distributed independent variables (see Appendix 3) the oneway analysis of variance was the method applied. Correspondingly, the Kruskal-Wallis –test was applied for the nonparametric variables. The results are discussed in detailed parts.

#### 11.3.1 Innovation Characteristics

Table 10-2 illustrates the results of the mean value comparisons of perceived innovation characteristics between the adopter categories. Significant differences were found in perceptions of relative advantage, image, visibility and result demonstrability. As the regression analysis already showed, the perceived relative advantage had a strong relationship with the adoption timing. Correspondingly, the perceived relative advantage differed significantly between the adopter categories. Innovators perceived that they received a higher relative advantage concerning their internet pages compared to other categories. Same conclusion could be made, when the perceived image, visibility and result demonstrability were studied. In the case of image, the value was highest for innovators and lowest for the late majority.

**Table 11-2 Mean Comparison of Innovation Characteristics between Adopter Categories**

<i>Independent variable</i>	<i>Innovators</i>	<i>Early adopters</i>	<i>Early majority</i>	<i>Late majority</i>	<i>Sig.</i>
Relative advantage	3,868	3,523	3,531	3,546	<b>0,005</b>
Image	3,977	3,751	3,809	3,625	<b>0,039</b>
Visibility	3,953	3,692	3,750	3,711	<b>0,006</b>
Result demonstrability	3,022	2,746	2,935	3,022	<b>0,052</b>
Compatibility	3,407	3,460	3,142	3,533	0,747
Complexity	2,779	2,561	2,815	2,567	0,418
Trialability	2,631	2,677	2,830	2,962	0,964

Value for the perceived visibility was again highest for innovators but lowest for early adopters. The innovators perceive that the result demonstrability is very high concerning internet pages. But also the late majority that hasn't yet adopted received the exact same mean value, so they also believed that the result demonstrability would be high if they would establish corporate websites. When the significant differences were studied, it

was noticed that the early adopters had lower perceptions compared to early majority. In a way early majority can be considered more innovative, since the time it took from awareness to adoption decision, was much shorter compared to early adopters, and maybe the high perception of the positive characteristics could explain the faster decision period of early majority.

### 11.3.2 Buying Center

The amount of persons involved in the decision-making was naturally compared only between the first three categories. No significant differences could be identified. The average amount of persons in the buying center was between three and four in each adopter category.

**Table 11-3 Comparison of the Buying Center Size**

<i>Independent variable</i>	<i>Innovators</i>	<i>Early adopters</i>	<i>Early majority</i>	<i>Late majority</i>	<i>Sig.</i>
Size of the buying center	3,675	3,543	3,961		0,115

### 11.3.3 Organizational Structure

The results of the comparison concerning the organizational structure are presented in Table 10-4. If the regression analysis didn't indicate any relationships between adoption timing and organizational structure, the mean comparison between adopter categories revealed numerous significant differences. Based on the analysis, innovators are larger companies measured with the amount of personnel. On the other hand, the early majority is larger measured with turnover, and the higher turnover might be one explanation for the fast decision and short implementation time that these companies had. Measured in either of the ways, the early adopters and late majority are smaller in size. No significant differences were found concerning centralization, formalization, functional differentiation and slack resources.

**Table 11-4 Comparison of Organizational Structure between Adopter Categories**

<i>Independent variable</i>	<i>Innovators</i>	<i>Early adopters</i>	<i>Early majority</i>	<i>Late majority</i>	<i>Sig.</i>
Amount of personnel	295,395	249,250	271,245	270,500	<b>0,045</b>
Turnover (million €)	53,928	49,590	57,419	46,560	<b>0,003</b>
Decentralization	3,509	3,380	3,412	3,216	0,209
Decentralization in decision-making	11,952	12,429	12,667	13,692	0,072
Formalization	3,026	2,931	3,019	3,017	0,162
Degree of functional differentiation	2,930	3,013	3,022	3,213	0,705
Amount of functional departments	4,634	5,298	6,314	5,867	0,173
Total amount of product and service categories	9,098	7,955	59,680	26,200	0,208
Specialization	2,611	2,586	2,568	2,926	<b>0,024</b>
Share of highly educated employees	8,872	6,645	6,804	5,700	0,080
Slack resources: capital	3,605	3,412	3,549	3,056	0,544
Slack resources: educated employees	3,209	2,914	3,173	2,944	0,234
Slack resources: materials	3,907	3,931	3,827	3,333	0,986
Slack resources: talented managers	3,186	3,193	3,346	2,889	0,789
Organizational openness	3,659	3,565	3,431	3,538	<b>0,002</b>
The age of the company at the time of adoption	44,333	42,108	45,269		0,102

Instead significant differences were found in the level specialization between the adopter categories. The measurement scale for specialization was formed so, that the lower the values of the variable the more specialized the company. The late majority seems less specialized compared to other adopters, but the differences between the rests weren't very large. Also the comparison of the share of highly educated employees supports the differences in specialization, though difference in the share of highly educated employees wasn't significant.

The openness of the organization toward change and innovations differed between the adopter categories. Innovators naturally had the most open attitudes toward innovations and change in their company, and the early majority was the one that had the least open attitudes. The age of the company didn't differ across the categories.

### **11.3.4 Management Influence**

The managerial issues related to innovation adoption are under discussion next.

Managers in innovator companies were the most open toward change and innovations, whereas the managers in companies representing late majority were less open toward change and innovations.

**Table 11-5 Comparison of Managerial Issues between the Adopter Categories**

<i>Independent variable</i>	<i>Innovators</i>	<i>Early adopters</i>	<i>Early majority</i>	<i>Late majority</i>	<i>Sig.</i>
Managerial openness toward innovations	3,976	3,878	3,870	3,750	<b>0,003</b>
Management commitment in innovation adoption	3,452	3,270	3,278	2,925	0,522
Managerial strategic readiness	3,762	3,787	3,691	3,688	0,305
Share of highly educated managers	45,103	45,118	44,149	53,000	<b>0,033</b>
Management's years of employment in the company	11,086	12,845	14,294	12,600	0,497

The management commitment was the only variable from the managerial issues making contribution in the regression analysis, but didn't differ between the adopter categories. The same can be said for management's readiness to adopt innovations.

However, in the case of education of the management team, the mean comparison indicated significant differences. Somehow, the results give an implication to the opposite direction that could be suspected. The managers of late majority seemed to be more highly educated compared to companies in the other categories, which differ very slightly from each other. No difference existed, when a comparison was made about how long the management had been working in the company.

### **11.3.5 Environmental Characteristics**

Few differences were found when the environmental conditions were analyzed. There existed a slightly significant difference concerning the dynamism of the environment. The results indicated, that the late majority operated in more dynamic environment compared to others, and the differences between earlier and yet the true adopters were really small. Innovators seemed to operate in more uncertain and heterogeneous environment compared to others, with the exception that the environment of the late majority seemed to be the most heterogeneous.

**Table 11-6 Comparison of Environmental Characteristics between the Adopter Categories**

<i>Independent variable</i>	<i>Innovators</i>	<i>Early adopters</i>	<i>Early majority</i>	<i>Late majority</i>	<i>Sig.</i>
Dynamism	2,610	2,675	2,578	3,141	<b>0,054</b>
Uncertainty	3,286	3,060	3,176	3,156	<b>0,033</b>
Heterogeneity	3,077	2,873	2,967	3,283	<b>0,005</b>
Competition rate	3,976	3,974	4,031	3,647	0,280
Average amount of competitors	17,548	19,764	9,673	7,143	0,337
Amount of partners	18,625	11,481	11,511	10,800	0,155

Competition seems equal between the adopter categories as well as the amount of partners. Though it is interesting that the innovators had much larger amount of partners, but according to the analysis, this difference wasn't significant.

### 11.3.6 Information Behavior

At last, the differences in information behavior were analyzed. As it can be seen from Table 10-7, significant differences existed in how active the company and its employees are in information gathering and processing. Innovators behaved more actively in both of these dimensions. Innovator companies gather and process information more actively concerning their environment, new products and services, and their business field. They are continually seeking information that could help them to raise their productivity and competitive advantage. Also the employees in these companies are more actively seeking information about their professions and their company's business field and technologies. Other characteristics related to information behavior didn't separate the adopter categories.

**Table 11-7 Comparison of information behavior characteristics**

<i>Independent variable</i>	<i>Innovators</i>	<i>Early adopters</i>	<i>Early majority</i>	<i>Late majority</i>	<i>Sig.</i>
Activeness of information behavior among employees	3,357	3,221	3,239	3,314	<b>0,004</b>
Activeness of information behavior of the company	3,673	3,478	3,574	3,544	<b>0,004</b>
Formality of information behavior	2,393	2,447	2,594	2,647	0,666
Amount of website providers the company negotiated with	2,286	2,069	2,533		0,200
Amount of information received from different sources	19,889	19,674	20,574		0,507

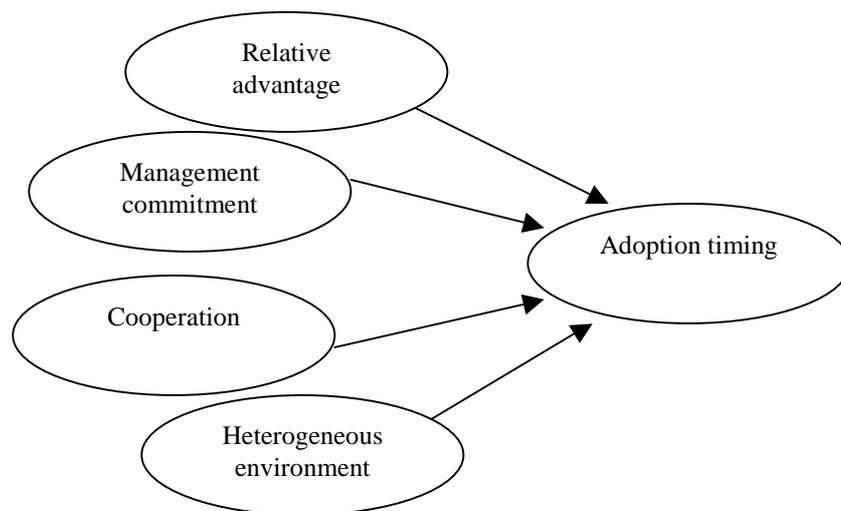
## 12 IMPLICATIONS

This chapter discusses the main implications of the present study. First, theoretical implications of literature and additional information received from the present study are discussed. Both the explanatory factors and the adopter categories are discussed from the theoretical point of view and then some proposals for further research are introduced. Finally, some managerial implications are discussed.

### *12.1 Theoretical Implications*

#### **12.1.1 Factors Affecting the Innovation Timing**

Theory suggests several factors affecting innovation adoption, but the present study found only three significant explaining factors for the timing of corporate internet page adoption (see Fig. 12-1). There were only previous studies, where few characteristics and their effect on organizational adoption were taken simultaneously into account. This is where the present study contributes the most, as the effects of different factors were studied all at the same time in the same model, capturing the whole process or phenomenon.



**Figure 12-1 Final Factors Effecting Adoption Timing**

However, the factors that were found non-significant might have strong effect on the factors that were found to affect the adoption timing. For instance, relative advantage had the strongest relationship with adoption timing, but again there might be some other characteristics that affect the perceptions of the relative advantage. For instance, active information gathering and processing might change the perceptions related to relative advantage.

The implications related to cooperation are in the same direction. For instance, some characteristics in the environment might spur the need for a company to cooperate and create networks, and that way become more exposed to new innovations. In general, active information behavior might be a natural consequence of networking.

The managers of the companies had been under discussion in many previous studies, but the dimensions of managerial influence discussed in the present study are rather different compared to previous literature. The present study took into account the managerial attitudes, as well as the strategic readiness and planning involved in the adoption process, without neglecting the fact that both, a successful adoption and implementation, need strong commitment from the managers participating the adoption process. All these are needed, but the regression revealed that only the commitment had a significant effect on the adoption timing. This may reflect the fact that the top management in companies made the decision concerning adoption of internet pages, and someone of the management team became the responsible person related to the websites. The strategic readiness of the management might be more crucial, when companies are acquiring innovations directly effecting to profitability and requiring high investments. The websites require at the minimum only one person to operate with them i.e. in the updating and content providing. Of course, the financial aspect arises at the beginning of the website implementation, since the appropriate hardware and software need to be obtained, however, this depends on the realization of the websites, i.e. whether they are made by the company itself or some other supplying company providing website services.

