Aalto University
School of Economics

Adoption of smartphones: iPhone. Research of adopting a mobile phone innovation from private consumers' viewpoint.

Information Systems Science

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Adoption of smartphones: iPhone. Research of adopting a mobile phone innovation from private consumers' viewpoint.

PURPOSE OF THE STUDY

The purpose of the research was to find out what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone. The already existent research did not answer the question of motivators of adopting mobile phone innovations except for at the most on a very general level which makes the topic of the research fresh. In this research is widely used and discussed technology adoption models that are central to research in information systems science and which have been used as a basis for a large amount of scientific research. Also in this research are used models from behavioral science and social science such as the theory of reasoned action, theory of planned behavior and diffusion theory. These sciences in part aim to explain the motivators of human behavior and general adaptation behavior. The research was done from a consumer's viewpoint. Since the consumer market is filling up with new smartphone innovations, the research topic is current and will be interesting at least in the near future as well as no end to the trend of new smartphones can yet be seen. iPhone was selected for the research as it has been the first product to introduce some specific qualities in a smartphone when entering the private consumers' market.

METHODS USED IN RESEARCH

In the research qualitative analysis was used as a research method. Research data was obtained from respondents by individual interviews. Main theories used in the research were Diffusion theory, the Theory of reasoned action (TRA) and the Theory of planned behavior (TPB).

RESULTS

Research results reveal that a too high price can seriously impair the adoption possibilities of an innovation. By using Mill's method of agreement it could be deduced that pricing of technology to be adopted has heavy relational weight as one of the motivators in making the technology adoption decision. As a result of this it could be argued that adoption could be speeded up by offering low-priced tying deals and leasing contracts through businesses for their employees.

Älypuhelinten omaksuminen: iPhone. Tutkimustyö matkapuhelininnovaation omaksumisesta yksityisten kuluttajien näkökulmasta.

TUTKIMUKSEN TARKOITUS

Tutkimuksen tarkoituksena oli selvittää mitkä tekijät vaikuttavat päätökseen omaksua tai hylätä uusi matkapuhelininnovaatio; iPhone. Jo olemassa oleva tutkimus ei vastaa kysymykseen matkapuhelininnovaatioiden omaksumispäätösten vaikuttimista kuin korkeintaan hyvin yleisellä tasolla joten aihepiiri on tuore. Tutkimuksessa käytetään ja käsitellään laajasti tietojärjestelmätieteessä keskeisiä teknologian omaksumismalleja joiden pohjalta on tehty erittäin laajasti tutkimustyötä sekä käyttäytymistieteellisiä ja yhteiskuntatieteellisiä malleja kuten perustellun toiminnan teoria, suunnitellun toiminnan teoria ja diffuusioteoria jotka pyrkivät osaltaan selittämään ihmisen käyttäytymisen vaikuttimia sekä yleistä omaksumiskäyttäytymistä.

Tutkimus tehtiin yksityisten kuluttajien näkökulmasta. Koska yksityisten kuluttajien markkinat täyttyvät uusilla älypuhelininnovaatioilla, tutkimuksen aihe on ajankohtainen ja pysyy kiinnostavana ainakin lähitulevaisuudessa kun toistaiseksi ei ole vielä nähtävissä loppua uusien älypuhelinten trendille. iPhone valittiin tutkimukseen johtuen siitä että se on ensimmäisenä esitellyt joitakin innovatiivisia ominaisuuksia tullessaan markkinoille.

TUTKIMUSMETODIT

Tutkimusmetodina käytettiin kvalitatiivista analyysia. Tutkimustietoa saatiin vastaajilta yksittäisillä haastatteluilla. Teoriat joita pääasiallisesti käytettiin tutkimuksessa olivat Diffuusioteoria, Perustellun toiminnan teoria (TRA) sekä Suunnitellun toiminnan teoria (TPB).

LOPPUTULEMA

Tutkimustulokset paljastavat että liian korkea hinnoittelu voi vakavasti haitata innovaation omaksumismahdollisuuksia. Käyttämällä John Stuart Millin yksimielisyyden metodia (method of agreement) oli pääteltävissä että omaksuttavan teknologian hinnoittelulla on suuri suhteellinen painoarvo yhtenä vaikuttimista kun tehdään päätös teknologian omaksumisesta. Edellä mainitun seurauksena on mahdollista todeta että omaksumista pystyttäisiin vauhdittamaan tarjoamalla matalahintaisia kytkysopimuksia tai yritykset voisivat tarjota liisaus-sopimuksia työntekijöilleen.

AVAINSANOJA

3G, 4G, Diffuusio, Innovatiivisuus, iPhone, Matkapuhelin, Omaksuminen, Rogers, TPB, TRA, Älypuhelin.

Table of Contents

1   INTRODUCTION

1.1   Description of scope of the research and justification

This research concentrates on examining what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone. The aim is to provide useful information to be used in future releases of comparable devices to increase the pace of the diffusion. The research was completed as a qualitative research.

1.2   Research problem and research questions

The research problem was to find what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone.

Research question: what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone.

1.3   Limitations

This research was limited to iPhone mobile phones. The research concentrated in researching private consumers' adoption of mobile phone innovations and organizations' adoption was left out.

1.4 Glossary

3G stands for third generation, referring to the third generation of mobile phone standards and technology. 3G networks are used in delivering digital data and are faster than their predecessors.

4G refers to the fourth generation of cellular wireless standards, with higher speed and security requirements than its predecessors.

App Store is Apple Inc's marketplace for iPhone software, which can be reached by using Apple's iTunes software. iTunes can be installed on both PC and Mac computers free of charge.

Change agent is *"an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (Rogers, 2003, p.27).*

Critical mass (in diffusion of innovations) can be defined as *"the point after which further diffusion becomes self-sustaining" (Rogers, 2003, p.343).*

Diffusion can be defined as a social process of change where subjective information about a new idea is communicated from a person to another person (Rogers, 2003, p.xx/Preface).

Discontinuance is where an individual becomes dissatisfied with an innovation or the innovation becomes replaced with an improved idea.

Innovativeness is *"the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system" (Rogers, 2003, p.22).*

iPad is a line of tablet computers designed and marketed by Apple, Inc.

iPhone is Apple Inc's line of smartphones that function as an e-mail client, Internet browser, media player and most of all are controlled by a multi-touch touchscreen. Three versions of the iPhone have been released, which of the last two support 3G technologies.

iPhone SDK is a kit used to develop software for iOS, Apple's mobile operating system.

Opinion leadership is *"the degree to which an individual is able to influence other individuals' attitudes or overt behavior informally in a desired way with relative frequency" (Rogers, 2003, p.27).*

Smartphone can be categorized as mobile devices providing extended capabilities over a regular mobile phone, such as running standardized user interfaces and platforms. They should not be confused with PDA-based devices and smartphones usually have a phone keypad or touch-screen for input. Smartphones have also bigger displays and more powerful processors.

TAM and TAM 2 are technology acceptance models, which are adaptations of the theory of reasoned action (TRA). TAM 2 is an extension of TAM.

TRA, the theory of reasoned action, is a generic framework to predict and understand an individual's behavior based on the assumptions of human rationality and humans' ability to systematically use the information that they are surrounded with.

TPB, theory of planned behavior, is an extension of TRA which assumes that *"humans take account of information and consider their actions' implications" (Ajzen, 2005, p.117).* The theory also presumes that *"a person's intention to perform a behavior is the most important determinant of that action" (Ajzen, 2005, p.117).*

UTAUT, the unified theory of acceptance and use of technology, was one additional attempt to explain technology acceptance comprehensively. The authors of TAM and TAM 2 theories teamed up with two other researchers; Gordon B. Davis and Michael G. Morris to combine eight different user acceptance models and their extensions under one, unifying theory named UTAUT.

# 2 TECHNOLOGY ADOPTION LIFE CYCLE AND MODELS

2.1 Diffusion of innovations

The research question was to find out what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone. While investigating adoption or rejection principles of innovations it has to be clarified what adoption of innovations really is about and how and on what basis innovations are adopted in general. When discussing the adoption of innovations, perhaps the most well-known book is Diffusion of innovations by Everett M. Rogers (2003).

In his book Diffusion of innovations, Rogers describes diffusion of innovations as basically a social process of change where subjective information about a new idea is communicated from a person to another person (Rogers, 2003, p.xx/Preface). Diffusion in itself is the process in which an innovation is communicated through certain channels over time among the members of a social system. *"It is a special type of communication, in that the messages are concerned with new ideas" (Rogers 2003, p.5).* Communication can be defined as a two-way process of convergence or divergence where participants create and share information with each other, trying to reach a mutual understanding (Rogers, 2003). An example of this would be a person telling another person, for example a friend, that he has discovered a new kind of a great phone, with unseen new qualities. In the research Rogers' theory on Diffusion of innovations (Rogers, 2003) is used to explain innovation adoption process in general and in the case of iPhone. Also the five characteristics of innovation are used to extract central reasons of adopting a new innovation; the iPhone.

In starting to study the diffusion of innovations, Everett M. Rogers' initial main findings were that there was "*an S-shaped adoption curve over time, different sources or channels at different stages of an innovation-decision process for an*

individual and a tendency for innovators (the first individuals in a system to adopt an innovation) to travel and read widely and to have a cosmopolite orientation" (Rogers, 2003, p.xvi/Preface) (see Picture 1: An s-shaped diffusion curve below).

Since diffusion is the kind of communication where the message is about a new idea (such as a touch-screen mobile phone), it means that there is some degree of uncertainty; lack of predictability involved in the diffusion (Rogers, 2003).
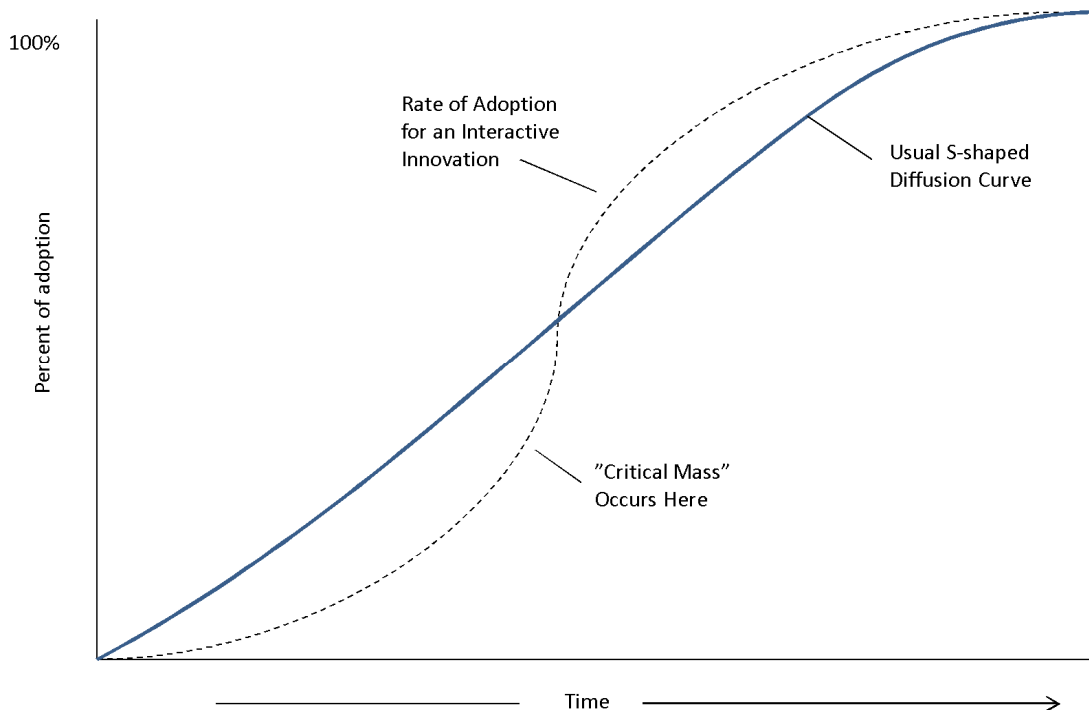
Picture 1: An S-shaped diffusion curve (My Doctorate Journey, 2007).

An innovation is *"an idea, practice or object that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p.12)*. In this research the idea perceived as new is iPhone mobile phone, a smartphone with an advanced user interface (mainly because of its touch-screen qualities).

For something to be an innovation, it doesn't matter whether the idea is objectively new, but how the innovation is perceived. An iPhone may not have any truly new ideas as such, but if the potential adopters perceive it as new, for example because of successful marketing, then it can be counted as an innovation. A technology usually *"has two components: a hardware aspect, consisting of the tool that embodies the technology as a material or physical object, and a software aspect, consisting of the information base for the tool"* *(Rogers, 2003, p.13)*. In this research iPhone functions as the hardware and the applications and the operating system and the applications it uses function as software. Getting knowledge on a new technological innovation creates thoughts of its consequences in minds of potential adopters; such as if the innovation will solve an individual's current problem (Rogers, 2003). For the potential users of iPhone, the problems to solve would be something in the lines of "how to enable quicker access to Internet" or "how to keep track of my profits and losses while on the move".