### **12.1.2 Innovation Adopter Categories in Organizational Research**

Based on the present study, the organizations can be categorized based on their innovativeness, though the concept of organizational innovativeness might have several dimensions. In the present study, the innovativeness was considered to consist of the three dimensions related to different timings during the adoption process. Many significant differences were found separating the innovators from the other adopters very clearly.

It must be admitted that categorizing organizations isn't necessary as easy as in consumer research. Few different types of organizations can be recognized based on the awareness and the adoption decision:

1. A company becomes soon aware of the innovation after it is launched and behaves in very innovative manner, when processing the information concerning the innovation, and adopts it relatively sooner than others.
2. A company can act in an innovative manner in the information gathering and thus become very soon aware of an innovation. But then the time it needed to process that information is long, and the decision to adopt is made much later compared to other companies.
3. A company that doesn't gather information very frequently from the surrounding environment becomes later aware of the innovations, but might process the information more effectively after receiving it, and eventually, makes the adoption decision immediately.
4. At last there are companies, which gather information less actively. After becoming aware of the innovations, they require a long processing time until the decision is made.

In addition to awareness and decision becomes the implementation. Companies have naturally different needs for the implementation due to the prestige of the innovation and its value to the company. The present study was able to capture three of these dimensions. The first were the innovators, which became sooner aware and adopted the corporate internet pages soon after they became aware of them. The second were the early adopters, which became aware of the websites almost at the same time as the innovators, but it took longer for them to accomplish the adoption decision. The third ones were the early majority, which became later aware of the websites, had shorter

information processing and decision-making period. In addition, the implementation was a longer process for innovators than the others.

### **12.1.3 Limitations and Further Research**

The present study included a few limitations. There exists a time lag between the innovation adoption timing and the measurement. This is also typical for the previous literature. The respondents were answering the questions based in their current knowledge, i.e. the perceived characteristics of the innovation might have been totally different at the time when the company first became aware of internet pages. Maybe the results of the present study could be validated with some other innovation that is just about to be launched.

The results may be different also due to the type of innovation. In the previous literature, the innovations have usually been something more related to technology, like manufacturing technologies, appliances and processes, and only few of the studies discussed information technology innovations, e.g. EDI and e-mail. In a way, it can be considered that maybe the adoption of infocom innovations like the websites, differs from other types of innovations. For instance, the hype around the internet and mobility may drive organizations to adopt innovations due to different reasons compared to innovations that directly affect the efficiency and productivity of companies. Thus, it can be concluded that the factors obtained explanatory by the present study were relevant for the adoption of websites. However, it is unknown how well these results can be generalized to other ICT-innovations. It can be suggested that more research is needed with other innovations.

The factors that effect the adoption of internet pages, should be studied in other business fields like the service sector, where there are more consumers as customers, there the factors that affect the adoption timing might be totally different.

Also some other method besides regression analysis should be applied to the modeling of the adoption timing, since there existed few variables highly correlating. These were non-significant for the adoption timing, but might affect the variables explaining the adoption timing. Another method could be for instance, the structural equation

modeling, which tries to explain the correlation matrix of the variables included in the model. The other analysis methods relate to the fact discussed earlier, that the explaining variables in the regression model might have strong relations with the non-significant variables in the present model.

Additionally, one field of interest should be those factors that affect the awareness of innovations and also which factors affect the implementation time. Additionally, it would be interesting to combine these, since the timing of awareness naturally affects the timing of the final adoption decision.

## ***12.2 Managerial Implications***

The present study proves that organizations can be categorized into adopter categories, which is important when marketers of new innovations target their marketing efforts and segment potential adopters. As the market segmentation is important for marketers, it is surprising that so little is known about functional and practical market segmentation and its appropriateness in marketing of innovations.

In both parts of the empirical study, i.e. the adoption timing and adopter categories, the perceived relative advantage had a strong relationship with both the adoption timing and the adopter categories. This means that if the marketer is able to raise the perceptions of the relative advantage of an innovation, the adoption may be fastened. It could be proposed that later adopters need more confirmation concerning the benefits of the innovation to make them sure that the adoption is worthwhile. Early adopters and the early majority perceived the internet pages less visible than the innovators and if the marketer would have made it clearer, that the internet pages are visible to the customers and other boundary groups, the adoption might have been faster. But this isn't critical for all companies, and thus the prestige and image attached to an innovation is also needed to make sure that the internet pages increase the companies image and general visibility, and thus the performance.

Based on the regression it can be said that corporate networks are one possible way to market new infocom innovations. The information moves faster, if the companies operate in a tight cooperation network, which might again affect the perceived relative

advantage, visibility and result demonstrability. If the marketer can show appropriate ways to measure the results related to websites, the perceptions of the result demonstrability arise as well as the perceived relative advantage.

For the marketer it is important to recognize the potential adopters. In the case of internet pages, the innovators were the largest firms when measured with the amount of personnel, and the early adopters were the smallest. This implies that a larger company becomes sooner aware of the innovations and makes the decision sooner. Correspondingly, if the late majority is discussed, they have quite high amount of personnel but measured with the turnover, they are much smaller. On the other hand, if the early majority is considered to behave in an innovative manner, they are large in both ways, so the decision is possible to make relatively soon after the awareness, and the financial situation grants a rapid implementation. As the innovators were larger companies, their management was the most open toward change, implying that they are continuously trying to find out new ways to improve their business.

The cluster analysis revealed that there is a time lag between awareness and the adoption decision, and the length of the time lag varies between adopter categories. The innovators and early majority are most ideal for the marketers of new innovations, as they adopt almost immediately, after becoming aware of the innovation. Marketers need to strengthen and target more efficiently their marketing messages at the time when early adopters are becoming aware of the innovation in order to shorten the time lag and decrease the uncertainty related to the innovation.

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**APPENDIX 1:**  
**THE SURVEY DOCUMENTS**

Appendix 1A: The cover letter  
Appendix 1B: The reminder letter  
Appendix 1C: The questionnaire

Jane Doe  
Firm XX  
Address

dd.mm.yyyy

**Arvoisa vastaanottaja,**

*Haluan kiittää Teitä siitä, että lupauduitte osallistumaan innovaatioiden omaksumista suomalaisissa yrityksissä käsittelevään tutkimukseeni.*

*Kyselytutkimuksen avulla kerään empiiristä aineistoa diplomityötäni varten. Diplomityöni on osa suurempaa tutkimushanketta: Tietoliikennealan innovaatioiden globaali diffuusio. Työni tarkoituksena on selvittää, mitkä tekijät vaikuttavat innovaatioiden omaksumiseen organisaatioissa. Tutkimuksessa käsitellään organisaatioiden ominaisuuksia, innovaatioiden ominaisuuksia sekä yrityksen ympäristöön liittyviä tekijöitä.*

*Sekä minä että työni ohjaaja projektipäällikkö Sanna Sundqvist haluamme korostaa, että olemme kiitollisia Teille siitä, että olette lupautunut osallistumaan tutkimukseen kiireisestä aikataulustanne huolimatta. Teidän mielipiteenne ja näkemyksenne ovat minulle ensiarvoisen tärkeitä ja mahdollistavat tieteellisen diplomityön laatimisen.*

*Toivoisin, että auttaisitte minua täyttämällä oheisen kysymyslomakkeen ja palauttamalla sen minulle oheisessa palautuskuoressa. Lomakkeen täyttäminen vie aikaa noin 20-30 minuuttia ja lomakkeen palauttaminen onnistuu helposti, sillä palautuskuoren postimaksu on maksettu valmiiksi. Vastauksenne on minulle tärkeä ja korkea vastausprosentti on edellytys tutkimustulosten luotettavuudelle. Kysely on täysin luottamuksellinen, vastauksenne eivät joudu ulkopuolisten käsiin, eikä yksittäisiä vastauksia voida tunnistaa aineistosta. Tutkimukseen on valittu kaikkiaan 511 suomalaista yritystä, hyödyntäen Bluebook –tietokantaa.*

*Jos haluatte yhteenvedon tutkimuksen tuloksista, laittakaa palautuskuoren mukana yhteystietonne, esimerkiksi käyntikortti. Mikäli Teillä on jotain kysyttävää, vastaan mielelläni kysymyksiinne ja kerron lisää tutkimuksesta. Puhelinnumeroni on 05-621 6657.*

*Ystävällisin terveisin ja etukäteen kiittäen,*

*Sanna Taalikka*

Jane Doe  
Firm XX  
Address

*dd.mm.yyyy*

*Arvoisa vastaanottaja*

*Soittaessani Teille noin kaksi viikkoa sitten lupauduitte osallistumaan innovaatioiden omaksumista suomalaisissa yrityksissä käsittelevään tutkimukseeni. Lähetin tuolloin Teille tutkimukseni kysymyslomakkeen. Mikäli olette jo täyttänyt ja palauttanut lomakkeen, pahoittelen tätä turhaa yhteydenottoa ja haluan kiittää Teitä lämpimästi vaivannäöstänne.*

*Mikäli Teillä ei ole vielä ollut sopivaa hetkeä kysymyslomakkeen täyttämiseen, haluaisin tässä yhteydessä muistuttaa, kuinka tärkeää minulle olisi saada Teidän vastauksenne. Vastauksellanne on hyvin suuri painoarvo diplomityöni kannalta.*

*Jos vastauslomake on jostain syystä kadonnut, lähetän Teille ohessa uuden lomakkeen. Sen täyttämiseen kuluu aikaa noin 20-30 minuuttia. Olisin kiitollinen mikäli voisitte täyttää lomakkeen ensi tilassa ja palauttaa sen minulle oheisessa kirjekuoressa, jonka postimaksu on jo puolestanne maksettu. Haluan korostaa, että vastauksenne käsitellään täysin luottamuksellisesti eikä yhdenkään yksittäisen vastaajan tietoja voida tunnistaa aineistosta.*

*Kyselytutkimuksen avulla kerään empiiristä aineistoa diplomityötäni varten. Diplomityöni on osa suurempaa tutkimushanketta: Tietoliikennealan innovaatioiden globaali diffuusio ([www.tbrc.fi](http://www.tbrc.fi)). Työni tarkoituksena on selvittää, mitkä tekijät vaikuttavat innovaatioiden omaksumiseen organisaatioissa. Tutkimuksessa käsitellään organisaatioiden ominaisuuksia, innovaatioiden ominaisuuksia sekä yrityksen ympäristöön liittyviä tekijöitä.*

*Mikäli haluatte yhteenvedon tutkimuksen tuloksista, laittakaa palautuskuoren mukana yhteystietonne, esimerkiksi käyntikortti. Mikäli Teillä on jotain kysyttävää, vastaan mielelläni kysymyksiinne ja kerron lisää tutkimuksesta. Puhelinnumeroni on 05-621 6657 ja sähköpostiosoitteeni on [sanna.taalikka@lut.fi](mailto:sanna.taalikka@lut.fi).*

*Ystävällisin terveisin ja etukäteen kiittäen,*

*Sanna Taalikka*



*Business Administration • Industrial Engineering and Management • Information Technology • Electrical Engineering*

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# INNOVAATIOIDEN OMAKSUMINEN ORGANISAATIOISSA

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Sanna Taalikka  
Diplomityöntekijä

Sanna Sundqvist  
Projektipäällikkö

## I TAUSTATIEDOT

1. Yrityksen nimi \_\_\_\_\_

2. Vastaaajan asema yrityksessä \_\_\_\_\_

3. Vastaaajan ikä? \_\_\_\_\_ vuotta

4. Vastaaajan koulutustaso?

- Perusasteen tutkinto (ammattikoulu tms.)                       Opistoasteen tutkinto (amk, insinööri, tms.)  
 Korkeakoulu- tai yliopistotutkinto                                       Jatkotutkinto (lisenssiaatti, tohtori)

## II ORGANISAATION OMINAISUUDET

1. Minä vuonna yrityksenne on perustettu? \_\_\_\_\_

2. Kuinka paljon yrityksellänne oli vakituisia työntekijöitä vuonna 2001? \_\_\_\_\_

3. Mikä oli yrityksenne liikevaihto vuonna 2001? \_\_\_\_\_ Mmk

4. Mitä toimialaa yrityksenne edustaa?

Mineraalien kaivu

Teollisuus

- Elintarvikkeiden, juomien ja tupakan valmistus  
 Tekstiilien ja vaatteiden valmistus  
 Nahan ja nahkatuotteiden valmistus  
 Puutavaran ja puutuotteiden valmistus  
 Massan jne. valmistus  
 Koksen, öljytuotteiden jne. valmistus  
 Kemikaalien, kemiallisten tuotteiden valmistus  
 Kumi- ja muovituotteiden valmistus  
 Ei-metallisten mineraalituotteiden valmistus  
 Perusmetallien, metallituotteiden valmistus  
 Koneiden ja laitteiden valmistus  
 Sähkötekniisten tuotteiden jne. valmistus  
 Kulkuneuvojen valmistus  
 Muu valmistus  
 Sähkö-, kaasu- ja vesihuolto  
 Rakentaminen  
 Muu, mikä? \_\_\_\_\_

Seuraavien kysymysten avulla pyritään hahmottamaan organisaationne rakenteellisia tekijöitä.