Information on the innovation reduces uncertainty, thus *"the innovation-decision process is essentially an information-seeking and information-processing activity in which an individual is motivated to reduce uncertainty about the advantages and disadvantages of the innovation"* *(Rogers, 2003, p.14)*. Therefore by giving the adopters a possibility to get access to objective and sufficient information on the innovation (iPhone), the adoption of the innovation should occur more rapidly, taking account the notion that the information should be seen as positive and need-fulfilling on the adopters' part. As the main questions of adopters are usually *"what is the innovation?, how does it work?, why does it work?, what are the innovation's consequences?, and what will its disadvantages and advantages be in my situation?"* *(Rogers, 2003, p.14)*, these questions should be answered in full to ease the adoption.

2.1.1 The five characteristics of innovations

Different innovations have different adoption times; comparing for example a seat belt to a videocassette recorder (VCR). Seat belts took decades to be adopted to all cars whereas VCR was adopted worldwide in just a couple of years (Rogers, 2003). According to Rogers (2003, p.15), *"the characteristics of innovations, as perceived by individuals, help to explain their different rates of adoption"*. Rogers has used the following five attributes or characteristics to explain the differences in the rates of adoption: relative advantage, compatibility, complexity, trialability and observability.

Of the five attributes, relative advantage (1) can be described as how the individuals perceive an innovation in regard to its predecessor; namely meaning that if they view the innovation as having more advantages than the previous innovations, the rate of its adoption will be faster. Relative advantage can be measured for example in terms of economics, social prestige, convenience and satisfaction. In the case of iPhone, the innovation fulfilled many parts of the relative advantage requirements, as for example social prestige was given in the marketing and advertising industries to the owners of iPhone as the iPhone worked as a status symbol in those surroundings.

Compatibility (2) is defined as the extent to what the innovation is consistent *"with the existing values, past experiences and needs of potential adopters" (Rogers, 2003, p.15)*. An idea that is compatible with the values and norms of a social system will be adopted more easily, because adopting a non-compatible innovation requires adopting a new set of social norms, which can take a long time. As for compatibility, iPhone was easy to adopt as an improvement to previous mobile phones, giving for example new enhanced solutions to existing needs.

Complexity (3) *"is the degree to which an innovation is perceived as difficult to understand and use" (Rogers, 2003, p.16)*. If an innovation's idea or concept is

hard to grasp by the adopters, it may slow down the adoption rate considerably. Complexity for Apple iPhone is low as it makes phone usage easier although with its new attributes (mainly touchscreen which was quite new for the whole industry), it may take a short while for a user to adopt the new way of usage.

Trialability (4) *"is the degree to which an innovation may be experimented with on a limited basis" (Rogers, 2003, p.16)*. If an innovation is trialable, such as if an early version of an iPhone with limited functionality could be offered for potential users to experiment with for free, the adoption rate would probably be higher.

In operator shops selling mobile phones the possibility for a trial is available but it is difficult to tell what kind of an effect this opportunity for trial has on users' purchase behavior since the total amount of people who actually try the device in this setting is not necessarily very high.

Observability (5) *"is the degree to which the results of an innovation are visible to others" (Rogers, 2003, p.16)*. Visibility of an innovation stimulates word-of-mouth and helps to increase the adoption rate. In iPhone's case the product has been widely advertised and notified in the press, easing the initial presentation to the public. Word-of-mouth is in itself a very important component, as many people make decisions based on their friends' and associates' recommendations. In the results of the thesis it can be seen that word-of mouth is important to some extent in the diffusion process, but seldom is the sole responsible in the adoption, or may even have very little impact if other affecting variables are strong enough.

The five mentioned attributes are according to Rogers, *"the most important characteristics of innovation in explaining the rate of adoption" (Rogers, 2003, pp.16-17)*. Particularly important attributes of those are relative advantage (1) and compatibility (2).

2.1.2 Communication channels

As communication channels are means by which messages are delivered from one individual to another, they are essential in advancing the adoption of innovations. The type of a relationship between the people who communicate determines the if and how an innovation is transferred and with what effect. Mass media channels such as television or radio are usually the most effective means of informing potential adopters of a new innovation. Then again, interpersonal channels are more effective on persuading individuals to accept new ideas, especially if two people of the same socioeconomic status or other connecting factors are involved in the exchange (Rogers, 2003). Interactive communication in the Internet has recently become important in the diffusion of some innovations as well (Rogers, 2003).

According to Rogers (2003), researches show that most people do not evaluate an innovation on basis of scientific studies or its consequences, but mainly upon subjective evaluation of an innovation coming from similar individuals as themselves who have already adopted the innovation. This suggests that central to the diffusion process is *"modeling and imitation by potential adopters of network partners who have previously adopted" (Rogers, 2003, p.19).* Since one of the biggest problems in diffusion of innovations is that the participants are quite heterophilous (different from each other), this can lead to ineffective communication if for example the communicating individuals are discussing the same things on a different level of understanding.

2.1.3 Time

Including time as one of the variables is important, but time can be difficult to measure in a meaningful way. The time dimension is included in diffusion in three different ways; the time it takes from an individual to adopt or reject an innovation after he has gained knowledge of it, the adopter's adopting point in

relation to other adopting members of the same social system, and the general adoption time of an innovation in a system, measured often by number of adopters per time period (Rogers, 2003).

2.1.4 The innovation-decision process

The innovation-decision process is *"the process through which an individual (or other decision-making unit) passes from first knowledge of innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision." (Rogers, 2003, p.20)*. The author conceptualizes five main steps in that process; knowledge, persuasion, decision, implementation, and confirmation (see Picture 2: The innovation-decision making process below).
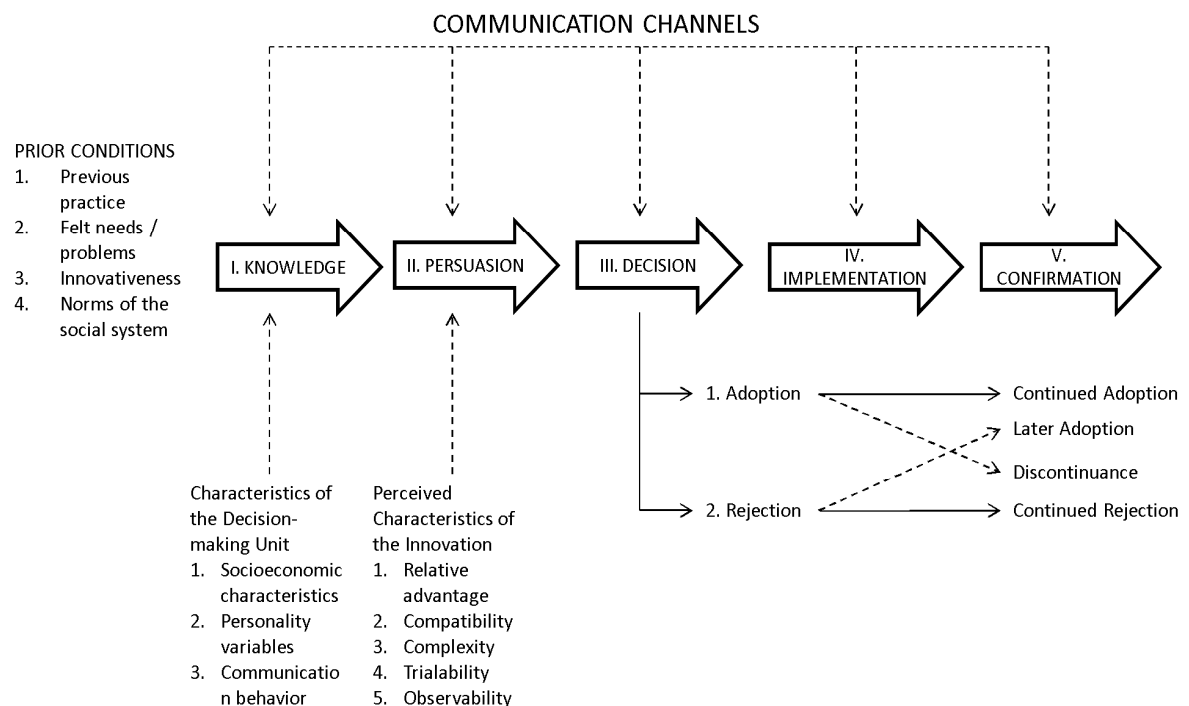
Picture 2: The innovation-decision making process (My Doctorate Journey, 2007).

Knowledge is gained when an individual is informed of an innovation's existence and he understands it on some level. At the knowledge stage, an individual tries to find out about the innovation's cause-effect relationships that are involved in the innovation's capacity to solve a problem (Rogers, 2003).

In iPhone's case, the knowledge to be found would be mainly capacities that typical mobile phones already have and also some new ones as well, such as the already mentioned touchscreen.

Persuasion is the second step of the innovation-decision process. This is where an individual forms an attitude; towards or against an innovation. At this stage an individual wants to know more specifically if the innovation fits his situation (Rogers, 2003), such as for example the need of a user to be able to receive email from multiple sources instead of just one while traveling.

The third step, decision, is made with activities leading to adopt or reject the innovation. Here subjective evaluations of close contacts can have an effect on the individual's decision-making (Rogers, 2003). Hence for example positive word-of-mouth about iPhone or discussion forum visibility of the applications an innovation has can make a difference in choosing what kind of a decision is made.

The implementation phase is entered when an individual uses the innovation. In the implementation phase, many changes can be made by the innovators and adopters. In the diffusion of innovations (2003), Rogers makes three generalizations of re-invention; the degree to which an innovation is changed or modified by a user in process of adoption and implementation:

- *Generalization 5-8: Re-invention occurs at the implementation stage for many innovations and for many adopters.*
- *Generalization 5-9: A higher degree of re-invention leads to a faster adoption rate of an innovation.*

- *Generalization 5-10: A higher degree of re-invention leads to a higher degree of sustainability of an innovation. (Rogers, 2003, p.183)*

The last of the five steps, confirmation, occurs when an individual wants to reinforce an already made innovation-decision, may it be adoption or rejection. This previously made decision may be reversed if the individual is exposed to conflicting messages about the innovation (Rogers, 2003), such as the user learns that child labor is being used to manufacture copies of the otherwise fine innovation.

In general the innovation-decision process is an activity, where an individual seeks information and processes the information about an innovation to decrease uncertainty. The process leads either to adoption or rejection of an innovation. Such decisions can be reversed at a later point for example by the ways of discontinuance where an individual becomes dissatisfied with an innovation or the innovation becomes replaced with an improved idea. It is also possible for an individual to adopt an innovation after a previous decision to reject it (Rogers, 2003).

2.1.5 Innovativeness and adopter categories

Innovativeness is *"the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than the other members of a system"* *(Rogers, 2003, p.22).* As there are five adopter categories according to the author, diffusion research shows that members of each of the adopter categories have many things in common; such as if an individual is like most others in the late majority category, he has relatively low socioeconomic status, doesn't make use of mass media much and learns most about new innovations through interpersonal communication channels.

Adopter categories, the five-part classification of a social system on the basis of innovativeness, are the following, in chronological order: innovators, early adopters, early majority, late majority, and laggards. The classification is based upon the relative time of adopting an innovation (Rogers, 2003).

Even though a five-part classification based on Rogers' theories is possible (see Picture 3: Adopter categories on the basis of innovativeness below), it is impossible to solidly indicate or show that a certain person would belong to a certain single group of the five adopter groups.
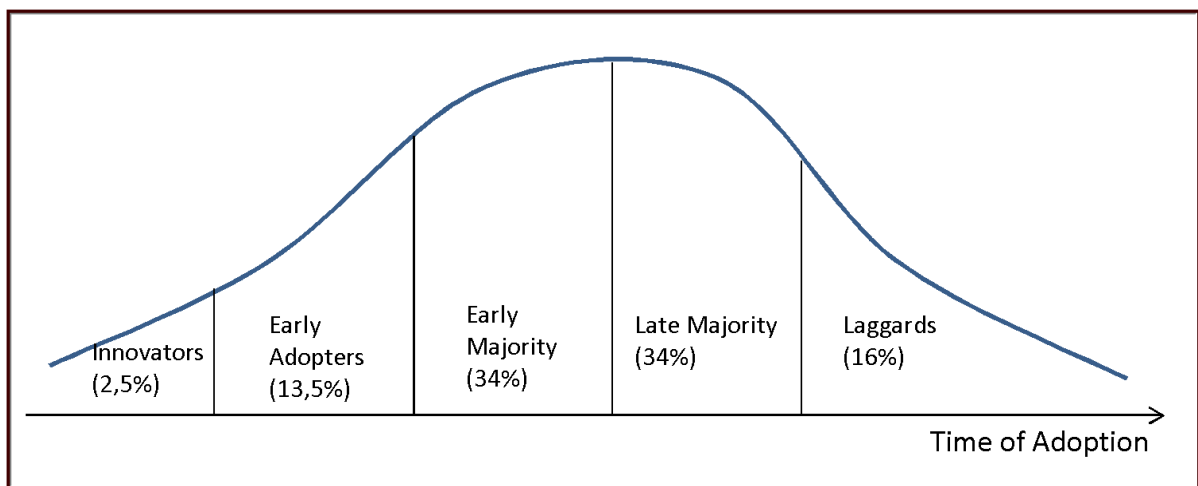
Picture 3: Adopter categories on the basis of innovativeness (Rogers, 2003, p.281), (Fidis.net 2010).