5. Mitkä alla mainituista ryhmistä osallistuvat seuraavia asioita käsitteleviin päätöksentekotilanteisiin?

	Työntekijät	Keskijohto	Toiminnalliset johtajat (jos yritys on jaettu osastoihin)	Yrityksen ylin johtotaso
5.1 Yrityksen budjetti	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Mainonta, markkinointi ja pakkaukset	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 Tuotteiden / palveluiden hinnoittelu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4 Uusien tuotteiden tai palveluiden lanseeraus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5 Yritysosotot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## APPENDIX 1C

5.6 Uudet markkinat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.7 Työntekijöiden palkkaaminen ja erottaminen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### **6. Miten hyvin seuraavat väittämät kuvaavat yrityksenne toimintatapoja? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä ja 5= täysin samaa mieltä.**

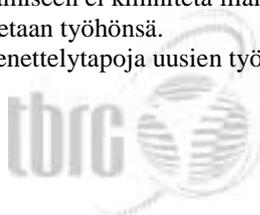
6.1 Työntekijöillämme on tarkat, kirjalliset työnkuvaukset.	1	2	3	4	5
6.2 Yrityksen toimintaperiaatteet ja menettelytavat ilmaistaan kirjallisesti.	1	2	3	4	5
6.3 Työntekijöiden toimista kerätään jatkuvasti tilastotietoja.	1	2	3	4	5
6.4 Yrityksemme on järjestäytynyt tarkan organisaatiokaavion mukaisesti.	1	2	3	4	5
6.5 Työntekijöille annettavat toiminnalliset ohjeet ovat aina kirjallisia.	1	2	3	4	5
6.6 Työntekijät ovat oman työnsä ”pomoja”.	1	2	3	4	5
6.7 Työntekijät tekevät omat päätöksensä itsenäisesti.	1	2	3	4	5
6.8 Työntekijät toimivat itse omien tapojensa mukaan.	1	2	3	4	5
6.9 Useimmat työntekijät saavat itse tehdä työohjeet ja säännöt.	1	2	3	4	5
6.10 Sääntöjen ja ohjeiden noudattamista seurataan erittäin tarkasti.	1	2	3	4	5
6.11 Ylin johto antaa ohjeistuksen suunnitelmista poikkeavissa tilanteissa.	1	2	3	4	5
6.12 Jos kaikki ei ole mennyt suunnitelmien mukaan, on epävarmaa kuka yrityksessä antaa ohjeita ja neuvoja.	1	2	3	4	5
6.13 Työntekijöitä kannustetaan osallistumaan eri päätöksentekotilanteisiin.	1	2	3	4	5
6.14 Työntekijät tekevät paljon itsenäisiä päätöksiä työssään.	1	2	3	4	5
6.15 Vain vähän toimenpiteitä voidaan tehdä ilman työnjohdon hyväksyntää.	1	2	3	4	5
6.16 Henkilöstöä kannustetaan tekemään itsenäisiä päätöksiä työssään.	1	2	3	4	5
6.17 Työntekijöiden täytyy pyytää neuvoja ylemmältä työnjohdolta pienissäkin ongelmatilanteissa.	1	2	3	4	5
6.18 Työntekijät tarvitsevat työtehtävissään toistuvasti ylemmän johdon hyväksyntää.	1	2	3	4	5
6.19 Työntekijöiden päätöksillä täytyy olla ylemmän johdon hyväksyntä.	1	2	3	4	5

### **7. Miten yrityksenne työntekijät jakautuvat koulutusasteittain?**

Peruskoulu / kansakoulu	_____ %
Ammattikoulu / lukio	_____ %
Ammattikorkeakoulu / opistotaso	_____ %
Korkeakoulu / yliopisto	_____ %
Lisensiaatti / tohtori	_____ %

### **8. Miten hyvin seuraavat väittämät kuvaavat yritystänne? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä.**

8.1 Työntekijöitä siirrellään usein yrityksen eri osastojen välillä.	1	2	3	4	5
8.2 Työntekijöiden siirtämiseen organisaation sisällä ei ole olemassa yleisiä menettelytapoja.	1	2	3	4	5
8.3 Yrityksessämme on tietyt työntekijät joka osastolle.	1	2	3	4	5
8.4 Palkatessamme uusia työntekijöitä valitsemme yksilöitä, jotka vastaavat täydellisesti tiettyjä asettamiamme kriteerejä.	1	2	3	4	5
8.5 Palkkaamiemme työntekijöiden osaamiseen ei kiinnitetä liian suurta huomiota palkatessa, vaan heidät koulutetaan työhönsä.	1	2	3	4	5
8.6 Yrityksessämme ei ole määritelty menettelytapoja uusien työntekijöiden palkkaamiseen.	1	2	3	4	5



9. Kuinka moneen erilliseen toiminnalliseen ja/tai hallinnolliseen yksikköön yrityksenne on jaettu?

\_\_\_\_\_ yksikköön

10. Kuinka monta erilaista tuote- ja / tai palveluryhmää yrityksellänne on?

\_\_\_\_\_ tuoteryhmää

\_\_\_\_\_ palveluryhmää

11. Miten eri tuote/palveluryhmät eroavat toisistaan seuraavien ominaisuuksien suhteen? Rengastakaa sopivin vaihtoehto siten, että 1=täysin erilaisia ja 5=täysin samanlaisia?

11.1 Käytettävät teknologiat	1	2	3	4	5
11.2 Tuotteiden / palveluiden markkinat (tarvittava markkinointistrategia)	1	2	3	4	5
11.3 Asiakkaat	1	2	3	4	5
11.4 Kilpailutilanne	1	2	3	4	5
11.5 Kustannukset	1	2	3	4	5

12. Tarkastellessanne yrityksenne resursseja, ympyröikää asteikolta 1-5 sopivin vaihtoehto kuvaamaan yrityksenne tilannetta siten, että 1=resursseja on niukasti tarjolla, 5=resursseja on runsaasti tarjolla.

12.1 Pääoma	1	2	3	4	5
12.2 Ammattitaitoinen työvoima	1	2	3	4	5
12.3 Materiaalit	1	2	3	4	5
12.4 Osaavat johtajat	1	2	3	4	5

13. Miten hyvin seuraavat väittämät kuvaavat yrityksessänne yleisesti vallitsevia asenteita? Ympyröikää sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä.

13.1 Yrityksemme osallistuu vain pieniä riskejä sisältäviin projekteihin.	1	2	3	4	5
13.2 Yrityksemme suhtautuu avoimesti uusiin tuotteisiin ja palveluihin.	1	2	3	4	5
13.3 Yrityksessämme uskotaan uusien tuotteiden ja palveluiden tuovan tehokkuutta yrityksemme toimintaan.	1	2	3	4	5
13.4 Yrityksemme on perinteisesti ollut toimialallaan edelläkävijä uusien tuotteiden ja teknologioiden kokeilemisessa.	1	2	3	4	5
13.5 Yrityksessämme suhtaudutaan avoimesti ympäristössä tapahtuviin muutoksiin.	1	2	3	4	5
13.6 Teknologiaan muutoksiin suhtaudutaan ennakkoluulottomasti.	1	2	3	4	5
13.7 Työntekijämme sopeutuvat nopeasti teknologisiin muutoksiin.	1	2	3	4	5
13.8 Teknologiset muutokset nähdään yrityksessämme haasteellisina.	1	2	3	4	5

### III TUOTTEEN OMINAISUUDET

#### Yrityksen internet –sivut

1. Onko yrityksellänne omat internet –kotisivut?

- Kyllä, yrityksellämme on omat internet-sivut.
- Kyllä, olemme parhaillaan kokeilemassa uusia korvaavia internet-sivuja.



## APPENDIX 1C

- Olemme tällä hetkellä kokeilemassa ensimmäisten internet-sivujen toimintaa.
- Ei, mutta olemme kuulleet internet –sivuista ja suunnittelemme sellaisten hankkimista yrityksellemme.
- Olemme tietoisia internetistä, mutta emme aio hankkia yrityksellemme omia kotisivuja.
- Emme ole koskaan kuulleetkaan internet –sivuista. (Mikäli vastasitte tähän, siirtykää kysymykseen 9.)

**2. Milloin yritys kuuli internet-sivuista ensimmäisen kerran? Mikäli yrityksellänne ei ole internet-sivuja siirtykää tämän jälkeen kysymykseen 7.**

Vuonna \_\_\_\_\_

**3. Milloin tehtiin päätös ensimmäisten internet-sivujen hankkimisesta?**

Vuonna \_\_\_\_\_

**4. Milloin internet-sivujen voitiin katsoa kuuluvan osaksi yrityksen päivittäisiä rutiineja?**

Vuonna \_\_\_\_\_

**5. Miten internet-sivujen toteutus on tapahtunut?**

- Yrityksemme tekee itse omat kotisivunsa.
- Osa sivuista on toteutettu itse ja osa on hankittu ulkopuoliselta toimittajalta.

Nykyisen toimittajan nimi \_\_\_\_\_

- Olemme hankkineet koko sivuston ulkopuoliselta toimittajalta.

Nykyisen toimittajan nimi \_\_\_\_\_

**6. Mikäli yrityksenne on vaihtanut internet-sivujen toimittajaa, milloin tämä päätös tehtiin? Siirtykää tämän jälkeen kysymykseen 8.**

Vuonna \_\_\_\_\_

**7. Mikäli ette ole vielä hankkineet tai ole lainkaan hankkimassa internet-sivuja, miten hyvin seuraavat väittämät pitävät paikkansa? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä.**

*Emme ole vielä hankkineet / ole lainkaan hankkimassa internet –sivuja yrityksellemme, koska...*

...internet-sivujen hankkiminen ja niiden käyttöönotto vie liikaa aikaa.	1	2	3	4	5
...internet-sivujen hankkiminen ei lisää yrityksemme tehokkuutta.	1	2	3	4	5
...internet-sivut ovat teknologian puolesta liian monimutkaisia.	1	2	3	4	5
...internet-sivut eivät sovi yrityksellemme.	1	2	3	4	5
...olemme huolissamme tietoturvasta.	1	2	3	4	5
... pidämme internet-sivuja liian kalliina.	1	2	3	4	5
... yrityksessämme ei ole sopivaa henkilöä, joka pystyisi ottamaan internet-sivut vastuulleen.	1	2	3	4	5

**8. Miten hyvin seuraavat väittämät pitävät paikkansa, kun tarkastelette internet-sivujen ominaisuuksia? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä. Mikäli yrityksellänne ei ole omia internet-sivuja, miten samaa tai eri mieltä olisitte alla olevien väittämien kanssa, jos yrityksellänne olisi internet-sivut?**

8.1 Internet-sivujen avulla saadaan tehokkuutta tiedonkulkuun.	1	2	3	4	5
8.2 Internet-sivujen avulla asiakkaiden palvelu parantuu.	1	2	3	4	5
8.3 Asiakastyytyväisyys lisääntyy.	1	2	3	4	5
8.4 Tietoa on aina saatavilla paikasta riippumatta.	1	2	3	4	5
8.5 Internet-sivujen välityksellä olemme paremmin asiakkaiden	1	2	3	4	5



tavoitettavissa.					
8.6 Internet-sivut parantavat yrityskuvaamme.	1	2	3	4	5
8.7 Internet-sivumme ovat yhteensopivia kaikkien selainten kanssa.	1	2	3	4	5
8.8 Internet-sivujamme voi käyttää helposti eri laitteilla (PC, matkapuhelin, PDA)	1	2	3	4	5
8.9 Internet-sivujen ansiosta asiakaspalvelumme on nopeampaa.	1	2	3	4	5
8.10 Yrityksemme saavuttaa huomattavan kilpailuedun internet-sivujen ansiosta.	1	2	3	4	5
8.11 Internet-sivujen avulla yrityksestämme saa hyvän yleiskuvan.	1	2	3	4	5
8.12 Yrityksemme tunnettuus on parantunut internet-sivujen hankinnan jälkeen.	1	2	3	4	5
8.13 Internet-sivujen avulla saavutettu hyöty on selkeästi havaittavissa.	1	2	3	4	5
8.14 Kehumme internet-sivujamme muille yrityksille.	1	2	3	4	5
8.15 Pystyimme testaamaan internet-sivuja ennen lopullisen hankintapäätöksen tekemistä.	1	2	3	4	5
8.16 Testasimme usean eri toimittajan tarjoamia vaihtoehtoja.	1	2	3	4	5
8.17 Internet-sivut parantavat yrityksemme imagoa.	1	2	3	4	5
8.18 Yrityksen arvostus muihin yrityksiin nähden kasvaa internet-sivujen avaamisen myötä.	1	2	3	4	5
8.19 Internet-sivujen hankinnasta aiheutuva taloudellinen riski on erittäin pieni.	1	2	3	4	5
8.20 Olemme havainneet muidenkin yritysten kannattavan omien kotisivujen hankintaa.	1	2	3	4	5
8.21 Internet-sivujen avulla yritykset voivat selkeästi parantaa näkyvyyttään.	1	2	3	4	5
8.22 Internet-sivujen toteutusta pidetään liian vaikeana.	1	2	3	4	5
8.23 Internet-sivujen päivitys koetaan hankalaksi.	1	2	3	4	5
8.24 Internet-sivuillamme on hyvä toimintavarmuus.	1	2	3	4	5
8.25 Internet-sivumme sopivat hyvin yrityksessämme vallitseviin asenteisiin.	1	2	3	4	5
8.26 Internet-sivut mahdollistavat yrityksen laajemman näkyvyyden.	1	2	3	4	5
8.27 Yleisesti ottaen, internet-sivut lisäävät yrityksen kilpailukykyä.	1	2	3	4	5
8.28 Yrityksemme saa uusia asiakaskontakteja internet-sivujen ansiosta.	1	2	3	4	5

## Dokumentinhallintajärjestelmä

### 9. Onko yrityksellänne käytössä dokumentinhallintajärjestelmä?

- Kyllä, yrityksellämme on käytössä dokumentinhallintajärjestelmä.
- Olemme kokeilemassa tällä hetkellä uuden dokumentinhallintajärjestelmän toimintaa.
- Ei, mutta olemme kuulleet dokumentinhallintajärjestelmistä ja suunnittelemme sellaisen hankkimista yrityksellemme.
- Olemme tietoisia dokumentinhallintajärjestelmistä, mutta emme aio hankkia sellaista yrityksellemme.
- Emme ole koskaan kuulleetkaan dokumentinhallintajärjestelmistä. (Mikäli valitsitte tämän vaihtoehdon, siirtykää seuraavaan osioon ostopäätökset.)

### 10. Milloin yritys kuuli dokumentinhallintajärjestelmästä ensimmäisen kerran? Mikäli yrityksellänne ei ole dokumentinhallintajärjestelmää, siirtykää tämän jälkeen kysymykseen 15.

Vuonna \_\_\_\_\_

### 11. Milloin tehtiin päätös ensimmäisen dokumentinhallintajärjestelmän hankkimisesta?

Vuonna \_\_\_\_\_

### 12. Milloin dokumentinhallintajärjestelmän voitiin katsoa kuuluvan osaksi yrityksen päivittäisiä rutiineja?



## APPENDIX 1C

Vuonna \_\_\_\_\_

### 13. Miten dokumentinhallintajärjestelmän toteutus on tapahtunut?

- Yrityksemme kehitti itse oman dokumentinhallintajärjestelmän.
- Osa järjestelmästä on toteutettu itse ja osa on hankittu ulkopuoliselta toimittajalta.

Toimittajan nimi \_\_\_\_\_

- Olemme hankkineet koko dokumentinhallintajärjestelmän ulkopuoliselta toimittajalta.

Toimittajan nimi \_\_\_\_\_

### 14. Mikäli yrityksenne on vaihtanut dokumentinhallintajärjestelmän toimittajaa, milloin tämä päätös tehtiin? Siirrykää tämän jälkeen kysymykseen 16.

Vuonna \_\_\_\_\_

### 15. Mikäli ette ole hankkineet tai ole lainkaan hankkimassa dokumentinhallintajärjestelmää, miten hyvin seuraavat väittämät pitävät paikkansa? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä.

Emme ole hankkineet dokumentinhallintajärjestelmää yrityksellemme, koska...					
...sen hankkiminen ja käyttöönotto vie liikaa aikaa.	1	2	3	4	5
...sen hankkiminen ei lisää yrityksemme tehokkuutta.	1	2	3	4	5
...se on teknologian puolesta liian monimutkaisia.	1	2	3	4	5
...se ei sovellu yrityksellemme.	1	2	3	4	5
...se on yrityksellemme liian kallista.	1	2	3	4	5

### 16. Miten samaa tai eri mieltä olette seuraavista väittämistä, kun ajattelette yrityksenne käyttämää dokumentinhallintajärjestelmää? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä. Mikäli yrityksellänne ei ole dokumentinhallintajärjestelmää, miten samaa tai eri mieltä olisitte alla olevien väittämien kanssa, jos yrityksellänne olisi kyseinen järjestelmä?

16.1 Dokumentinhallintajärjestelmän avulla työtehtäviä voidaan suorittaa nopeammin.	1	2	3	4	5
16.2 Dokumentinhallintajärjestelmän käyttö parantaa työn laatua.	1	2	3	4	5
16.3 Dokumentinhallintajärjestelmä helpottaa työtehtäviä.	1	2	3	4	5
16.4 Dokumentinhallintajärjestelmä parantaa suorituskykyä työtehtävissä.	1	2	3	4	5
16.5 Dokumentinhallintajärjestelmä vaikuttaa positiivisesti työnteon tehokkuuteen.	1	2	3	4	5
16.6 Dokumentinhallintajärjestelmän käyttö sopii hyvin yhteen työntekijöiden työasenteiden kanssa.	1	2	3	4	5
16.7 Dokumentinhallintajärjestelmä sopii työntekijöiden nykyisiin työtilanteisiin erittäin hyvin.	1	2	3	4	5
16.8 Dokumentinhallintajärjestelmä on yhteensopiva yrityksen nykyisten laitteistojen ja ohjelmistojen kanssa.	1	2	3	4	5
16.9 Dokumentinhallintajärjestelmä sopii erittäin hyvin työntekijöiden työtapoihin.	1	2	3	4	5
16.10 Dokumentinhallintajärjestelmän käyttö parantaa yrityksen imagoa.	1	2	3	4	5
16.11 Muut työntekijät arvostavat dokumentinhallintaa käyttäviä työntekijöitä.	1	2	3	4	5
16.12 Dokumentinhallintajärjestelmän käyttö on helppoa.	1	2	3	4	5
16.13 Dokumentinhallintajärjestelmän käyttötavat muistetaan helposti.	1	2	3	4	5
16.14 Dokumentinhallintajärjestelmän käyttäminen on turhauttavaa työntekijöille.	1	2	3	4	5
16.15 Yrityksen työntekijät oppivat helposti käyttämään dokumentinhallintajärjestelmää.	1	2	3	4	5



16.16 Kehumme käyttämäämme dokumentinhallintajärjestelmää muille yrityksille.	1	2	3	4	5
16.17 Dokumentinhallintajärjestelmien avulla saavutetut hyödyt ovat selvästi havaittavissa.	1	2	3	4	5
16.18 Olemme havainneet muidenkin yritysten käyttävän dokumentinhallintajärjestelmää.	1	2	3	4	5
16.19 Yrityksen sisällä dokumentinhallintajärjestelmän käyttö on erittäin selvästi esillä.	1	2	3	4	5
16.20 Yrityksellämme on ollut erittäin hyvät mahdollisuudet kokeilla erilaisten dokumentinhallintajärjestelmien käyttöä.	1	2	3	4	5
16.21 Dokumentinhallintajärjestelmillä on yleisesti hyvä kokeiltavuus.	1	2	3	4	5
16.22 Yrityksemme on tietoinen siitä, miten voimme kokeilla dokumentinhallintajärjestelmiä.	1	2	3	4	5
16.23 Yrityksemme pystyi kunnolla kokeilemaan dokumentinhallintajärjestelmän toimintaa, ennen lopullista hankintapäätöstä.	1	2	3	4	5
16.24 Työntekijöidemme on pakko kokeilla dokumentinhallintajärjestelmien kanssa työskentelyä.	1	2	3	4	5
16.25 Yrityksen johto odottaa työntekijöiden käyttävän dokumentinhallintajärjestelmää.	1	2	3	4	5
16.26 Dokumentinhallintajärjestelmän käyttö on vapaaehtoista työntekijöille.	1	2	3	4	5
16.27 Keskijohto vaatii työntekijöitään käyttämään dokumentinhallintajärjestelmiä.	1	2	3	4	5
16.28 Dokumentinhallintajärjestelmän hankintaan liittyvät taloudelliset riskit ovat pieniä.	1	2	3	4	5
16.29 Dokumentinhallintajärjestelmää pidetään toiminnallisesti luotettavana.	1	2	3	4	5

**17. Mitkä seuraavista myynninedistämiskeinoista olivat selvästi tunnistettavissa, kun yrityksellenne markkinoitiin eri tuotteita? Rastittakaa se tuote, jonka kohdalla ko. tekijä oli selkeästi havaittavissa.**

	Internet-sivut	Dokumentinhallinta
Henkilökohtainen myyntityö	<input type="checkbox"/>	<input type="checkbox"/>
Suora postimainonta	<input type="checkbox"/>	<input type="checkbox"/>
Messut ja näyttelyt	<input type="checkbox"/>	<input type="checkbox"/>
Tuotteen ominaisuuksien kuvaaminen	<input type="checkbox"/>	<input type="checkbox"/>
Tuotteen hinta markkinointikeinona	<input type="checkbox"/>	<input type="checkbox"/>
Tuotteen yhdistäminen yrityksen muihin järjestelmiin	<input type="checkbox"/>	<input type="checkbox"/>

## IV OSTOPÄÄTÖKSET

**Tässä osiossa tarkastellaan internet-sivujen ja dokumentinhallintajärjestelmän ostopäätöksiä. Vastatkaa alla oleviin kysymyksiin sen tuotteen osalta, jonka olette jo hankkineet. Mikäli yrityksenne ei ole tehnyt hankintapäätöstä kummastakaan tuotteesta, siirtykää seuraavaan osioon informaation lähteet.**

### 1. Kuinka monta henkilöä osallistui

a) internet-sivujen hankintapäätökseen? \_\_\_\_\_ henkilöä

b) dokumentinhallintajärjestelmän hankintapäätökseen? \_\_\_\_\_ henkilöä

**2. Keitä yrityksessänne osallistui tuotteiden ostopäätöksiin? Merkitkää kunkin henkilön rooli organisaatiossa (esim. toimitusjohtaja, ostopäällikkö). Millainen painoarvo kullakin henkilöllä oli tuotteen ostopäätöstä tehtäessä? Arvioikaa painoarvo niin, että jaatte luvun 100 päätöksentekoon**