Earlier knowers are still not necessarily earlier in adopting new ideas, as knowing about an innovation is not the same as using it (Rogers, 2003).

From the comparison table by Rogers (2003) (see Table 1: Knowing and adoption of innovations below) it can be seen, that the level of communication has a very central role in diffusion of innovations, as it has a strong effect both in early knowledge of innovations as well as in early adoption of innovations.

Table 1: Knowing and adoption of innovations (Rogers, 2003)

Rogers Generalization Number	Characteristics	Early knowers of innovation: level of characteristics in comparison to late knowers
Earlier knowledge of innovations		
5-1	Education	Higher
5-2	Social status	Higher
5-3	Exposure to mass media channels of communication	Higher
5-4	Exposure to interpersonal channels	Higher
5-5	Contact with change agents	Higher
5-6	Social participation	Higher
5-7	Cosmopolite, level of	Higher

Higher level of communication correlates positively with being an early knower of innovations and an early adopter of innovations (see Table 2: Early adopters of innovation: level of characteristics in comparison to late adopters below).

Table 2: Early adopters of innovation: level of characteristics in comparison to late adopters (Rogers, 2003)

Rogers Generalization Number	Characteristics	Early adopters of innovation: level of characteristics in comparison to late adopters
Socioeconomic characters		
7-2	**Age**	Equal
7-3	**Years of formal education**	Higher
7-4	**Literacy, likeness of**	Higher
7-5	**Social status (also 5-2)**	Higher
7-6	**Degree of upward social mobility**	Higher
7-7	**Unit size of adopter (schools, companies, farms)**	Higher
Personality variables		
7-8	**Empathy**	Higher
7-9	**Less dogmatic**	Higher
7-10	**Ability to deal with abstractions**	Higher
7-11	**Rationality**	Higher
7-12	**Intelligence**	Higher
7-13	**Favorable attitude toward change**	Higher
7-14	**Coping with uncertainty and risk**	Higher
7-15	**Favorable attitude toward science**	Higher
7-16	**Less fatalistic**	Higher
7-17	**Aspirations for formal education, higher status, occupations; amount of**	Higher
Communication behavior		
7-18	**Social participation (also 5-6)**	Higher
7-19	**Level of interconnectivity through interpersonal networks**	Higher
7-20	**Cosmopolite, level of (also 5-7)**	Higher
7-21	**Contact with change agents (also 5-5)**	Higher

7-22	**Exposure to mass media channels of communication (also 5-3)**	Higher
7-23	**Exposure to interpersonal channels (also 5-4)**	Higher
7-24	**Activeness of seeking information about innovations**	Higher
7-25	**Knowledge of innovations, level of**	Higher
7-26	**Degree of opinion leadership**	Higher

2.1.6 Rate of adoption

Rate of adoption is defined as *"the relative speed with which an innovation is adopted by members of a social system" (Rogers, 2003, p.23).* At first only a few individuals adopt an innovation over a fixed period of time such as a month, but soon more and more individuals adopt in each succeeding fixed period of time - increasing the monthly amount of adopters (see Picture 4: An example how different adopter categories are spread in a timeline in an innovation-decision period below). When there are less and less individuals who have not yet adopted the innovation, the "curve" or the amount starts to level off as there are soon no new adopters left. The steepness of the adoption S-curve varies as some innovations are adopted more rapidly in general and some variance is added in relation to different social systems as well (see Picture 5: Variables determining the rate of adoption of innovations on page 26).
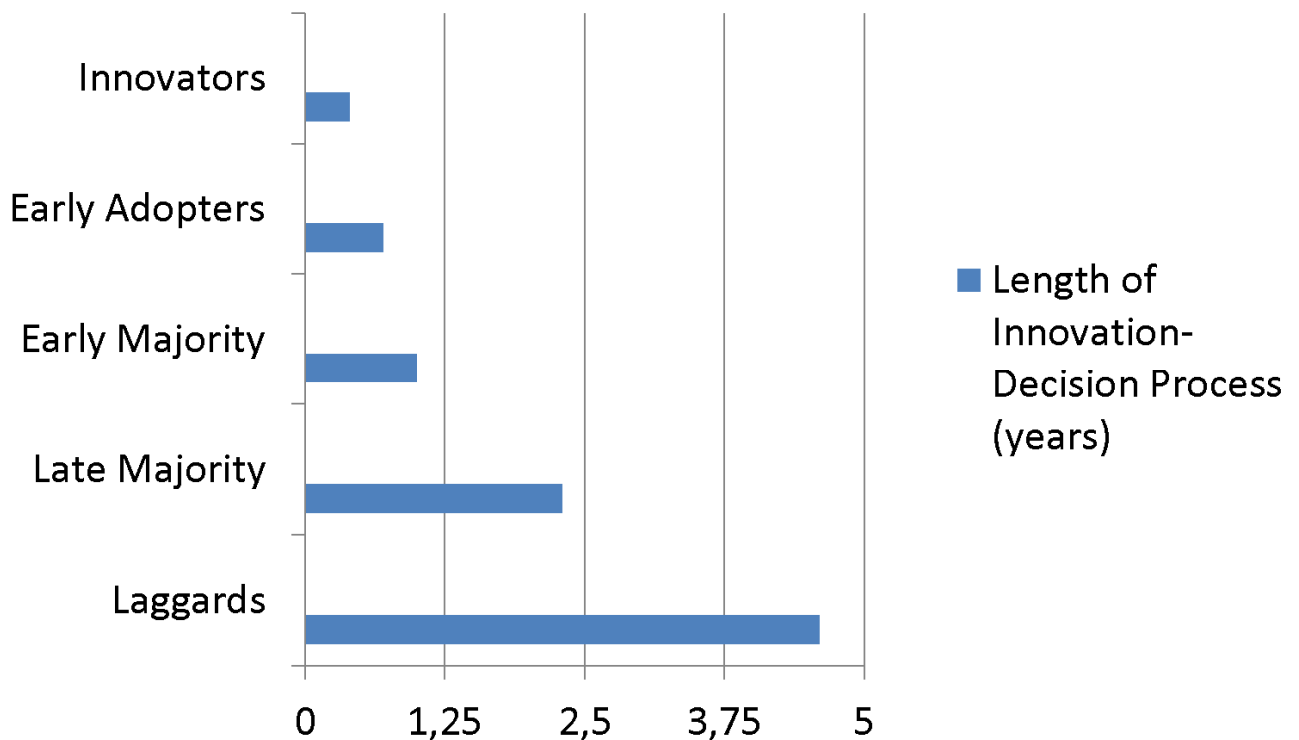
Picture 4: An example how different adopter categories are spread in a timeline in an innovation-decision period (Diffusion of innovations, Rogers, 2003, p.215).

Variables Determining Rate of Adoption	Dependent Variable to Be Explained
Perceived attributes of innovations 1. Relative advantage 2. Compatibility 3. Complexity 4. Trialability 5. Observability Type of Innovation-Decision 1. Optional 2. Collective 3. Authority Communication channels (e.g. mass media or interpersonal) Nature of the Social System (e.g. modern or traditional norms, degree of communication integration, etc.) Extent of Change Agents' Promotion Efforts	RATE OF ADOPTION OF INNOVATIONS

Picture 5: Variables determining the rate of adoption of innovations (Rogers, 2003, p.222), (Instructional Technology Research Online 1996).

2.1.7 Social systems

A social system is defined as *"a set of interrelated units that are engaged in joint problem solving to accomplish a common goal" (Rogers, 2003, p.23)*, meaning that the members or units may be for example individuals, informal groups, organizations and/or subsystems. All members cooperate at least towards reaching a mutual goal. A social system affects how innovations are adopted by for example setting boundaries for the diffusion.

Rogers (2003) states that structure exists in social systems; such as in hierarchical positions where higher-ranked individuals can issue orders to individuals of lower rank, thus creating a formal social structure with these kinds of social relationships (Rogers, 2003). As the structure of a social system *"can facilitate or impede the diffusion of innovations" (Rogers, 2003, p.25)*, social structures play an important role in that process.

As *"norms are the established behavior patterns for the members of a social system" (Rogers, 2003, p.26)*, they can be a barrier to change. The author points out an example of sacred cows in India roaming the countryside when at the same time millions of people are malnourished (Rogers, 2003).

Also social networks tend to form up by certain patterns. According to Rogers (2003, Generalization 8-12), individuals tend to be linked to others who are close to them in physical distance and who are relatively homophilous in social characteristics (Rogers, 2003).

2.1.8 Opinion leaders and change agents

An *"opinion leadership is the degree to which an individual is able to influence other individuals' attitudes or overt behavior informally in a desired way with relative frequency" (Rogers, 2003, p.27)*. The title of an opinion leader is earned and maintained by an individual's social accessibility, technical competence, and conformity to the system's norms. Opinion leaders therefore conform either towards change or oppose it, conforming to the system's norms. Systems can also have both kinds of opinion leaders at the same time. Comparing opinion leaders with their followers, the opinion leaders are more exposed to all forms of external communication, have higher socioeconomic status and are more innovative, but still conforming to system's norms (see Table 3: Characteristics of opinion leaders on page 28). They are also at the center of interpersonal communication networks. Opinion leaders can be worn out by change agents if used too much in diffusion activities (Rogers, 2003).

Many companies marketing their innovations can target opinion leaders as first target group to speed up the innovation process in general.

Table 3: Characteristics of opinion leaders (Rogers, 2003)

Rogers Generalization Number	Characteristics	Opinion leaders: level of characteristics in comparison to followers
Characteristics of opinion leaders		
8-3	**Exposure to mass media channels of communication (also 5-3)**	Higher
8-4	**Cosmopolite, level of (also 5-7)**	Higher
8-5	**Contact with change agents (also 5-5)**	Higher
8-6	**Social participation (also 5-6)**	Higher
8-7	**Socioeconomic status, level of**	Higher
8-8	**Innovativeness**	Higher

"When a social system is oriented to change, the opinion leaders are more innovative; but when the system's norms are opposed to change, the behavior of the leaders also reflects this norm" (Diffusion of innovations, Rogers, p.27).

A change agent is *"an individual who influences clients' innovation-decisions in a direction deemed desirable by a change agency" (Rogers, 2003, p.27)* (see Table 4: Change agents: relation of characteristics or action to success on page 30). Change agents try to obtain the adoption of new ideas but can also try to slow down diffusion. They often use or try to use opinion leaders to help them drive through their goals. Innovations can be adopted or rejected by an individual member of a society ("optional") or by the entire social system as a whole ("collective" or "authority") (Rogers, 2003).

As the trial of a new idea by a peer can substitute at least partly an individual's trial of an innovation, some change agents can speed up the innovation-decision process by sponsoring demonstration of a new idea.

"A demonstration can be quite effective in speeding up the diffusion process, especially if the demonstrator is an opinion leader" (Rogers, 2003, p.177).

The Sequence of Change Agent Roles:

Rogers (2003) has diagnosed seven roles that can be identified for a change agent in process of introducing an innovation:

    (1) To develop a need for change

    (2) To establish an information exchange relationship

    (3) To diagnose problems

    (4) To create an intent to change in the client (motivating clients' interests in an innovation)

    (5) To translate an intent into action

    (6) To stabilize adoption and prevent discontinuance

    (7) To achieve a terminal relationship

(Rogers, 2003)

Table 4: Change agents: relation of characteristics or action to success (Rogers, 2003)

Rogers Generalizati on Number	Characteristics or action	Change agents: relation of characteristic or action to success (Positive or negative)
Change agent success in securing adoption of innovations by clients		
9-1	Change agent effort in contacting clients	Positive
9-2	Client orientation, rather than change agency orientation	Positive
9-3	Diffusion program's compatibility with clients' needs	Positive
9-4	Empathy with clients	Positive

2.1.9 Consequences of innovations

Consequences *"are the changes that occur to an individual or to a social system as a result of the adoption or rejection of an innovation" (Rogers, 2003, p.30-31)*. Author's three classifications of consequences are in pairs;

(8) Desirable - undesirable consequences (functional or dysfunctional effects in a social system)

(9) Direct - indirect consequences

(10) Anticipated - unanticipated consequences (changes recognized/intended by the members of a social system)

(Rogers, 2003)

2.1.10   Knowledge stage of the innovation-decision process

Selective perception means that there is a tendency to interpret communication messages in terms of the individual's existing attitudes and beliefs. People have difficulties in getting favorable ideas about innovations or ideas that they have not previously encountered. Therefore a need for an innovation usually helps to advance awareness-knowledge of it (Rogers, 2003).

According to the author, there are three types of knowledge about an innovation; awareness-knowledge (information that an innovation exists), how-to-knowledge (information on how to use an innovation properly) and principles-knowledge (information dealing with *"the functioning principles underlying how an innovation works" (Rogers, 2003, p.173)*).

2.1.11   Critical Mass in the Diffusion of Interactive Innovations

Critical mass can be defined as *"the point after which further diffusion becomes self-sustaining" (Rogers, 2003, p.343).* The rate of adoption is relatively slow before reaching critical mass (see Picture 6: The Rate of Adoption for an Interactive Innovation, Showing the Critical Mass on page 32), after which the rate of adoption accelerates. In order to reach critical mass sooner and to make it more probable, the author suggests that (1) respected individuals in a system's hierarchy should be targeted for initial adoption of an innovation, (2) individuals' perceptions can be manipulated by telling the innovation is very desirable or inevitable to adopt, or that critical mass will occur soon or has occurred, (3) innovations should be introduced to innovative groups (such as research and development), and that (4) incentives to adopt before reaching critical mass should be provided (Rogers, 2003).
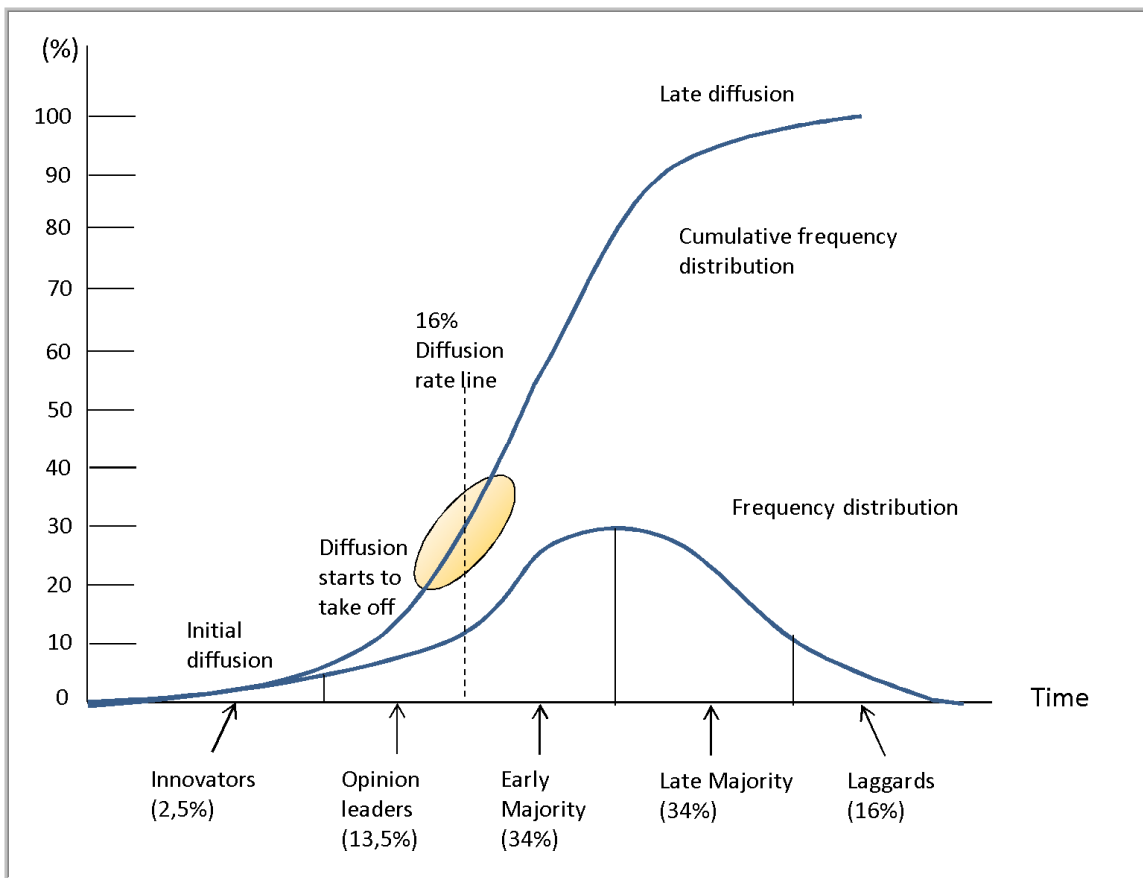
Picture 6: The Rate of Adoption for an Interactive Innovation, Showing the Critical Mass (Mitsue-links 2010).

2.2 Understanding Attitudes and Predicting Social Behavior

To understand reasons for adopting innovations, it is needed to understand some of the basic motivators of human behavior. In the book "Understanding Attitudes and Predicting Social Behavior", the authors Icek Ajzen and Martin Fishbein aimed to prove that a person's behavior can be accounted for by *"reference to a relatively small number of concepts embedded within a single theoretical framework" (Ajzen and Fishbein, 1980, p.4)*. Their theory of reasoned action, TRA, is based on the assumptions of human rationality and humans' ability to systematically use the information that they are surrounded with (Ajzen and Fishbein, 1980). In the research TRA is used to explain how the attitudes of adopters, social pressure and their relative importance affect in the adoption of an innovation; in this case the iPhone.

Authors also concur in that human social behavior is not controlled by overpowering desires or by the subconscious, but people consider the implications of their actions before engaging in a given behavior, and for these reasons they have named their theory "a theory of reasoned action" (Ajzen & Fishbein, 1980).

Ajzen and Fishbein (1980) desire to predict and understand an individual's behavior, which one could say to be a rather challenging task, even if done on a very general level. The task can be started by identifying and measuring the behavior of interest and then finding out what determines the behavior. Intentions predict behavior, but this does not necessarily provide much information about the reasons for the behavior. So the next step is to find the determinants of the intentions.

According to the theory of reasoned action, a person's intention consists mostly of two determinants, which of one is personal and the second one reflects social influence (Ajzen and Fishbein, 1980). The personal one is a person's attitude toward the behavior, i.e. how he evaluates the task at hand; positively or

negatively.

The second one is the person's perception of social pressures towards him to perform or not perform the behavior in question, called subjective norm. *"Usually individuals intend to perform a behavior when evaluated positively and when they believe that important others expect them to perform it" (Ajzen and Fishbein, 1980, p.6).*

In order to tell the acting persons' behaviors in advance, the authors suggest that we still need to have knowledge on the relative importance of "*the attitudinal and normative factors as determinants of intentions" (Ajzen and Fishbein, 1980, p.6).* In the research it was noted from the respondents' answers that even though in general subjective norm can have a big impact in adoption of an innovation, in the case that for example the price of an innovation is very high, such as it is with iPhone, the person's beliefs may be so that the innovation offers very little advantage compared to older versions already in use if the relatively high pricing is taken in consideration.

This leads to the attitude toward behavior having relatively very high importance in comparison to the relative advantage of the subjective norm. Even though those respondents who acquired iPhone had received praise from their friends or relatives, they did not choose to acquire a full priced iPhone because of the high relative importance of the negative attitude toward acquiring of the innovation. All who acquired the iPhone did it by receiving a leasing deal through their employees or purchasing by a tying mobile contract tying the purchaser for up to two years, but with a moderate price.

In addition, the authors point out that with peoples' behavior there is not necessarily a relation between any given external variables such as gender, age, social class and race, as it can be said that an external variable will have an effect on behavior only to the extent that if it influences the determinants of a behavior (Ajzen and Fishbein, 1980).

Authors point out that the way we make our observations does influence the kind of data we will obtain, and that it is important to consider the target at which a behavior is directed.

Also it is important to consider the more general category (beer) versus a specific product in the category (Budweiser) (Ajzen and Fishbein, 1980). Persons may be interested in a product or many products/category. A single context, or many, a point in time or a period of time. As a criticism of the theory it can be said that it does not take in account personality, thus not explaining behavior completely (see Picture 7: TRA - Factors determining a person's behavior below).
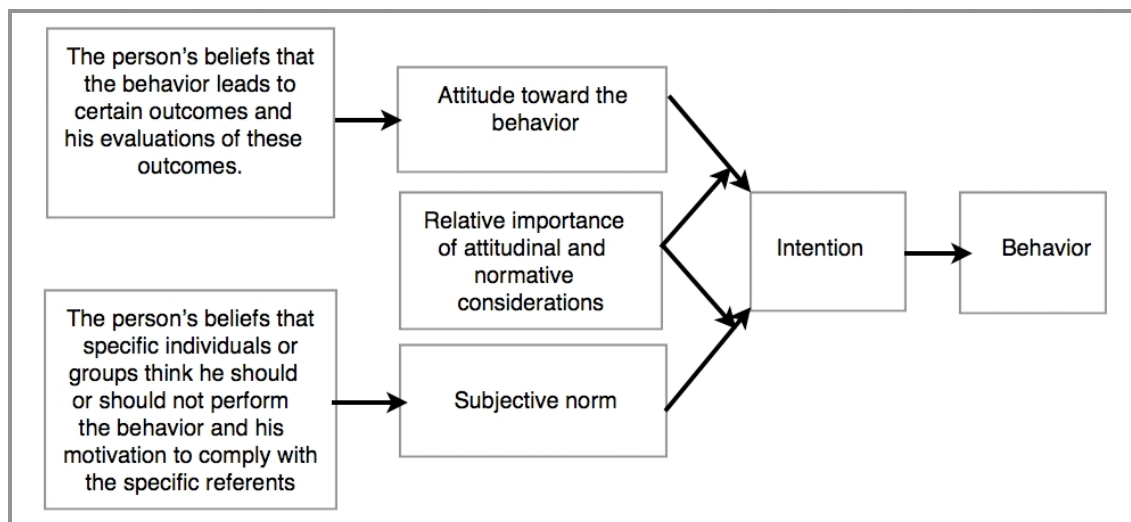
Picture 7: TRA - Factors determining a person's behavior (Ajzen & Fishbein, 1980), (Postfiles7.naver.net).

According to the authors, *"a measure of the likelihood that a person will engage in a given behavior may be termed behavioral intention"* (Ajzen and Fishbein, 1980, p.42) and *"Even relatively short-range predictions could be improved by means of conditional intentions"* (Ajzen and Fishbein, 1980, p.49).

The authors also conclude that *"An attitude toward any concept is simply a person's general feeling of favorableness or unfavorableness for that concept"*

(Ajzen and Fishbein, 1980, p.54). "In our theory, subjective norm refers to the person's perception that important others desire the performance or nonperformance of a specific behavior" (Ajzen and Fishbein, 1980, p.57).

An interesting example of a woman's beliefs using birth control pills is given in the book (see Table 5: Beliefs in using birth control pills below).

Table 5: Beliefs in using birth control pills (Ajzen and Fishbein, 1980, p.66, table 6.2)

MY USING B.C. PILLS	OUTCOME EV	BELIEF STR	PRODUCT
1.causes me to gain weight	-2	+3	-6
2.is convenient	+1	+3	+3
3.enables me to regulate size of the family	+2	+2	+4
4.gives me guilt feelings	-1	+2	-2
5.regulates my menstrual cycle	+3	+1	+3
		TOTAL	+2

Table 5 above shows how a person's behavior can be calculated from the expected value of outcomes multiplied by strength of beliefs and adding together the affecting variables to see the total outcome.

2.3 Attitudes, personality and behavior

Honesty, outgoingness or liking the president are traits and attitudes that cannot be observed and thus can be inferred only from external, observable cues such as a person's behavior (Ajzen, 2005). A personality trait is defined as *"a characteristic of an individual that exerts pervasive influence on a broad range of trait-relevant responses" (Ajzen, 2005, p.2).* Trait-relevant information can come from three sources; an observer, the individual himself, or other people familiar with the individual such as family.

The author thinks that *"the characteristic attribute of attitude is its evaluative (pro-con, pleasant-unpleasant) nature" (Ajzen, 2005, p.3).* As attitudes must be inferred from observable responses, the most popular classification system distinguishes between three categories of responses: cognition, affect and conation, within each of which verbal from nonverbal responses can be separated (Ajzen, 2005).

Theory of planned behavior, TPB (see Picture 8: Theory of planned behavior (TPB) on page 38), assumes that "*humans take account of information and consider their actions' implications" (Ajzen, 2005, p.117).* The theory also presumes that *"a person's intention to perform a behavior is the most important determinant of that action" (Ajzen, 2005, p.117).* Theory of planned behavior is based on the assumption that intentions are a function of three basic determinants; attitude toward the behavior, subjective norm and perceived behavioral control (Ajzen ,2005). In other words, seeing the subject as positive or negative, considering others' norms, the presumptions on himself how he is able to act in regard to subject's requirements, intention functioning as the weighed probability or amount of the previous factors to perform the subject; behavior. TPB is an extension of the theory of reasoned action (TRA).

Perceived behavioral control, the third variable, is defined as the extent to which an individual believes he or she can control his or her behavior; beliefs about factors that will affect difficulty of the behavior, perceived power of these factors and the number of factors.