APPENDIX 1C

*osallistuneiden henkilöiden kesken niin, että luku kuvaa henkilön painoarvoa päätöksenteossa. Merkitkää painoarvo sen tuotteen kohdalle, jonka ostopäätöksessä kyseinen henkilö oli mukana.*

*Esim.*

	<u>Henkilön rooli</u>	<u>Painoarvo</u>	
<b>Henkilö 1</b>	Toimitusjohtaja	Internet 90%	Dokum.hallinta 0%
<b>Henkilö 2</b>	Ostopäällikkö	10%	50%

**Henkilön painoarvo hankinta-päätöksessä (1-100)**

	<u>Henkilön rooli organisaatiossa</u>	<u>Internet</u>	<u>Dokumentin-hallinta</u>
<b>Henkilö 1</b>	_____	_____	_____
<b>Henkilö 2</b>	_____	_____	_____
<b>Henkilö 3</b>	_____	_____	_____
<b>Henkilö 4</b>	_____	_____	_____
<b>Henkilö 5</b>	_____	_____	_____
<b>Henkilö 6</b>	_____	_____	_____
<b>Henkilö 7</b>	_____	_____	_____

**3. Miten hyvin seuraavat väittämät kuvaavat kunkin henkilön roolia päätöksen teossa? Kirjoittakaa sarakkeisiin numerot 1-5 jokaiselle henkilölle suhteessa siihen, miten hyvin kyseinen väittämä kuvaa henkilön roolia uuden tuotteen ostopäätöksenteossa siten, että 1=kuvaa erittäin huonosti, 5=kuvaa erittäin hyvin kyseessä olevaa henkilöä.**

	<u>Henkilö 1</u>	<u>Henkilö 2</u>	<u>Henkilö 3</u>	<u>Henkilö 4</u>	<u>Henkilö 5</u>	<u>Henkilö 6</u>	<u>Henkilö 7</u>
Käyttää tuotetta päivittäin työtehtävissään.	_____	_____	_____	_____	_____	_____	_____
On virallisesti vastuussa tuotteen ostotoiminnosta.	_____	_____	_____	_____	_____	_____	_____
Yrittää vaikuttaa päätöksenteon lopputulokseen omilla mielipiteillään.	_____	_____	_____	_____	_____	_____	_____
Tekee viime kädessä päätöksen valittujen vaihtoehtojen keskuudesta.	_____	_____	_____	_____	_____	_____	_____
Hallinnoi informaation kulkua päätöksentekoprosessin aikana.	_____	_____	_____	_____	_____	_____	_____

**4. Miten hyvin seuraavat väittämät kuvaavat tuotteen ostopäätöstä tehneen ryhmän toimintaa tuotekohtaisesti? Ympyröikää sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä.**

	<u>Internet-sivut</u>					<u>Dokumentinhallinta</u>				
4.1 Ryhmän jäsenet tekivät yhdessä ”tiimityötä”.	1	2	3	4	5	1	2	3	4	5
4.2 Jotkut ryhmän jäsenistä olivat aina samaa mieltä tiettyjen henkilöiden kanssa.	1	2	3	4	5	1	2	3	4	5
4.3 Ryhmän jäsenten välillä oli kinastelua.	1	2	3	4	5	1	2	3	4	5
4.4 Ryhmän jäsenet olivat taipuvaisia juonitteluun toisiaan vastaan.	1	2	3	4	5	1	2	3	4	5
4.5 Muut toiminnalliset ryhmät	1	2	3	4	5	1	2	3	4	5

häiritsivät ja puuttuivat ostopäätösryhmän toimintaan.										
4.6 Ryhmän jäsenet tunsivat toisensa hyvin.	1	2	3	4	5	1	2	3	4	5
4.7 Ryhmän jäsenet olivat tunteneet toisensa jo pitkään.	1	2	3	4	5	1	2	3	4	5
4.8 Ryhmän jäsenet tunsivat toistensa työskentelytavat.	1	2	3	4	5	1	2	3	4	5
4.9 Tietyt henkilöt ryhmässä olivat vihamielisiä toisilleen.	1	2	3	4	5	1	2	3	4	5

## V INFORMAATIOLÄHTEET

### 1. Miten yrityksenne kuuli ensimmäisen kerran tuotteesta?

Internet	Dokum. hallinta	
<input type="checkbox"/>	<input type="checkbox"/>	Mainonnan välityksellä
<input type="checkbox"/>	<input type="checkbox"/>	Kilpailijoiden kautta
<input type="checkbox"/>	<input type="checkbox"/>	Yhteistyökumppaneiden kautta
<input type="checkbox"/>	<input type="checkbox"/>	Toimittajan myyntihenkilö otti yhteyttä
<input type="checkbox"/>	<input type="checkbox"/>	Internetistä
<input type="checkbox"/>	<input type="checkbox"/>	Messuilla

Jotenkin muuten, miten?

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**Vastatkaa seuraaviin kysymyksiin sen mukaan, onko yrityksenne tehnyt päätöstä internetsivujen tai dokumentinhallintajärjestelmän hankkimisesta. Mikäli yrityksenne ei ole tehnyt hankintapäätöstä kummastakaan tuotteesta, siirtykää kysymykseen 6.**

2. **Kuinka monen eri toimittajan kanssa yrityksenne kävi neuvotteluja, kun hankitte internet-sivuja?** \_\_\_\_\_ toimittajan kanssa  
**dokumentinhallintajärjestelmää?** \_\_\_\_\_ toimittajan kanssa

3. **Arvioi kuinka monta yhteistä kokousta tai neuvottelua yrityksellänne oli tuotteiden toimittajien kanssa?**

\_\_\_\_\_ neuvottelua internet-sivujen toimittajan kanssa.

\_\_\_\_\_ neuvottelua dokumentinhallintajärjestelmän toimittajan kanssa.

4. **Kuinka tärkeitä seuraavat tiedonlähteet olivat, kun teitte hankintapäätöstä? Rengastakaa sopivin vaihtoehto kunkin tuotteen kohdalla siten, että 1=ei lainkaan tärkeä, 5=erittäin tärkeä.**

	Internet –sivut					Dokumentinhallinta				
Lehtimainokset	1	2	3	4	5	1	2	3	4	5
Lehti uutiset	1	2	3	4	5	1	2	3	4	5
Toimittajayritysten myyntihenkilöt	1	2	3	4	5	1	2	3	4	5
Tuotteen esitteet	1	2	3	4	5	1	2	3	4	5
Messut	1	2	3	4	5	1	2	3	4	5
Internet	1	2	3	4	5	1	2	3	4	5



## APPENDIX 1C

Kilpailijat	1	2	3	4	5	1	2	3	4	5
Yhteistyökumppanit	1	2	3	4	5	1	2	3	4	5

**5. Kuinka tärkeitä seuraavat tiedonlähteet olivat, kun valitsitte tuotteen toimittajaa? Rengastakaa sopivin vaihtoehto kunkin tuotteen kohdalla siten, että 1=ei lainkaan tärkeä, 5=erittäin tärkeä.**

	Internet –sivut					Dokumentinhallinta				
Lehtimainokset	1	2	3	4	5	1	2	3	4	5
Lehti uutiset	1	2	3	4	5	1	2	3	4	5
Toimittajayritysten myyntihenkilöt	1	2	3	4	5	1	2	3	4	5
Tuotteen esitteet	1	2	3	4	5	1	2	3	4	5
Messut	1	2	3	4	5	1	2	3	4	5
Internet	1	2	3	4	5	1	2	3	4	5
Kilpailijat	1	2	3	4	5	1	2	3	4	5
Yhteistyökumppanit	1	2	3	4	5	1	2	3	4	5

**6. Miten hyvin seuraavat väittämät kuvaavat yritystänne? Rengastakaa sopivin vaihtoehto siten, että 1=täysin eri mieltä, 5=täysin samaa mieltä.**

6.1 Yrityksemme työntekijät vaihtavat keskuudessaan aktiivisesti tietoa ja ideoita.	1	2	3	4	5
6.2 Yrityksessämme tiedon kulku tapahtuu vain virallisia kanavia pitkin.	1	2	3	4	5
6.3 Yrityksessämme tietoa kulkee eniten epävirallisia kanavia pitkin.	1	2	3	4	5
6.4 Yrityksemme kerää jatkuvasti palautetta asiakkailtaan.	1	2	3	4	5
6.5 Yrityksemme seuraa toisissa yrityksissä tapahtuvia teknologisia muutoksia.	1	2	3	4	5
6.6 Kilpailijoiden toimenpiteitä ja menettelytapoja seurataan täsmällisesti.	1	2	3	4	5
6.7 Kilpailijatiedon hankkiminen on systemaattista.	1	2	3	4	5
6.8 Yrityksemme kerää oman alansa erikoiskirjallisuutta.	1	2	3	4	5
6.9 Kehotamme työntekijöitä lukemaan toimialaa koskevia julkaisuja.	1	2	3	4	5

## VI YRITYSJOHTO JA INNOVAATIOT

**1. Miten hyvin seuraavat väittämät kuvaavat yrityksenne johtotason asennoitumista uusista tuotteista ja palveluista kohtaan? Ympyröikää sopivin vaihtoehto asteikolta 1-5 siten, että 1=täysin eri mieltä ja 5=täysin samaa mieltä.**

1.1 Yrityksen ylin johto suhtautuu myönteisesti teknologisiin muutoksiin.	1	2	3	4	5
1.2 Yrityksen ylin johto pitää uusien tuotteiden ja palveluiden omaksumista erittäin tärkeänä.	1	2	3	4	5
1.3 Yritysjohdolla on valmis tekemään muutoksia organisaatiossa sopeutuakseen ympäristön muutoksiin.	1	2	3	4	5
1.4 Yrityksen johtotaso on valmis hyväksymään organisaation rakenteessa tapahtuvia muutoksia.	1	2	3	4	5
1.5 Yrityksen johtohenkilöt ovat kiinnostuneita uusista teknologioista.	1	2	3	4	5
1.6 Yritysjohdolla on halukas tekemään suuria investointeja uusiin tuotteisiin ja teknologioihin.	1	2	3	4	5
1.7 Yrityksemme johtohenkilöt etsivät aktiivisesti uusia keinoja tehokkuuden parantamiseen.	1	2	3	4	5



1.8 Innovaatioiden omaksumisen taustalla ei ole strategista suunnittelua.	1	2	3	4	5
1.9 Uusia tuotteita hankittaessa kiinnitetään huomiota vain tarjoutuneeseen mahdollisuuteen.	1	2	3	4	5
1.10 Uusien tuotteiden ostopäätöksen pohjana on houkutteleva tarjous.	1	2	3	4	5
1.11 Uusien tuotteiden taustalla olevaan tekniikkaan ei tutustuta tarpeeksi.	1	2	3	4	5
1.12 Resurssien puute on hidastanut uusien tuotteiden hankintaa.	1	2	3	4	5
1.13 Innovaatioiden käyttöönottovaiheeseen pyritään kiinnittämään mahdollisimman vähän resursseja.	1	2	3	4	5
1.14 Johtotason henkilöt sitoutuvat mahdollisimman vähän innovaatioiden hankintaan.	1	2	3	4	5
1.15 Innovaatioiden käyttöönottoon ei hankita lisäresursseja.	1	2	3	4	5
1.16 Käytämme ulkopuolisia asiantuntijoita kontrolloimaan resurssijamme innovaatioita hankittaessa.	1	2	3	4	5

2. Mikä on yrityksenne ylimpien johtohenkilöiden keski-ikä (noin)? \_\_\_\_\_ vuotta

3. Kuinka monta prosenttia yrityksenne ylemmistä johtohenkilöistä omaa seuraavanlaisen koulutuksen?

Peruskoulu / kansakoulu	_____ %
Ammattikoulu / lukio	_____ %
Ammattikorkeakoulu / opistotaso	_____ %
Korkeakoulu / yliopisto	_____ %
Lisensiaatti / tohtori	_____ %

4. Kuinka kauan nykyinen ylin johto on ollut yrityksen palveluksessa (keskimäärin)? \_\_\_\_\_ vuotta

## VII YMPÄRISTÖ

1. Miten hyvin seuraavat väittämät kuvaavat yritystänne? Ympyröikää sopivin vaihtoehto asteikolta 1-5 siten, että 1=täysin eri mieltä ja 5=täysin samaa mieltä.

1.1 Toimialallamme tuotteet vanhentuvat nopeasti.	1	2	3	4	5
1.2 Yrityksemme täytyy muuttaa jatkuvasti markkinointikeinoja säilyttääkseen markkina- ja kilpailuasemansa.	1	2	3	4	5
1.3 Kilpailijoiden toimia on helppo ennustaa.	1	2	3	4	5
1.4 Kysyntätekiijät ovat helposti ennustettavissa toimialallamme.	1	2	3	4	5
1.5 Tuotantomenetelmät muuttuvat usein toimialallamme.	1	2	3	4	5
1.6 Asiakkaiden tarpeet muuttuvat ajan myötä.	1	2	3	4	5
1.7 Uusien asiakkaiden tarpeet poikkeavat usein nykyisten asiakkaiden tarpeista.	1	2	3	4	5
1.8 Asiakkaamme etsivät koko ajan uusia tuotteita / palveluja.	1	2	3	4	5
1.9 Olemme havainneet muutoksia siinä, minkälaisia tuotteita / palveluita asiakkaamme haluavat.	1	2	3	4	5
1.10 Yrityksemme toiminta on erittäin monipuolista ja toiminta keskittyy useille erilaisille markkinoille.	1	2	3	4	5
1.11 Toimintaympäristössämme on suuria uhkia yrityksemme toiminnalle.	1	2	3	4	5
1.12 Kilpailijoiden toimiin pystytään reagoimaan toimialallamme erittäin nopeasti.	1	2	3	4	5
1.13 Toimialallamme kilpailu on erittäin kireää.	1	2	3	4	5
1.14 Kilpailu tuotteiden ja palveluiden laadulla on yrityksellemme merkittävä	1	2	3	4	5



## APPENDIX 1C

haaste.

1.15 Toimialallemme on tyypillistä kova hintakilpailu.	1	2	3	4	5
1.16 Toimialamme yritykset tuovat jatkuvasti uusia tuotteita ja palveluita markkinoille.	1	2	3	4	5
1.17 Toimialallemme on pulaa osaavasta työvoimasta.	1	2	3	4	5
1.18 Valtiohallinnon toimenpiteet säätelevät toimialaamme.	1	2	3	4	5
1.19 Uusista kilpailijoiden toimista saadaan kuulla lähes päivittäin.	1	2	3	4	5
1.20 Samoilla markkinoilla toimivat kilpailijat ovat suhteellisen heikkoja.	1	2	3	4	5
1.21 Toimialamme teknologinen kehitys on nopeaa.	1	2	3	4	5
1.22 Teknologinen kehitys tuo mukanaan huomattavia mahdollisuuksia toimialallemme.	1	2	3	4	5
1.23 Toimialamme teknologiset läpimurrot ovat mahdollistaneet lukemattomien uusien tuoteideoiden toteuttamisen.	1	2	3	4	5
1.24 Teknologinen kehitys alallamme on melko vähäistä.	1	2	3	4	5

**2. Arvioikaa kuinka monta kilpailijaa yrityksellänne on keskimäärin tuote/palveluryhmää kohden?**

\_\_\_\_\_ kilpailijaa

**3. Arvioikaa kuinka monta yhteistyökumppania (strategisia partnereita) yrityksellänne on?**

\_\_\_\_\_ yhteistyöyrittäjä

**KIITOS VASTAUKSESTANNE!**



**APPENDIX 2:**  
**THE STATEMENTS IN THE MEASURE SCALES**

**STATEMENTS AND THEIR MEASUREMENT CONSTRUCTS**

*Innovation characteristics*

Relative advantage (6)

1. Internet-sivujen avulla saadaan tehokkuutta tiedonkulkuun. *The internet pages make information processing more effective.* (Relative advantage 1)
2. Internet-sivujen avulla asiakkaiden palvelu on parantunut. *Customer service has improved due to the internet pages.* (Relative advantage 2)
3. Asiakastyytyväisyys on lisääntynyt. *Customer satisfaction has increased.* (Relative advantage 3)
4. Tietoa on aina saatavilla paikasta riippumatta. *Information is available independent from the place.* (Relative advantage 4)
5. Internet-sivujen ansiosta asiakaspalvelumme on nopeampaa. *Customer service is quicker with the help of the internet pages.* (Relative advantage 5)
6. Internet-sivujen välityksellä olemme paremmin asiakkaiden tavoitettavissa. *Customers can reach us better via the internet.* (Relative advantage 6)

Image (3)

1. Internet-sivut ovat parantaneet yrityskuvaamme. *The internet pages have made our company's image much better.* (Image 1)
2. Internet-sivujen avulla yrityksestämme saa hyvän yleiskuvan. *The internet pages offer good general information about our company.* (Image 2)
3. Internet-sivut parantavat yrityksemme imagoa. *The internet pages improve the image of our company.* (Image 3)

Visibility (4)

1. Internet-sivujen avulla yritykset voivat selkeästi parantaa näkyvyyttään. *With the help of the internet pages, companies can improve their visibility.* (Visibility 1)
2. Internet-sivut mahdollistavat yrityksen laajemman näkyvyyden. *The internet pages offer companies a larger visibility.* (Visibility 2)
3. Yleisesti ottaen, internet-sivut lisäävät yrityksien kilpailukykyä. *In general, the internet pages offer companies a way to improve their competitive advantages.* (Visibility 3)
4. Olemme havainneet muidenkin yritysten kannattavan omien kotisivujen hankintaa. *We have noticed that also other companies have set up internet pages.* (Visibility 4)

Result demonstrability (6)

1. Yrityksemme on saavuttanut huomattavan kilpailuedun internet-sivujen ansiosta. *The internet pages have given our company a remarkable competitive advantage.* (Result demonstrability 1)
2. Yrityksemme tunnettuus on parantunut internet-sivujen hankinnan jälkeen. *Our company has become better known since setting up the websites.* (Result demonstrability 2)
3. Internet-sivujen avulla saavutettu hyöty on selkeästi havaittavissa. *The advantages achieved with the websites are clearly perceptible.* (Result demonstrability 3)
4. Olemme kehuneet internet-sivujamme muille yrityksille. *We have told other companies about the benefits of our websites.* (Result demonstrability 4)

5. Yrityksen arvostus muihin yrityksiin nähden on kasvanut internet-sivujen avaamisen myötä. *Our company has become more esteemed since we opened the internet pages.* (Result demonstrability 5)
6. Yrityksemme on saanut uusia asiakaskontakteja internet-sivujen ansiosta. *Our company has achieved new customer contacts with the help of the internet pages.* (Result demonstrability 6)

#### Compatibility (3)

1. Internet-sivumme ovat yhteensopivia kaikkien selainten kanssa. *Our internet pages are compatible with all browsers.* (Compatibility 1)
2. Internet-sivujamme voi käyttää helposti eri laitteilla (PC, matkapuhelin, PDA). *Our internet pages can be browsed easily with different appliances (PC, mobile phone, PDA).* (Compatibility 2)
3. Internet-sivumme sopivat hyvin yrityksessämme vallitseviin asenteisiin. *Our internet pages are very compatible with the general attitudes in our company.* (Compatibility 3)

#### Complexity (2)

1. Internet-sivujen toteutusta pidetään liian vaikeana. *The creation of internet pages is considered very difficult.* (Complexity 1)
2. Internet-sivujen päivitys on koettu hankalaksi. *The updating of internet pages is seen as a very difficult task.* (Complexity 2)

#### Trialability (2)

1. Pystyimme testaamaan internet-sivuja ennen lopullisen ostopäätöksen tekemistä. *We were able to try out the internet pages before the final decision was made.* (Trialability)
2. Testasimme usean eri toimittajan tarjoamia vaihtoehtoja. *We tried out different alternatives offered by different website providers.* (Trialability)

### **Organizational structure**

#### Decentralization (9)

1. Ylin johto antaa ohjeistuksen suunnitelmista poikkeavissa tilanteissa. *The top management gives instructions in unusual situations.* (Decentralization 1)
2. Jos kaikki ei ole mennyt suunnitelmien mukaan, on epävarmaa kuka yrityksessä antaa ohjeita ja neuvoja. *If everything has not gone according to plans, it is not clear who gives instructions and advice.* (Decentralization 2)
3. Työntekijöitä kannustetaan osallistumaan eri päätöksentekotilanteisiin. *The employees are encouraged to participate in different decision-making situations.* (Decentralization 3)
4. Työntekijät tekevät paljon itsenäisiä päätöksiä työssään. *The employees make a lot of independent decisions in their work.* (Decentralization 4)
5. Vain vähän toimenpiteitä voidaan tehdä ilman työnjohdon hyväksyntään. *Only a few actions can be taken without the approval of the middle management.* (Decentralization 5)
6. Henkilöstöä kannustetaan tekemään itsenäisiä päätöksiä työssään. *The employees are encouraged to make independent decisions in their work.* (Decentralization 6)
7. Työntekijöiden täytyy pyytää neuvoja ylemmältä työnjohdolta pienissäkin ongelmatilanteissa. *The employees must ask for advice from the supervisors in smallest matters.* (Decentralization 7)

## APPENDIX 2

8. Työntekijät tarvitsevat toistuvasti ylemmän johdon hyväksyntää työtehtävissään. *The employees need approval of the top management in their work tasks continuously.* (Decentralization 8)
9. Työntekijöiden päätöksillä täytyy olla ylemmän johdon hyväksyntä. *The decisions of the employees must have the top management's approval.* (Decentralization 9)

### Formalization (10)

1. Työntekijöillämme on tarkat, kirjalliset työnkuvaukset. *Our employees have detailed written job descriptions.* (Formalization 1)
2. Yrityksen toimintaperiaatteet ja menettelytavat ilmaistaan kirjallisesti. *The rules and procedures of the company are expressed in written form.* (Formalization 2)
3. Työntekijöiden toimista kerätään jatkuvasti tilastotietoja. *Statistical information is continuously gathered about the employees' work tasks.* (Formalization 3)
4. Yrityksemme on järjestäytynyt tarkan organisaatiokaavion mukaisesti. *Our company follows a very accurate organization chart.* (Formalization 4)
5. Työntekijöille annettavat toiminnalliset ohjeet ovat aina kirjallisia. *Functional advice given to the employees is always in a written form.* (Formalization 5)
6. Työntekijät ovat oman työnsä "pomoja". *The employees are their own bosses in most matters.* (Formalization 6)
7. Työntekijät tekevät omat päätöksensä itsenäisesti. *The employees make their own decisions independently.* (Formalization 7)
8. Työntekijät toimivat itse omien tapojensa mukaan. *The employees work according to their habits.* (Formalization 8)
9. Useimmat työntekijät saavat itse tehdä työohjeet ja säännöt. *Most employees can make their working instructions and rules themselves.* (Formalization 9)
10. Sääntöjen ja ohjeiden noudattamista seurataan erittäin tarkasti. *The following of rules and procedures is observed very accurately.* (Formalization 10)

### Specialization (6)

1. Työntekijöitä siirrellään usein yrityksen eri osastojen välillä. *Employees are often transferred between different departments in the company.* (Specialization 1)
2. Yrityksessämme on tietyt työntekijät joka osastolle. *Each department in our company has its own employees nominated to that department.* (Specialization 2)
3. Työntekijöiden siirtämiseen organisaation sisällä ei ole olemassa yleisiä menettelytapoja. *There are no general procedures for moving employees within the organization.* (Specialization 3)
4. Palkatessamme uusia työntekijöitä valitsemme yksilöitä, jotka vastaavat täydellisesti tiettyjä asettamiamme kriteerejä. *We only hire employees who fit our criteria completely.* (Specialization 4)
5. Palkkaamamme työntekijöiden osaamiseen ei kiinnitetä liian suurta huomiota palkatessa, vaan heidät koulutetaan työhönsä. *The skills of the employees are not paid much attention to at the time of recruiting, since they will be trained for their work.* (Specialization 5)
6. Yrityksessämme ei ole määritelty menettelytapoja uusien työntekijöiden palkkaamiseen. *Our company does not have strict procedures for hiring new employees.* (Specialization 6)