An example of this kind of control would be thinking "I don't think I am addicted because I can really just not smoke and not crave for it" (I can control behavior), and "It would be really easy for me to quit since I won't get addicted of nicotine (perceived power of nicotine)" (see Picture 9: TPB with beliefs on page 39).
In the research perceived behavioral control is related to the idea on what kind of a control the person thinks he or she has on making the decision of adopting an innovation.
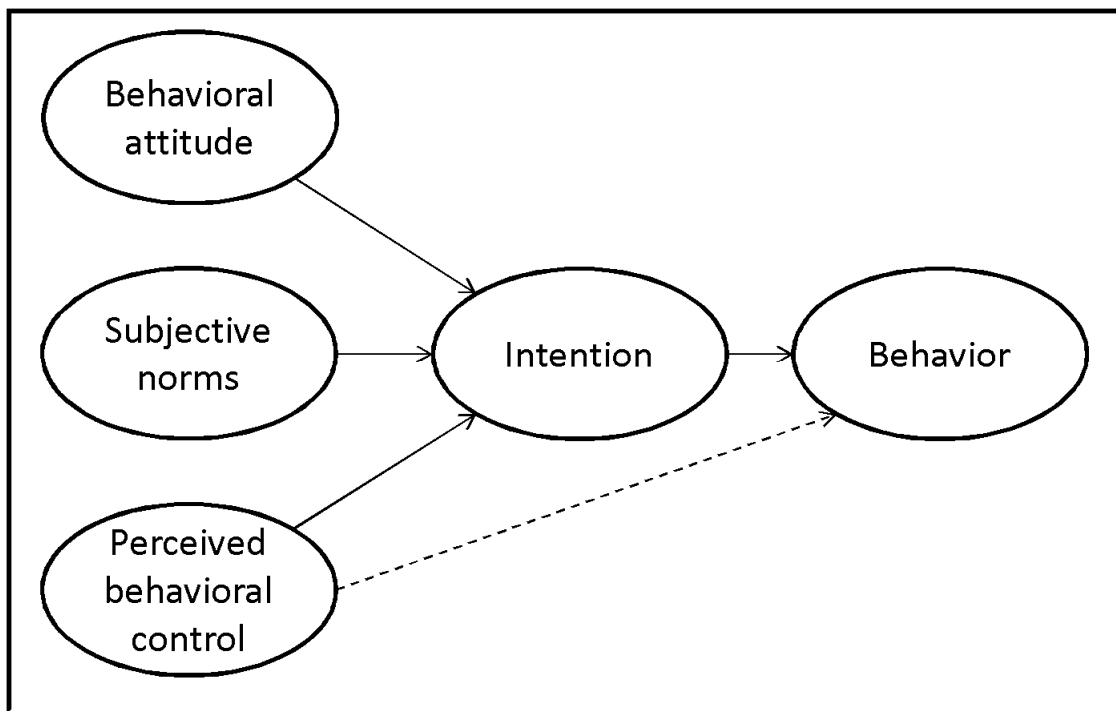
Picture 8: Theory of planned behavior (TPB) (Rickenbach, 2011).
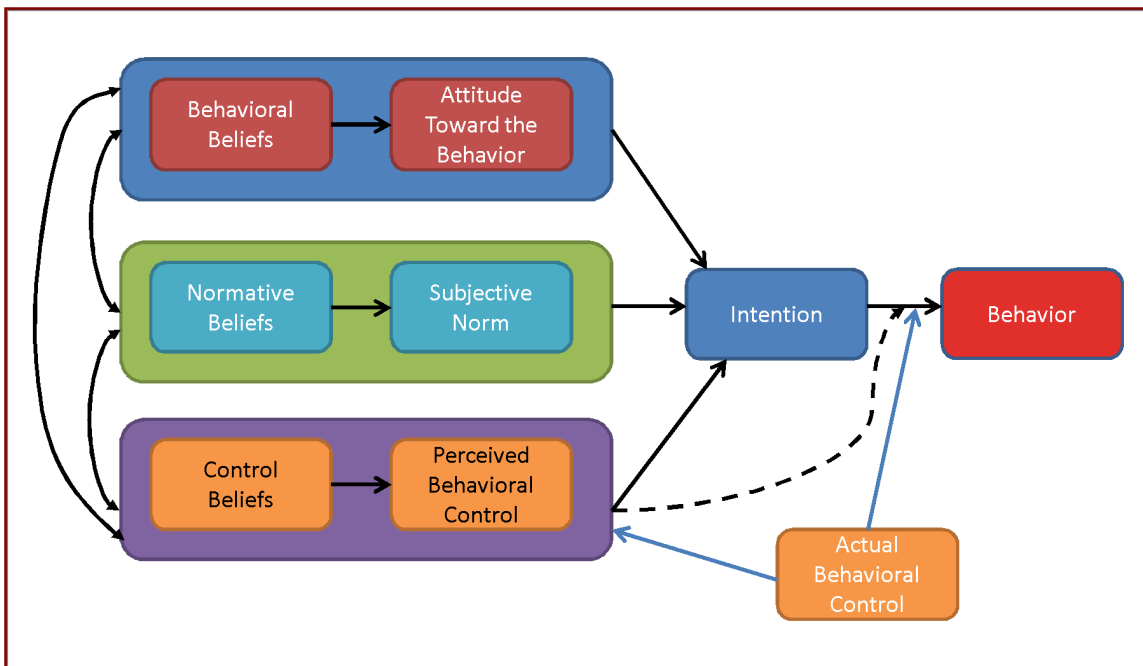
*Picture 9: TPB with beliefs (Ascilite 2011).*

2.4 Technology acceptance model (TAM)

Many theoretical models have been built to explain the user acceptance process of technology. Fred Davis in 1986 took a very general model from social psychology, the theory of reasoned action (TRA) that was designed to explain any human behavior and *"has proven successful in predicting and explaining behavior across a wide variety of domains" (Davis, Bagozzi and Warshaw, 1989, p.1)*, and created TAM, technology acceptance model, as adaptation of TRA. TAM was taken under investigation in the research to find out if it could add explanations or information on adopting of innovations in addition to the already presented theories.

In the article User acceptance of computer technology: a comparison of two theoretical models Davis, Bagozzi and Warshaw discuss how TRA and TAM are able to *"predict and explain user acceptance and rejection of computer-based technology" (Davis, Bagozzi and Warshaw, 1989, p.1).*

The technology acceptance model, TAM, suggest that the mainly relevant behaviors for computer acceptance are perceived usefulness and perceived ease of use (Davis, Bagozzi and Warshaw, 1989). *"Perceived usefulness (U) is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context. Perceived ease of use (EOU) refers to the degree to which the prospective user expects the target system to be free of effort"* *(Davis, Bagozzi and Warshaw, 1989, p.1).*

The technology acceptance model TAM (see Picture 10: Technology acceptance model (TAM), version 1 below) has gained a lot of attention but for some results it doesn't seem to offer a good theoretical explanation. From researching iPhone diffusion it can be noted that even if an innovation can be perceived as useful as in increasing job performance or that it is free of effort, the adoption will not occur if other factors have considerable weight, such as in iPhone's case its high price. A theoretical model explaining the acceptance of technology is not necessarily very viable if it cannot explain technology acceptance in real life. For some parts, TAM model also does not seem to take in consideration what kind of variables could affect individual consumers when making acceptance decisions, but is more directed towards organizations and organizational technology acceptance.
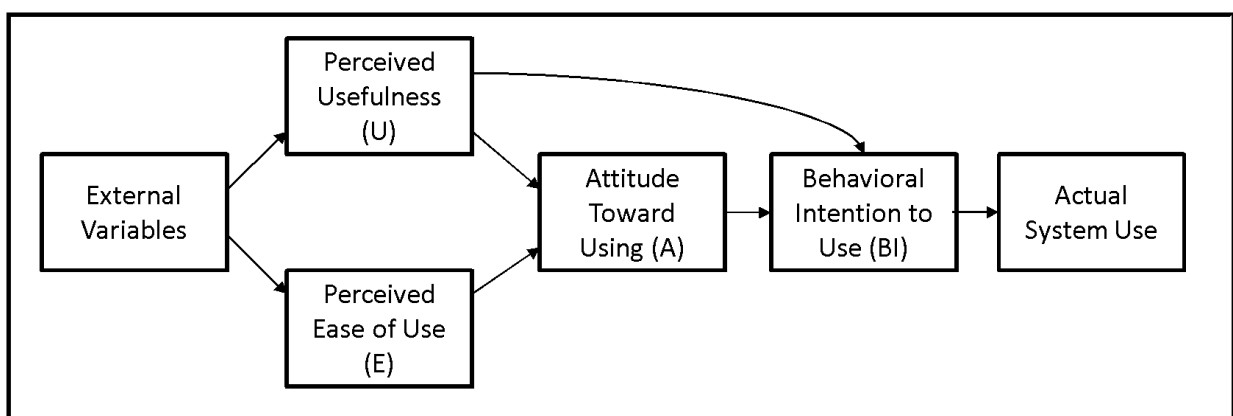
Picture 10: Technology acceptance model (TAM), version 1 (Wikimedia.org, 2010).

In 2000, Fred D. Davis and Viswanath Venkatesh published an article in Management Science (2000, pp.186-204) that developed and tested an extension of the original technology acceptance model. In the research of TAM 2 the authors added more emphasis on the social influence processes than in the original TAM. Still the theory was lacking important criteria that consumers might face in their daily acceptance situations. It does not matter if subjective norm i.e. the social pressure and influence is taken into account within the theoretical model if some other real life variables such as price of technology are so strong that they have very big relative weight in the decision-making process of technology acceptance and adoption. As in the case of iPhone adoption, where the price of the technology item was given such relatively big weight by the respondents that it did not anymore matter whether there was social factors influencing or not.

3   iPHONE

3.1   iPhone: definition of

iPhone is a smartphone that enables the usage of Internet, multimedia and
software applications, and it has many attributes such as a high-definition
camera that enables video recording, Bluetooth, modem capabilities, and many
more features. One of iPhone's most interesting qualities when it entered the
smart phone market was its touch-screen that made it possible to use the
phone without a physical keyboard. When iPhone was initially released touch
screen feature was not yet widely in use by consumers.

Another issue that interested consumers upon release was the possibility to
download various kinds of globally distributed software for a reasonable price or
for free. The user interface of iPhone is a variant of the same system core used
in Mac OS X, which is used in Macintosh computers. Also a tablet computer
called iPad running the same operating system as iPhone was initially released
in April 2010.

There are five generations of iPhone models. One of the models, iPhone 3GS
can be seen in Picture 11: iPhone 3GS on page 43. The latest released version
of the phone; iPhone 4S, was released in October 14th, 2011 (Skoolboyz,
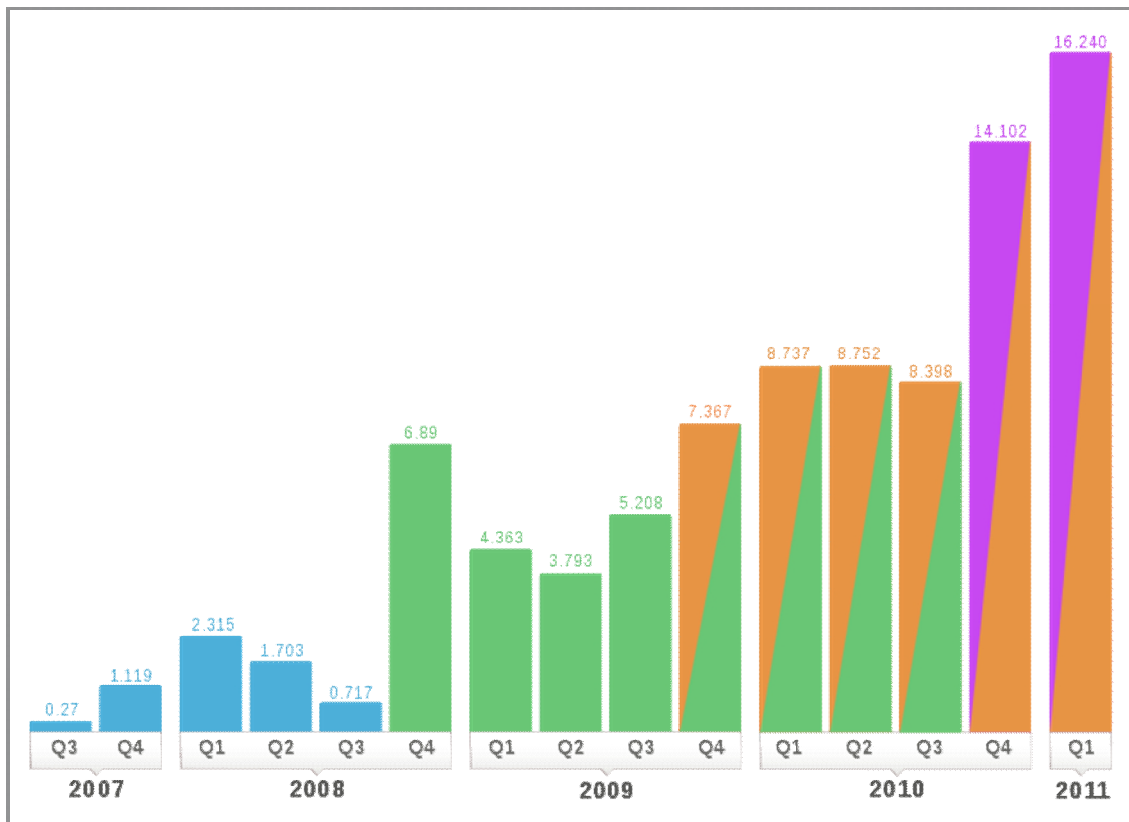2011).

Picture 11: iPhone 3GS (W1 Magazine 2010).

3.2 iPhone sales and adoption rate from September 2007 to June 2011

iPhone was initially released by Apple on June 29, 2007 (Macworld, 2007) and was greeted with much enthusiasm, as it received a good response from the audience and was for example named the Invention of the Year in 2007 by *Time* magazine (Time, 2007). The sales for 2007's quarters three and four were together over one million three hundred thousand pieces and the yearly sales have shown growth every year since (see Table 6: iPhone sales from Q3 2007 to Q3 2011 and Picture 12: iPhone sales per quarter on page 44). Apple had an interesting strategy in iPhone sales to speed up the diffusion. It had made agreements on country level with operators for iPhone to be sold only with tying deals and excluding the operators' competition from selling iPhones.

After a couple of years when the diffusion had progressed from the initial stages, iPhone was released to other operators as well to be sold without tying deals.

Table 6: iPhone sales from Q3 2007 to Q3 2011 (Apple Inc, 2007-2011).

Fiscal Year	[Oct-Dec] Q1	[Jan-Mar] Q2	[Apr-Jun] Q3	[Jul-Sep] Q4	Total sold
2007	-	-	270 000	1 119 000	1 389 000
2008	2 315 000	1 703 000	717 000	6 890 000	11 625 000
2009	4 363 000	3 793 000	5 208 000	7 367 000	20 731 000
2010	8 737 000	8 752 000	8 398 000	14 102 000	39 989 000
2011	16 240 000	18 650 000	20 340 000	NA	55 230 000
Fiscal Year	Q1	Q2	Q3	Q4	128 964 000

Picture 12: *iPhone sales per quarter (Wikipedia, 2011. Based on data from Apple Inc, 2007-2011).*

3.3 Smartphone markets and competition

3.3.1 Smartphone operating systems

There have been namely five bigger smartphone operating systems that have dominated the field, Android, BlackBerry OS, Symbian, iOS and Windows Phone7/Windows Mobile, of which Windows Phone 7/Windows Mobile currently has the biggest predicted compound annual growth rate between 2011-2015 (see Table 7: Worldwide Smartphone Operating System 2011 and 2015 Market Share and CAGR below).

Table 7: Worldwide Smartphone Operating System 2011 and 2015 Market Share and CAGR (IDC, 2011).

Worldwide Smartphone Operating System 2011 and 2015 Market Share and 2011-2015 Compound Annual Growth Rate			
Operating System	**2011 Market Share**	**2015 Market Share**	**2011-2015 Unit CAGR**
Android	38.9%	43.8%	23.7%
BlackBerry OS	14.2%	13.4%	18.3%
Symbian	20.6%	0.1%	-68.8%
iOS	18.2%	16.9%	17.9%
Windows Phone 7/Windows Mobile	3.8%	20.3%	82.3%
Others	4.3%	5.5%	27.6%
Total	100.0%	100.0%	20.1%

3.3.2 Smartphone market shares

Market shares have changed rapidly during the last few years. Especially the exploding growth of Google with its Android mobile phones has been incredible. Apple has sustained its market share and other big players have lost some of theirs, one of the biggest losers being Nokia (see Table 8: Worldwide smart phone market, from fourth quarters in 2009 and 2010, Picture 13: Smartphone market share estimates – 1Q10/1Q11 on page 46 and Picture 14: Mobile OS Traffic Shares in US on page 47).

Table 8: Worldwide smart phone market, from fourth quarters in 2009 and 2010 (Canalys, 2011).

Worldwide smart phone market
Market shares Q4 2010, Q4 2009

OS vendor	Q4 2010 shipments (millions)	% share	Q4 2009 shipments (millions)	% share	Growth Q4'10/Q4'09
Total	101.2	100.0%	53.7	100.0%	88.6%
Google*	33.3	32.9%	4.7	8.7%	615.1%
Nokia	31.0	30.6%	23.9	44.4%	30.0%
Apple	16.2	16.0%	8.7	16.3%	85.9%
RIM	14.6	14.4%	10.7	20.0%	36.0%
Microsoft	3.1	3.1%	3.9	7.2%	-20.3%
Others	3.0	2.9%	1.8	3.4%	64.8%

*Note: The Google numbers in this table relate to Android, as well as the OMS and Tapas platform variants
Source: Canalys estimates, © Canalys 2011
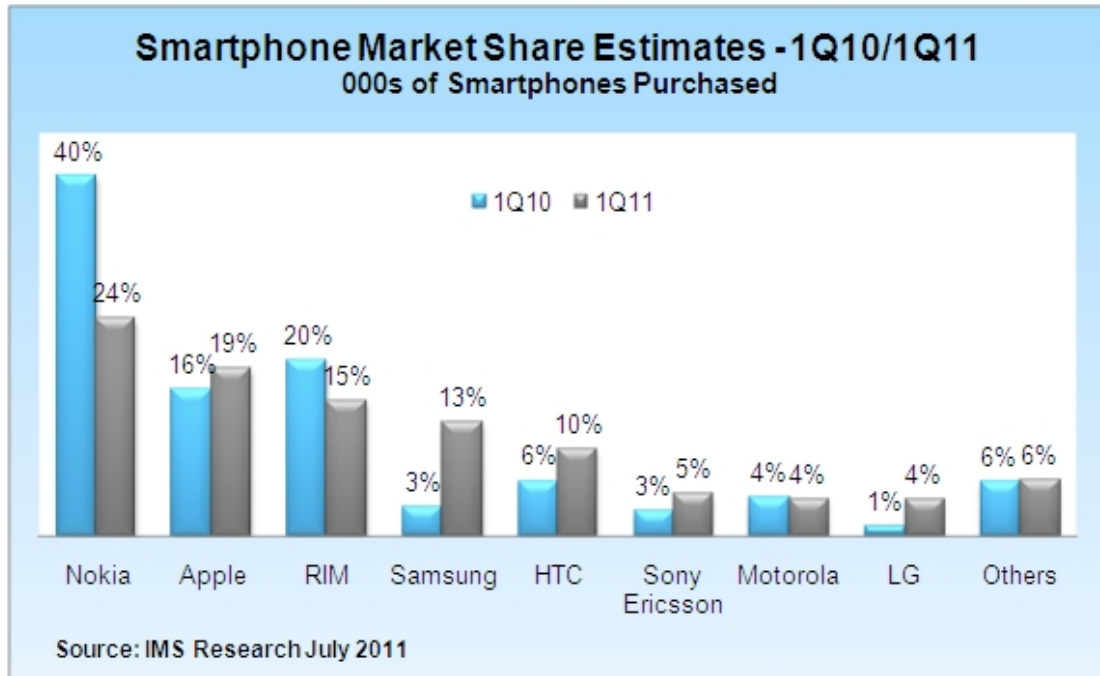
Picture 13: Smartphone market share estimates - 1Q10/1Q11 (IMS Research, 2011).
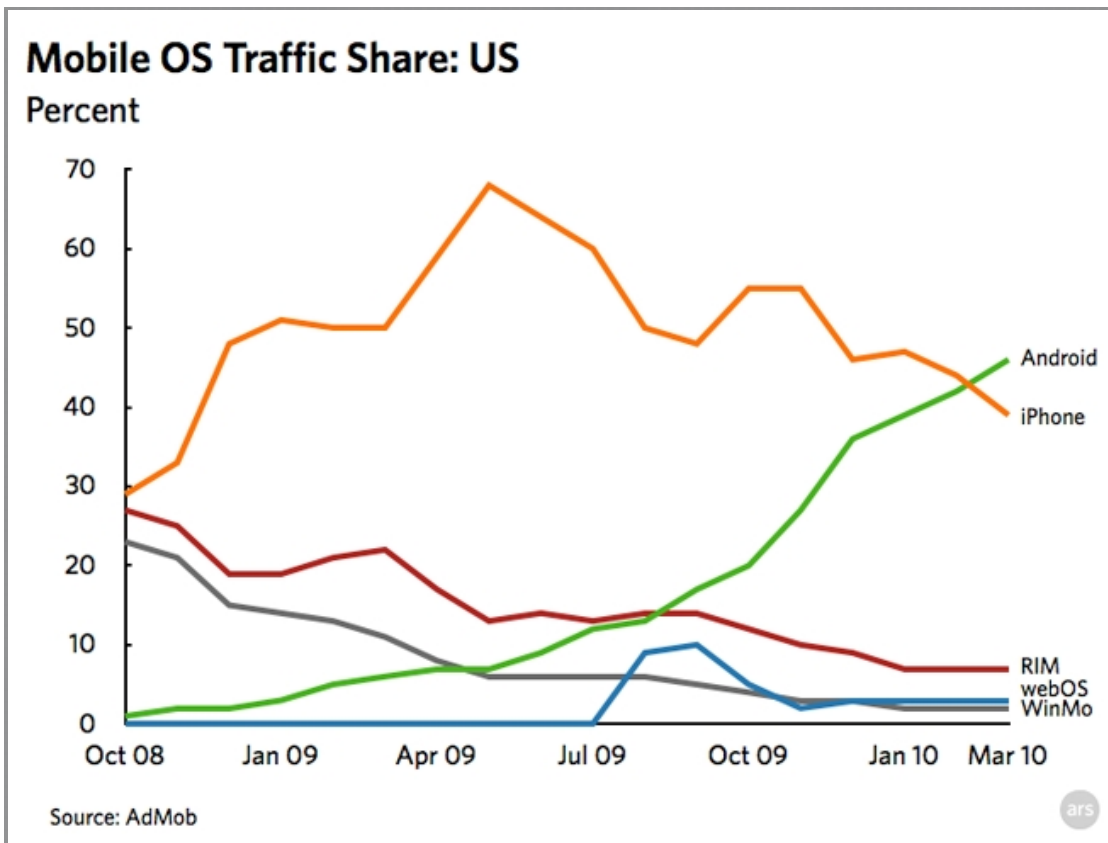
Picture 14: Mobile OS Traffic Shares in US (AdMob 2010).

3.4 iPhone applications

The number of iPhone applications has hugely grown from the initial launch of the phone, with now over 425,000 applications available (Apple Inc, 2011). Applications are available for every possible need, such as applications for cooks, for hiking, for music, gaming, news, and business – everything imaginable. The applications are developed by using the iPhone SDK. Applications can be released in the App Store to be sold at a cost or distributed for free.

3.5   iTunes App Store – a global supply chain

The big amount of iPhone applications is mostly due to the supply chain that is used for selling the applications. The sales are made through iTunes software that is free for consumers and can be installed on PC and Mac computers. iPhone application developers can sell their products worldwide by just merely clicking on the screen to select which countries they want to sell to and by accepting the country-specific end user license agreements. What this means for the developers is that they can instantly get their hands to a global supply chain without the problems of trying to find distributors separately from each individual country. Currently (12.12.2011) there are 123 countries available for distribution in the iTunes App Store.

3.6   iPhone Information security issues
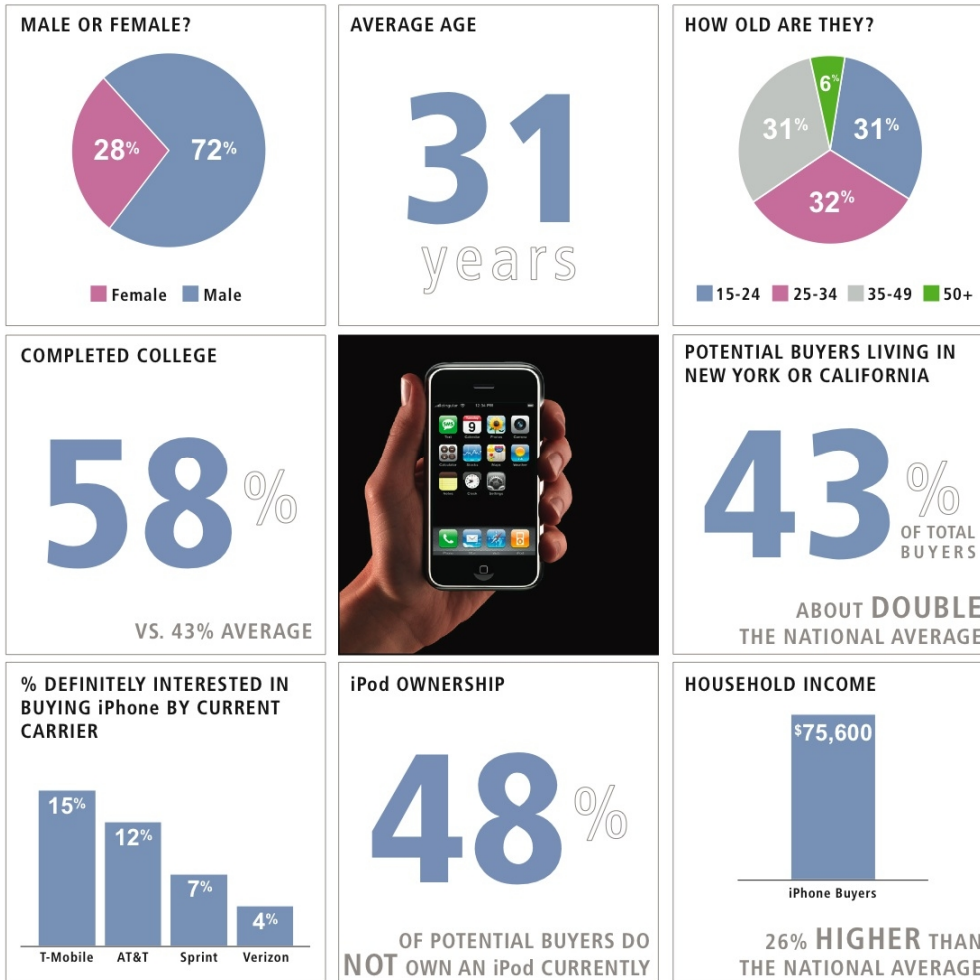
In the last few months (from December 2010 to beginning of February 2011) there has been a lot of debate on the lacking information security that iPhone offers. There are also public websites offering discussion or information on how to exploit the lacking security, such as ISE - independent security evaluators (http://securityevaluators.com/content/case-studies/iphone/).