## Organizational openness (8)

1. Yrityksemme osallistuu vain pieniä riskejä sisältäviin projekteihin. *Our company takes part in projects entailing only small risks.* (Organizational openness 1)
2. Yrityksemme suhtautuu avoimesti uusiin tuotteisiin ja palveluihin. *Our company has a positive attitude toward new products and services.* (Organizational openness 2)
3. Yrityksessämme uskotaan uusien tuotteiden ja palveluiden tuovan tehokkuutta yrityksemme toimintaan. *Our company believes that new products and services bring efficiency to our operations.* (Organizational openness 3)
4. Yrityksemme on perinteisesti ollut toimialallaan edelläkävijä uusien tuotteiden ja teknologioiden kokeilemisessa. *Our company has traditionally been a forerunner in trying out new products and technologies.* (Organizational openness 4)
5. Yrityksessämme suhtaudutaan avoimesti ympäristössä tapahtuviin muutoksiin. *Our company has a very open attitude toward changes occurring in the environment.* (Organizational openness 5)
6. Teknologisiin muutoksiin suhtaudutaan ennakkoluulottomasti. *Technological changes are met without prejudice.* (Organizational openness 6)
7. Työntekijämme sopeutuvat nopeasti teknologisiin muutoksiin. *Our employees accommodate themselves very quickly to technological changes.* (Organizational openness 7)
8. Teknologiset muutokset nähdään yrityksessämme haasteellisina. *Our company sees technological changes as very challenging.* (Organizational openness 8)

**Managerial issues**

## Managerial openness toward innovations (5)

1. Yrityksen ylin johto suhtautuu myönteisesti teknologisiin muutoksiin. *The top management has an open attitude toward technological changes.* (Managerial openness toward innovations 1)
2. Yrityksen ylin johto pitää uusien tuotteiden ja palveluiden omaksumista erittäin tärkeänä. *Our top management considers the adoption of new products and services very important.* (Managerial openness toward innovations 2)
3. Yrityksen johtohenkilöt ovat kiinnostuneita uusista teknologioista. *The managers are very interested in new technologies.* (Managerial openness toward innovations 3)
4. Yritysjohdolla on halukas tekemään suuria investointeja uusiin tuotteisiin ja teknologioihin. *The company's management is willing to make large investments into new products and technologies.* (Managerial openness toward innovations 4)
5. Yrityksemme johtohenkilöt etsivät aktiivisesti uusia keinoja tehokkuuden parantamiseen. *The company's management is actively seeking new ways to improve the efficiency.* (Managerial openness toward innovations 5)

## Managerial commitment in innovation adoption (5)

1. Uusien tuotteiden taustalla olevaan tekniikkaan ei tutustuta tarpeeksi. *The management does not get to know the technology behind new products well enough.* (Managerial commitment in innovation adoption 1)

## APPENDIX 2

2. Resurssien puute on hidastanut uusien tuotteiden hankintaa. *Shortage of resources has hindered the acquisition of new products.* (Managerial commitment in innovation adoption 2)
3. Innovaatioiden käyttöönottoaiheeseen pyritään kiinnittämään mahdollisimman vähän resursseja. *Only little, if any, resources are bound to the innovation implementation stage.* (Managerial commitment in innovation adoption 3)
4. Johtotason henkilöt sitoutuvat mahdollisimman vähän innovaatioiden hankintaan. *The managers try to tie themselves as little as possible to the adoption of innovations.* (Managerial commitment in innovation adoption 4)
5. Innovaatioiden käyttöönottoon ei hankita lisäresursseja. *Extra resources are not obtained for innovation implementation.* (Managerial commitment in innovation adoption 5)
6. Käytämme ulkopuolisia asiantuntijoita kontrolloimaan resurssejamme innovaatioita hankittaessa. *We use specialists hired from outside the company to control our resources during innovation adoption.* (Managerial commitment in innovation adoption 6)

### Managerial strategic readiness toward change (5)

1. Yritysjohto on valmis tekemään muutoksia organisaatiossa sopeutuakseen ympäristön muutoksiin. *The company's management is ready to make changes in the organization to accommodate to environmental changes.* (Managerial strategic readiness 1)
2. Yrityksen johtotaso on valmis hyväksymään organisaation rakenteessa tapahtuvia muutoksia. *The management is ready to accept changes in the structure of the organization.* (Managerial strategic readiness 2)
3. Innovaatioiden omaksumisen taustalla ei ole strategista suunnittelua. *There is no strategic planning behind innovation adoption.* (Managerial strategic readiness 3)
4. Uusia tuotteita hankittaessa kiinnitetään huomiota vain tarjoutuneeseen mahdollisuuteen. *When acquiring new products attention is paid only to the offered opportunities.* (Managerial strategic readiness 4)
5. Uusien tuotteiden ostopäätöksen pohjana on houkutteleva tarjous. *A tempting offer is usually behind the buying decision concerning new products.* (Managerial strategic readiness 5)

### *Environmental characteristics*

#### Heterogeneity (7)

1. Yrityksemme täytyy muuttaa jatkuvasti markkinointikeinoja säilyttääkseen markkina- ja kilpailuasemansa. *Our company must continuously change the marketing mix in order to maintain the competitive position.* (Heterogeneity 1)
2. Asiakkaiden tarpeet muuttuvat ajan myötä. *The needs of customers change with time.* (Heterogeneity 2)
3. Uusien asiakkaiden tarpeet poikkeavat usein nykyisten asiakkaiden tarpeista. *The needs of new customers often diverge from the needs of current customers.* (Heterogeneity 3)
4. Asiakkaamme etsivät koko ajan uusia tuotteita / palveluja. *Our customers search continually for new products or services.* (Heterogeneity 4)
5. Olemme havainneet muutoksia siinä, minkälaisia tuotteita / palveluita asiakkaamme haluavat. *We have observed changes in what kinds of products or services our customers need.* (Heterogeneity 5)

6. Yrityksemme on toiminta on erittäin monipuolista ja toiminta keskittyy useille erilaisille markkinoille. *The operations of our company are very diversified and we concentrate on several different markets.* (Heterogeneity 6)
7. Toimialamme yritykset tuovat jatkuvasti uusia tuotteita ja palveluita markkinoille. *The companies in our area of business launch new products and services constantly.* (Heterogeneity 7)

#### Dynamism

1. Tuotantomenetelmät muuttuvat usein toimialallamme. *In our area of business the production procedures change often.* (Dynamism 1)
2. Toimialamme teknologinen kehitys on nopeaa. *Technological development of fast in our area of business.* (Dynamism 2)
3. Teknologinen kehitys tuo mukanaan huomattavia mahdollisuuksia toimialallamme. *Technological development brings along remarkable opportunities in our area of business.* (Dynamism 3)
4. Toimialamme teknologiset läpimurrot ovat mahdollistaneet lukemattomien uusien tuoteideoiden toteuttamisen. *Technological breakthroughs in our area of business have made it possible to realize numerous new product ideas.* (Dynamism 4)
5. Teknologinen kehitys alallamme on melko vähäistä. *Technological development is quite small in our area of business.* (Dynamism 5)
6. Kilpailijoiden toimiin pystytään reagoimaan toimialallamme erittäin nopeasti. *It is possible to react very quickly to competitors' actions in our area of business.* (Dynamism 6)
7. Uusista kilpailijoiden toimista saadaan kuulla lähes päivittäin. *We can hear about competitors' new actions almost daily.* (Dynamism 7)
8. Toimialallamme tuotteet vanhentuvat nopeasti. *Products become obsolete very fast in our area of business.* (Dynamism 8)
9. Toimialallamme on pulaa osaavasta työvoimasta. *In our area of business, there is shortage of educated employees.* (Dynamism 9)

#### Rate of competition

1. Toimialallamme kilpailu on erittäin kireää. *Competition is really tough in our area of business.* (Competition rate 1)
2. Kilpailu tuotteiden ja palveluiden laadulla on yrityksellemme merkittävä haaste. *Competition on the quality of products and services is a great challenge for our company.* (Competition rate 2)
3. Toimialallemme on tyypillistä kova hintakilpailu. *Tough price competition is typical for our area of business.* (Competition rate 3)
4. Samoilla markkinoilla toimivat kilpailijat ovat suhteellisen heikkoja. *The competitors operating in the same markets are relatively weak.* (Competition rate 4)

#### Uncertainty

1. Kilpailijoiden toimia on helppo ennustaa. *The actions of competitors are easy to predict.* (Uncertainty 1)
2. Kysyntätekijät ovat helposti ennustettavissa toimialallamme. *Demand factors are easily predictable in our area of business.* (Uncertainty 2)

## APPENDIX 2

3. Toimintaympäristössämme on suuria uhkia yrityksemme toiminnalle. *Our operating environment holds severe threats to the operations of our company.* (Uncertainty 3)

### **Information behavior**

#### Activeness of the information behavior of the company

1. Yrityksemme kerää jatkuvasti palautetta asiakkailtaan. *Our company gathers feedback from our customers continually.* (Information behavior of the company 1)
2. Yrityksemme seuraa toisissa yrityksissä tapahtuvia teknologisia muutoksia. *Our company keeps abreast with technological changes occurring in other companies.* (Information behavior of the company 2)
3. Kilpailijoiden toimenpiteitä ja menettelytapoja seurataan täsmällisesti. *Our company tracks explicitly the policies and tactics of competitors.* (Information behavior of the company 3)
4. Kilpailijatiedon hankkiminen on systemaattista. *Our company acquires information concerning our competitors systematically.* (Information behavior of the company 4)

#### Activeness of information behavior among the employees

1. Yrityksemme työntekijät vaihtavat keskuudessaan aktiivisesti tietoa ja ideoita. *The employees in our company exchange information and ideas actively with each other.* (Information behavior of employees 1)
2. Yrityksemme kerää oman alansa erikoiskirjallisuutta. *Our company collects literature related to our own area of business.* (Information behavior of employees 2)
3. Kehotamme työntekijöitä lukemaan toimialaa koskevia julkaisuja. *We advice our employees to read publications related to our area of business.* (Information behavior of employees 3)

#### Formality of communication

1. Yrityksessämme tiedon kulku tapahtuu vain virallisia kanavia pitkin. *In our company the information flows only through formal channels.* (Formality of communication 1)
2. Yrityksessämme tietoa kulkee eniten epävirallisia kanavia pitkin. *Most of the information flows through informal channels in our company.* (Formality of communication 2)

**APPENDIX 3:**  
**TESTING THE NORMALITY OF THE VARIABLES**

<i>Variable</i>	<i>N</i>	<i>Kolmogorov-Smirnov Z</i>	<i>Sig. (2-tailed)</i>
<i>Relative advantage</i>	228	1,296	,070
<i>Result demonstrability</i>	227	1,055	,215
Image	228	2,184	,000
Visibility	227	1,776	,004
Compatibility	223	2,259	,000
Complexity	227	2,364	,000
Trialability	221	1,850	,002
Size of the buying center	204	3,203	,000
Amount of personnel	228	3,871	,000
Turnover (€)	222	4,438	,000
<i>Decentralization</i>	231	1,108	,172
Decentralization in decision-making	198	1,609	,011
<i>Degree of functional differentiation</i>	207	1,091	,185
Amount of functional departments	221	4,047	,000
Amount of product and service categories	216	6,516	,000
Specialization,	229	1,866	,002
<i>Formalization</i>	231	,958	,318
Share of highly educated employees	196	3,868	,000
Slack resources: capital	226	3,271	,000
Slack resources: educated employees	229	2,952	,000
Slack resources: materials	229	4,014	,000
Slack resources: talented managers	227	3,167	,000
Organizational openness	229	1,427	,034
The age of the company at the time of adoption	205	1,642	,009
Managerial openness toward innovations	228	1,784	,003
Management commitment in innovation adoption	228	1,732	,005
Managerial strategic readiness	228	2,375	,000
Share of highly educated managers	205	1,534	,018
Management's years of employment in the company	166	2,259	,000
Heterogeneity	229	1,451	,030
<i>Dynamism</i>	229	1,211	,107
Competition rate	229	1,738	,005
Uncertainty	228	2,185	,000
Average amount of competitors for each product category	215	6,285	,000
Amount of partners	201	4,024	,000
Activeness of information behavior among employees	225	1,809	,003
Activeness of information behavior of the company	225	2,009	,001
Formality of information behavior	225	2,380	,000
Amount of website providers the company negotiated with	174	2,717	,000
<i>Amount of information received from different sources</i>	187	1,146	,145