3.7 Research information on iPhone usage

What kinds of people were initially interested in the iPhone prior to its release? According to an online survey by Solutions research group (http://www.srgnet.com/us/index.html) that comprised 1230 responses, the people were mostly middle-aged, male, educated and earning above the average (see Picture 15: Who will line up for the iPhone? on page 50). Some of the claims that Rogers has set in his book Diffusion of Innovations (2003) are for example that the amount of years of formal education and social status are higher for early adopters in comparison to late adopters of innovations. These claims are concurrent with the online survey by Solutions research group.

Picture 15: Who will line up for the iPhone? (Slash phone 2010).

3.8   Research information on iPhone applications' sales and usage

Downloads of iPhone applications have increased a lot from the initial release of the phone. In March 2011, iPhone applications had been downloaded over ten billion times (MacRumors.com, 2011) (see Picture 16: App Store Downloads below). As 70% of the sales revenues go directly to developers and the remaining 30% goes to Apple Inc, even though part of the applications is free, the App Store in any case creates big revenues for the participants with these numbers. Of course on the developer side the revenues are in respect to number of applications sold, as the sales variance is big between products where some products may sell just a few copies and some a million copies or even more.
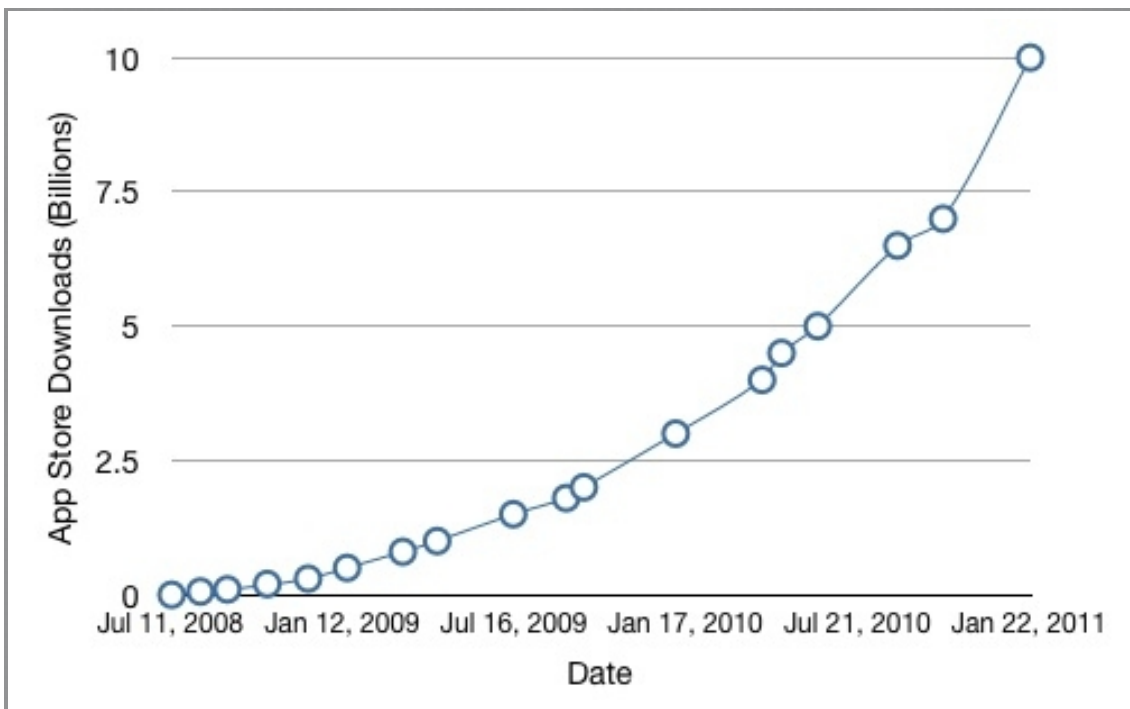
Picture 16: App Store Downloads (MacRumors.com). Retrieved 17.03.2011.

3.9 iPad

Apple iPad (see Picture 17: iPad and iPhone side to side below) is a tablet computer version of iPhone, with no phone capabilities. It was first released in April 2010 and during 2010, Apple sold 14.8 million iPads *(Apple Inc, 2010).*

Picture 17: iPad and iPhone side to side (Muropaketti.com 2010).

4 EMPIRICISM - THE RESEARCH

4.1 Type of research: research methods

The research was completed as qualitative research. In qualitative analysis, source material is often viewed as a whole. Statistical probabilities are not accepted as clues. In qualitative analysis it is attempted to form rules or structure of rules that are valid for the whole source material. Even one exception will cancel the current rule and interpretations of meanings are made based on clues and hints available in the source material (Alasuutari 1995).

Fact view approach (Alasuutari 1995) was used in analysis, meaning that clear distinction was made between the concrete world and the claims made of it. From witness point of view the respondents' answers are examined as witness testimonial of the issue being examined: *"if we are thinking that the respondent is lying, the response has no value, unless we believe to be able to see through the respondent to reality" (Laadullinen tutkimus, 3. uudistettu painos, Alasuutari, Pertti. Vastapaino, 1995, p.96)*. Also *"the reliability of the information must be evaluated on a question by question basis" (Laadullinen tutkimus, 3. uudistettu painos, Alasuutari, Pertti. Vastapaino, 1995, p.103)*.

To derive the truth from respondents, the process of saturation was taken as a basis for collection of information. Pertti Alasuutari in his book Laadullinen tutkimus (1995) quotes Bertaux and Bertaux-Wiame (1981); Bertaux and Kohli (1984) on describing the saturation process: *"..collecting of informational stories can be stopped when new material stops appearing, when new cases already repeat already familiar patterns (Laadullinen tutkimus, 3. uudistettu painos, Alasuutari, Pertti. Vastapaino, 1995, p.107)*. In the research after eleven interviews saturation was achieved.

4.2   Research problem, question and limitations

The research problem was to find what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone.

Research question: what affects the decision when people adopt or reject a new mobile phone innovation; an iPhone.

The research was limited to iPhone mobile phones. The research concentrated in researching private consumers' adoption of mobile phone innovations and organizations' adoption was left out.

4.3   Questionnaire

The questionnaire was created early on and preliminary feedback on questionnaire was received several times before the interviews. The questionnaire was revised and updated based on feedback before the first interview.

4.4   Interviews

Interviews were held from late 2010 to autumn 2011. The interviewees were informed that their answers or the answerers would not be singled out but that the answers would be dealt with as a larger whole. Eleven persons were interviewed. The interviews were recorder and transcribed in detail including pauses and mutterings.

4.5 Interviews and questionnaire: Criticism

There are some aspects that are important to point out at this stage to help in maintaining the objectivity of the research. First of all, it is important to understand that in some way, interviewing current or potential users or adopters of iPhone may have an effect on their purchase behavior or adoption. Second, the interviewer himself owns an iPhone, which may or may not have had an effect in the creation of the questionnaire. Objectivity has been tried to maintain by asking and receiving criticism in regard to the questionnaire and interview methods. There are also some things that can be taken in consideration when evaluating respondents' answers, such as that interviewees may in fact choose or respond how they think that they would act whereas in fact they may in reality act otherwise. Good examples of this are tabloid magazines: no-one will admit to reading those but great numbers of issues are printed and sold anyways.

4.6 Respondents' answers and iPhone adoption

From the results it was not initially easy to find common nominators for iPhone adoption. All of the respondents had received prior knowledge of iPhone through friends, relatives or some other source such as newspaper media or the Internet. Usability was seen with most of the respondents (64%) as the most important attribute from given three attributes price, appearance and usability. Four of the respondents (36% of total) had acquired iPhone, of which three out of four (75%) had acquired the innovation through leasing deal from their employer. Only one respondent had acquired iPhone with completely own funding, and he as well had bought it through tying deal from an operator, resulting in paying in installments and a lower total price.

The respondents were almost equally from both genders, aging from 21-60, income levels varying from low to high. In the tables Table 9: Respondents' answers: Research on iPhone adoption and Table 10: Respondents' answers: Research on iPhone adoption below the respondents' answers can be seen divided into many categories.

Table 9: Respondents' answers: Research on iPhone adoption (1 of 2).

Respondents' answers: Research on iPhone adoption

Number of respondent	Situation 1: A — Has prior knowledge on iPhone	Situation 1: B — Does not have prior knowledge on iPhone	Situation 2: — Prior knowledge on iPhone attributes (Y/N)?	Communication: A — First source of information on iPhone: friends or relatives	Communication: B — First source of information on iPhone: other	Acquiring 1: — Information received from friend had a positive effect on acquiring? (Y/N)	Information: A — Has received or seen information (other than friends, relatives)	Information: B — Has not received or seen information (other than friends, relatives)	Attributes: A — First appreciates Price
1	x		Y	x		Y	x		
2	x		N	x				x	
3	x		Y	x			x		
4	x		N		x		x		
5	x		Y		x		x		
6	x		N		x		x		x
7	x		Y	x			x		
8	x		Y		x		x		
9	x		Y		x	N	x		
10	x		Y	x		N		x	x
11	x		Y	x		N	x		

Table 10: Respondents' answers: Research on iPhone adoption (2 of 2).

Number of respondent	Attributes: B — First appreciates Appearance	Attributes: C — First appreciates Usability	Result: A — iPhone owned by respondent	Result: B — iPhone not owned by respondent (reasons: old works OW, no need NN, too pricey TP)	iPhone Acquired: A — Employer has acquired for employee (respondent)	iPhone Acquired: B — Has acquired by themselves	Gender	Age	Income
1		x	x		x		F	31–35	Med
2		x		x (OW)			F	31–35	Med
3		x		x (NN)			F	56–60	Low
4		x		x (NN)			M	56–60	High
5		x		x (OW)			M	21–25	Low
6				x (TP)			M	21–25	Low
7	x			x (TP)			F	51–55	Med
8	x			x (NN)			M	26–30	Med
9		x	x		x		M	31–35	Med
10		x	x		x		M	31–35	Med
11		x	x			x	M	31–35	Med

In the book *Diffusion of Innovations (Rogers, 2003)* the author describes five characteristics to explain different adoption rates of innovations. They are relative advantage, compatibility, complexity, trialability and observability. From the perspective of relative advantage, respondents did not view iPhone as tremendously more advantageous than its predecessors, so this attribute in itself did not make adoption of iPhone faster. Still, relative advantage also encompasses such categories of measurement such as social prestige with which it might be difficult for the respondents to admit honestly in the interview that they want social prestige even if it would actually be an important issue to them. By using an indicative scale predicting adoption of iPhone regarding the five characteristics of innovations where (-1) would mean that the characteristics is slowing down the adoption, (0) meaning that the effect is neutral and (+1) meaning that the characteristic would speed up the adoption, relative advantage would get a (0).

What comes to iPhone being compatible with the existing values, past experiences and needs of potential adopters, iPhone in general should have been easy to adopt since it was an improvement to previous models of mobile phones, primarily offering some new enhanced solutions to existing needs. Using the indicative scale, compatibility characteristic would get a (+1). The characteristic of complexity would get a (+1) as well, as iPhone is mostly easing mobile phone usage, even though the touchscreen was a new feature on the first iPhones.

The trialability of iPhone was quite good. Half of the people who had acquired iPhone had tried it as well, so (+1) would be appropriate here. The results of the innovation were strongly visible to people, as all the respondents had heard of or knew of iPhone beforehand, giving (+1) for observability. Word-of-mouth had been strong and there had been lot of marketing and news of iPhone prior and after release.

Total sum from the five characteristics using the indicative scale is +4 so in total the characteristics were seen as strongly increasing the pace of adoption of iPhone in comparison to average rate.

According to theory of reasoned action, TRA (Ajzen and Fishbein, 1980), a person's intention consists mostly of two determinants, which of one is personal and the second one reflects social influence (Ajzen and Fishbein, 1980). The personal one is a person's attitude toward the behavior, i.e. how he evaluates the task at hand; positively or negatively and how the person sees that the behavior leads to certain outcomes and how he sees these outcomes. In the case of iPhone respondents thought that adoption was too expensive. Even if the respondents saw that there were good qualities in iPhone, many of the respondents did not see them necessary. This gives a big relative weight to the attribute of attitude where in TRA the attitude toward behavior and subjective norm are the weighed determinants of intentions from which behavior results.

The attitude determinant in TRA is based on the same concept as relative advantage of the diffusion theory depicted in the diffusion of innovations (Rogers, 2003). They both are very close to cost-benefit analysis in their general idea.

The second determinant in TRA that reflects social influence is called subjective norm. Even though social pressure may have been big as all the respondents had previously heard of iPhone before, the relative weight of subjective norm is nonexistent - only one of the respondents had purchased the iPhone with his own money, and none of the respondents had acquired iPhone in other ways than a tying deal from an operator. Therefore it can be deduced that from TRA point of view only the attitude determinant did have an effect on the intention from which behavior results.