**APPENDIX 4:**  
**CORRELATION MATRIX**

APPENDIX 4

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	1,000																		
2	-0,241	1,000																	
3	-0,156	0,596	1,000																
4	-0,157	0,484	0,625	1,000															
5	-0,168	0,528	0,592	0,572	1,000														
6	0,009	0,110	0,292	0,343	0,277	1,000													
7	0,051	0,023	-0,014	-0,189	-0,071	-0,069	1,000												
8	-0,021	0,154	0,199	0,212	0,154	0,077	-0,192	1,000											
9	-0,077	0,124	0,185	0,100	0,190	-0,069	-0,040	0,076	1,000										
10	-0,103	0,048	0,014	-0,017	0,014	-0,071	0,025	0,051	0,089	1,000									
11	-0,083	0,009	-0,023	0,001	-0,006	-0,076	-0,002	0,068	0,089	0,810	1,000								
12	-0,088	0,115	0,030	0,080	0,073	-0,095	-0,176	0,004	0,158	0,006	0,052	1,000							
13	-0,001	0,123	-0,029	-0,041	0,130	-0,103	0,063	-0,051	0,187	0,268	0,302	0,090	1,000						
14	-0,020	0,195	0,169	0,147	0,178	0,060	0,002	0,097	0,108	-0,080	-0,094	0,337	0,106	1,000					
15	0,026	-0,014	0,010	0,074	-0,046	0,082	-0,075	0,093	-0,200	0,060	0,093	-0,054	-0,103	0,027	1,000				
16	-0,022	0,026	0,006	-0,022	0,024	-0,032	-0,088	0,010	0,077	0,165	0,115	0,008	0,116	0,114	0,024	1,000			
17	0,027	-0,124	0,014	-0,073	-0,079	-0,061	-0,009	0,011	0,082	0,040	0,012	-0,099	0,004	-0,013	0,026	0,479	1,000		
18	-0,013	-0,094	-0,037	-0,061	-0,156	0,057	0,038	-0,084	0,043	-0,025	-0,051	-0,016	-0,030	-0,134	0,011	-0,127	-0,035	1,000	
19	-0,201	0,228	0,112	0,080	0,173	0,018	-0,063	0,134	0,151	0,196	0,221	0,181	0,149	0,128	0,005	0,083	0,026	-0,183	1,000
20	-0,082	0,015	0,089	0,043	0,097	0,051	0,103	-0,013	-0,060	0,030	0,018	0,008	0,093	-0,068	0,060	-0,004	-0,043	-0,017	-0,042
21	-0,087	0,190	0,105	0,060	0,178	-0,055	0,055	-0,024	0,008	-0,007	0,028	-0,004	0,044	0,081	0,094	0,056	-0,005	-0,014	0,047
22	0,030	0,098	0,053	0,211	0,137	0,144	-0,037	-0,004	-0,002	-0,077	-0,187	0,074	0,037	-0,028	0,041	-0,109	-0,096	-0,070	-0,054
23	-0,041	0,140	0,174	0,129	0,208	0,106	-0,132	0,127	-0,047	-0,074	-0,049	0,254	0,018	0,230	0,129	0,012	0,051	-0,094	0,090
24	-0,164	0,151	0,074	0,139	0,165	0,133	-0,114	-0,016	-0,020	-0,035	0,040	0,386	0,048	0,221	0,159	-0,025	-0,074	-0,075	0,141
25	-0,026	0,107	0,003	-0,106	0,016	-0,048	-0,017	-0,023	0,078	0,261	0,196	0,115	0,240	0,021	-0,030	-0,012	0,000	-0,097	0,261
26	-0,105	0,087	0,091	0,208	0,220	0,087	-0,185	0,131	-0,056	-0,100	-0,064	0,373	-0,016	0,311	0,059	-0,094	-0,165	-0,130	0,086
27	-0,171	0,010	-0,053	0,133	0,066	0,093	-0,215	0,128	-0,036	-0,014	0,045	0,314	0,029	0,278	0,023	0,013	0,016	-0,019	0,188
28	-0,073	0,047	0,018	0,098	0,173	0,116	-0,159	-0,004	0,007	0,008	0,037	0,400	0,228	0,312	-0,009	0,013	-0,127	0,003	0,109
29	-0,150	0,207	0,072	0,067	0,116	-0,002	-0,005	0,012	0,206	0,212	0,288	0,112	0,395	0,079	0,004	0,060	-0,011	-0,173	0,540
30	0,085	-0,039	-0,051	-0,076	-0,030	-0,041	-0,022	-0,037	-0,133	-0,023	-0,016	-0,001	-0,076	-0,109	-0,082	-0,059	-0,082	0,112	-0,059
31	-0,190	0,184	0,246	0,109	0,219	-0,009	-0,027	0,016	0,144	0,089	0,026	0,041	0,025	0,166	-0,202	0,019	-0,034	-0,043	-0,040
32	-0,083	0,064	0,136	0,070	0,183	0,036	-0,093	0,034	0,147	0,014	-0,011	0,043	-0,003	0,184	-0,065	0,042	-0,005	0,005	0,118
33	0,070	0,051	0,025	0,114	0,104	0,126	-0,023	-0,133	-0,028	-0,044	-0,050	0,073	-0,044	0,083	0,054	-0,075	-0,101	-0,078	-0,131
34	-0,016	0,069	0,034	0,012	-0,045	0,032	0,079	0,028	-0,012	0,033	0,067	0,074	-0,024	0,022	0,190	0,014	-0,059	-0,063	0,032
35	-0,047	0,094	0,109	0,015	0,120	-0,022	0,055	-0,015	-0,003	-0,037	-0,047	-0,140	-0,074	-0,057	-0,206	-0,051	0,447	0,006	-0,070
36	-0,178	-0,053	0,111	0,017	0,084	0,064	-0,125	0,006	0,059	0,024	-0,001	-0,060	0,003	-0,067	-0,033	0,026	0,032	-0,025	-0,068
37	-0,180	0,218	0,231	0,210	0,233	0,081	-0,066	0,174	0,075	0,081	0,109	0,282	0,108	0,433	0,059	0,108	0,034	-0,185	0,286
38	-0,188	0,110	0,157	0,255	0,251	0,113	-0,089	0,085	0,088	0,005	0,070	0,306	0,145	0,321	0,049	0,041	0,004	-0,071	0,224
39	0,037	-0,035	0,092	0,076	0,013	-0,031	-0,136	0,055	0,015	-0,029	-0,028	0,160	0,086	0,278	0,036	0,018	0,001	-0,148	-0,005
40	-0,038	0,118	0,151	0,021	0,012	-0,147	-0,144	0,280	0,225	0,113	0,069	0,064	0,173	0,042	-0,035	0,067	0,170	-0,087	0,266
41	-0,032	0,155	0,292	0,137	0,266	0,091	0,024	0,068	0,230	0,147	0,102	-0,154	-0,027	0,082	0,061	-0,090	0,072	-0,032	0,109

	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
20	1,000																	
21	-0,003	1,000																
22	0,209	-0,047	1,000															
23	0,184	0,432	0,138	1,000														
24	0,111	0,097	0,221	0,349	1,000													
25	0,029	0,066	-0,022	0,087	-0,023	1,000												
26	0,083	0,049	0,136	0,267	0,533	-0,087	1,000											
27	0,105	-0,007	0,111	0,163	0,240	-0,032	0,328	1,000										
28	0,022	-0,038	0,106	0,219	0,418	-0,027	0,542	0,371	1,000									
29	-0,095	0,103	-0,067	-0,022	0,059	0,276	0,017	0,134	0,153	1,000								
30	-0,020	0,068	-0,126	0,080	-0,064	0,180	-0,037	-0,083	-0,148	-0,191	1,000							
31	-0,022	0,077	-0,127	0,080	0,187	0,018	0,233	-0,076	0,242	-0,059	-0,062	1,000						
32	0,003	0,073	-0,148	0,042	0,313	-0,075	0,268	-0,035	0,215	-0,032	-0,078	0,599	1,000					
33	-0,059	0,089	0,108	0,190	0,266	-0,024	0,281	-0,065	0,232	-0,089	-0,033	0,237	0,184	1,000				
34	0,105	0,046	0,242	-0,013	-0,032	0,075	-0,018	0,066	-0,054	0,072	-0,031	-0,259	-0,353	-0,171	1,000			
35	-0,028	-0,088	0,106	-0,025	-0,089	-0,056	-0,070	-0,114	-0,194	-0,122	-0,084	0,124	0,047	0,091	-0,031	1,000		
36	0,029	0,068	-0,072	0,029	-0,066	-0,087	0,005	0,047	0,017	-0,025	0,010	0,094	-0,022	-0,055	0,023	-0,028	1,000	
37	0,164	0,099	0,087	0,261	0,358	0,039	0,427	0,213	0,380	0,206	-0,133	0,230	0,256	0,114	0,070	-0,097	0,040	1,000
38	0,120	0,104	0,102	0,302	0,449	-0,015	0,491	0,199	0,493	0,130	-0,125	0,172	0,166	0,244	0,100	-0,070	-0,013	0,513
39	-0,098	0,027	-0,073	0,075	0,095	-0,027	0,043	0,065	0,105	0,050	0,003	0,092	0,024	-0,063	-0,043	-0,156	0,031	0,083
40	0,001	0,035	0,042	-0,017	-0,098	-0,005	-0,017	0,082	0,061	0,191	0,022	-0,010	0,018	-0,161	0,023	-0,089	-0,003	0,022
41	-0,007	0,004	0,030	-0,036	-0,023	0,126	-0,044	0,003	-0,111	0,006	0,016	0,155	0,161	-0,029	0,095	0,125	0,050	0,080

	38	39	40	41
38	1,000			
39	0,067	1,000		
40	0,019	0,117	1,000	
41	0,032	0,105	-0,030	1,000

List of Variables

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- 1 The decision year
  - 2 Relative advantage
  - 3 Result demonstrability
  - 4 Image
  - 5 Visibility
  - 6 Compatibility
  - 7 Complexity
  - 8 Trialability
  - 9 Size of the buying center
  - 10 Amount of personnel
  - 11 Turnover (€)
  - 12 Decentralization
  - 13 Decentralization in decision-making
  - 14 Formalization
  - 15 Degree of functional differentiation
  - 16 Amount of functional departments
  - 17 Total amount of product and service categories
  - 18 Specialization
  - 19 Share of highly educated employees
  - 20 Slack resources: capital
  - 21 Slack resources: educated employees
  - 22 Slack resources: materials
  - 23 Slack resources: talented managers
  - 24 Organizational openness
  - 25 The age of the company at the time of adoption
  - 26 Managerial openness toward innovations
  - 27 Management commitment in innovation adoption
  - 28 Managerial strategic readiness
  - 29 Share of highly educated managers
  - 30 Management's years of employment in the company
  - 31 Heterogeneity
  - 32 Dynamism
  - 33 Competition rate
  - 34 Uncertainty
  - 35 Average amount of competitors for each product category
  - 36 Amount of partners
  - 37 Activeness of information behavior among employees
  - 38 Activeness of information behavior of the company
  - 39 Formality of information behavior
  - 40 Amount of website providers the company negotiated with
  - 41 Amount of information received from different sources
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