The theory of planned behavior, TPB (Ajzen, 2005), adds perceived behavioral control to TRA as a third determinant of intentions, meaning the presumptions on a person for how he is able to act in regard to subject's requirements. The respondents' beliefs on how well they can control acquiring iPhone seem to be strong. It can be deduced from how openly the respondents criticize the price of iPhone. Respondents in general seem to think that marketing or social pressure regarding the iPhone can be resisted or will not have an effect on them. This seems to imply that when a high enough price is at hand, the belief of the ability to control your own behavior is amplified, meaning that people believe in their ability to control at least when exclusionary attributes (in this case, too high price) of an otherwise desirable innovation or item are strong enough. If the price was low enough, people might still have belief in their own ability to control even though it would, in fact, not be as high as in the first case.

Other theories have tried to explain technology acceptance in many ways. Of these theories perhaps the most notable are the technology acceptance model, TAM, and its successor, TAM 2. TAM was created as an adaptation of TRA, the theory of reasoned action. As TAM and TAM 2 proposed that perceived usefulness and perceived ease of use would be the mainly relevant behaviors for computer acceptance (TAM 2 adding social influence as one of the factors), the theories in themselves fail to explain iPhone diffusion. This is because the TAM models do not seem to take in consideration variables that would affect private consumers, but are mainly concentrated towards organizations and organizational technology acceptance.

Even so, as TAM has been created as an adaptation of TRA, and the attitude determinant of TRA closely resembles the relative advantage characteristic of innovations of the diffusion theory (Rogers 2003), the decision making criteria of TAM (perceived usefulness, perceived ease of use) can be taken in consideration when trying to explain iPhone adoption.

When the respondents of the research were asked what of the following three attributes (a) price, b) appearance, c) usability of a mobile phone they most appreciated, c) usability was the most appreciated attribute (64% of respondents). Usability is close to the perceived ease of use decision making criteria in TAM, being defined as *"Perceived ease of use (EOU) refers to the degree to which the prospective user expects the target system to be free of effort" (Davis, Bagozzi and Warshaw, 1989, p.1)*. Therefore the EOU attribute of TAM should be positively oriented towards adoption, giving the diffusion characteristic of relative advantage more weight towards adoption.

As TAM's *"Perceived usefulness (U) is defined as the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context (Davis, Bagozzi and Warshaw, 1989, p.1)"*, it can be said that from the respondents' viewpoint the perceived usefulness criteria was not viewed as important. Respondents did not strive for better job performance within an organizational context.

The respondents who had not acquired iPhone had declared for reason that either their old mobile works well enough, there is no need for a new mobile or that the iPhone was considered too pricy. These are clear reasons but it can also be deduced that if the price was low enough, reasons could be different. As a total conclusion it can be said that iPhone does not do well in most of the respondents' cost-benefit analyses. The relative advantage offered by iPhone compared to their old mobiles is not high enough, mostly due to the high pricing. The benefits are too little in comparison to the price to be able to see iPhone as a favorable option. It seems that for most users, a new high-class brand mobile that has innovative attributes is not valued enough to be a good replacement for concrete value, at least in the case of iPhone.

4.6.1 Demographics

Age

All of the respondents were aged in-between 21-60, distributing quite equally. 31-35 was the most frequent respondent age interval.

Gender

Four of the eleven respondents were female (36%), seven (64%) were male.

Income

There were respondents from all income levels (Low-Medium-High), where low was equal to 30000€ gross income on yearly level, medium from 30001€ to 54000€ and High from 54001€ upwards. Mostly the respondents had Medium income (64%).

4.6.2 Questions of the questionnaire and responses of the respondents

Question 1: Is iPhone somehow familiar to you?

In the first question it was asked whether the respondents already knew iPhone on some level. All of the respondents had some prior knowledge of iPhone.

Question 2: Do you own an iPhone (Yes/No)?

Four of the respondents owned an iPhone, which of three of them had acquired the phone by leasing deal through their employer. The fourth respondent who owned an iPhone had bought it by a tying deal from an operator.

Question 3:

This question was skipped if the respondent owned an iPhone.

(a) You do not own an iPhone, why? Describe the negative purchase decision.

For most, an already working mobile was enough as iPhone was seen as too pricey or as having attributes that were not needed. Also price was seen as too high and that it breaks too easily.

(b): What do you know of iPhone and its qualities/attributes?

Good camera and its attributes such as the possibility to view photographs easily was known by many respondents. Also good looks, easy-to-use interface and the amount of applications were known. Touch screen was also mentioned.

(c): From where did you for the first time get information of iPhone and of its attributes?

First information of iPhone was half from relatives or friends and half from other sources. Some had read about it from newspapers.

(d): Did the information your received have an effect on your purchase decision?

It aroused interest, but did not result in purchasing. One of the respondents had received information on prices which had a negative effect on purchase decision.

(e): Did you have the possibility to try out iPhone before your purchase decision; please elaborate?

All of those who had not acquired had not tried iPhone either.

(f): What was the greatest affecting factor when making the negative purchase decision?

Most reported that they have no need for iPhone because it has attributes that are not needed by the respondents or that it is too expensive.

Question 4:

This question was skipped if the respondent owned an iPhone.

(a) Have you ever used an iPhone or seen an iPhone being used (if, where)?

Many had at least seen iPhone in use, mostly by their friends or relatives.

(b) Have you ever tried / seen iPhone applications being used? If yes, of which application categories? (music, games, finance, photography, others?)

Music and photography were best known.

Question 5:

This question was skipped if the respondent did not own an iPhone.

(a) You already have an iPhone, describe how you acquired it

Three of the four respondents who owned an iPhone had acquired it through their employer, as a leasing contract. Fourth of the four had purchased it through a tying contract from an operator. All of those who had acquired iPhone through their employer could choose whether they wanted to use iPhone as work phone or not.

(b) From where did you for the first time get information of iPhone and of its attributes?

Approximately half of the respondents had received first information from their friends or relatives and half from some other source, such as the Internet or newspaper media.

(c) Did the information your received have an effect on your purchase decision?

Only one of the four respondents who owned an iPhone responded that the information received from a friend had a positive effect on acquiring decision. From this we can deduce that with an enough high pricing social influence does not have much effect on decisions in diffusion.

(d) Did you have the possibility to try out iPhone before your purchase decision; please elaborate?

Half of the people who acquired iPhone had the possibility to try it before purchasing.

(e) What was the greatest affecting factor when making the purchase decision? (Old phone broke down? iPhone tempted with its qualities? Good offer from an operator? Got to try it, liked it?)

Good attributes/qualities were tempting for half, one of the respondents worked in media industry so it was good to have iPhone for work purposes, one respondent acquired just because of low pricing in deal from employer. Negative affecting factors mentioned were tying deals, too high pricing compared to level of device and that competitors had equal or better devices for sale as well.

Question 6:
(a) Did information or experience received from some other sources have an effect on your purchase decision (for example friends, magazine or Internet reviews)?
Marketing of the device was seen as negative by some respondents, as the marketing was seen to try to have elitist flair. One respondent had prior experience from other devices by Apple such as laptop computers, and this had a positive effect on the purchase behavior. One had seen Internet reviews that had a positive effect, and one had seen positive reviews in newspapers that had a neutral effect. One of the respondents responded to have felt social pressure to acquire iPhone but had not done it in any case.
(b) What other information had a positive or negative effect on your purchase decision?
Touch screen was seen as a bit intimidating by one respondent before getting to try it. One of the respondents had started to investigate attributes of the mobile only after he had already decided to acquire it.

Question 7: Did it take long for you take make up your mind on the purchase decision (how long exactly)?
For most of the respondents who had acquired iPhone, it had taken from one to two years to make the decision. Those respondents who had not acquired had made the decision rather quick, but it must be noted that if they change their mind in the future, they will in the light of the research just turn into respondents for whom it has taken from two years up to make up their minds to purchase.

Question 8:

This question was skipped if the respondent did not own an iPhone.

(a) How many different applications you have downloaded or bought in total?

The total number of applications downloaded on average was approximately 40.

(b) How many of those are you using actively (how often is your "actively", exactly)?

On average ten of their applications were used by each respondent regularly.

(c) How are those applications divided between different categories?

Respondents had mainly games and social media applications. Other applications included music and funny/joke categories.

(d) How are those applications divided between costing and non-costing?

Users downloaded mainly free applications.

(e) What is the main reason for you to acquire new applications?

Respondents noted that some of the applications are mobile versions of regular online services - they just might be easier to use on mobile or it's good to have the while traveling. Also curiosity was a reason for some to acquire new applications. One respondent said that he uses applications with qualities that ease his everyday life activities.

Question 9: If you are going to or you are not going to acquire an iPhone in the future, please explain why?

Too high pricing was seen as barrier for many of the respondents. Also lack of interest in technology was seen to have negative correlation with purchasing. One possible reason for acquiring iPhone in the future was to get a different kind of a user experience in relation to current mobile that was quite standard. Also one respondent saw Apple as a negative brand.

Question 10: If you are going to or you are not going change your iPhone to another phone in the near future, please explain why?

Some respondent noted that If the device's operating system will crash a lot, it will be changed to another device quite promptly. It was also hoped that the iPhone would not break soon, because that will probably force to change device as the price is so high. Also some responded that if employer decides that the mobile should be changed to another manufacturer's device, it might be hard to decline. It was also seen that competitors have caught up.

Question 11:

(a) How often do you in general change your mobile (your mobile phone life cycle average)?

The respondents changed mobiles after three to four years on average. No single respondent declared to change mobile before a year had passed from acquiring the device. One of the respondent said he could change if a new, revolutionary mobile would enter the markets.

(b) Why and when does the change happen? (when the old one breaks down, when a new model is released, when a good offer from operator is received)?

If the old one breaks down was probably the most common reason. For those who had lease deal with employer, a common reason was that if their employer gives a new one. One of the respondents answered that when the mobile's attributes get too old in comparison to market standard, they will acquire a new mobile.

Question 12: What attributes or qualities do you feel are most important to you when buying a new mobile phone? Please put the following three attributes in order of preference:

( ) Price
( ) Appearance
( ) Usability

Usability was number one for most of the respondents (64%). Price and Appearance got equal votes, being both number one for 18% of the respondents.

5 CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

5.1 Conclusion and suggestions for possible future research topics

The research was set to find an answer to the research question: "What factors and attributes or types of personalities or characteristics of the five characteristics of innovations affect peoples' choices when making the adoption decision with iPhone?" From the respondents' answers it was deduced that a too high price can seriously prevent the adoption of an innovation. None of the respondents who had acquired iPhone had purchased it with normal pricing, but had leased it through their employer or bought it by a tying contract (although it has to be remembered that tying contracts were mandatory in iPhone sales in Finland until autumn 2010). Almost all of the respondents who had not bought iPhone commented negatively on the high price. By using Mill's method of agreement as depicted in The comparative method by Charles Ragin (1987) "if two or more instances of a phenomenon under investigation have only one of several possible causal circumstances in common, then the circumstance in which all the instances agree is the cause of the phenomenon of interest" (The comparative method, Ragin, Charles. University of California Press Ltd, 1987), we can deduce that all instances agree on pricing of technology to be adopted to have heavy relational weight as one of the motivators in making the technology adoption decision. As a result of this it can be argued that adoption could be speeded up by offering low-priced tying deals and leasing contracts through businesses for their employees.

Based on the results of the research it can be suggested that manufacturers of mobile phones should at least in the initial stages of releasing new models try to negotiate such distribution deals with operators and other distributors that would keep the monthly pricing low for the end-user considering the purchase of a new innovative mobile phone.

This kind of a pricing could be implemented as mentioned before, by offering tying deals to consumers and leasing contracts to companies. Using this kind of a pricing procedure instead of a regular pricing procedure where mobile phones would be sold only with full price would mean that the diffusion of innovation would be quicker in the initial release stage and when a critical mass of consumers would have adopted the innovation, the prices could be set to a higher level, letting go of ties to tying or leasing deals, optimizing the diffusion of a new innovation as well as the profits incurring from the sales of the product. From this viewpoint it is possibly critically important for companies trying to get their recently released mobile phone models noticed to use the knowledge provided by this research to apply the right kind of an approach to pricing.

As this research has found out some guidelines on what basis people adopt an innovation, for possible future research topics it could be suggested for example to do a comparison between different mobile phones to see how the results would differ with various types of models, since this research concentrated solely on iPhone. It would also be very interesting to see if and how current preferences of consumers will change during time. With a large amount of data on the rate of adoption, a comparison of different adoption categories could be made. It might also be interesting to delve deeper into the perceived behavioral control of theory of planned behavior in respect to adoption of iPhone or other mobile phones.

REFERENCES

The Internet

(1) Skoolboyz, 2011. "Apple launched iPhone 4S - so called iPhone 5 - iPhone 4S Price and Releasing Date". Available at: http://www.skoolboyz.in/2011/10/apple-launched-iphone-4s-so-called.html. Retrieved 16.10.2011.

(2) Macworld, Honan, Mathew, 2007. "Apple unveils iPhone". Available at: http://www.macworld.com/article/54769/2007/01/iphone.html. Retrieved 18.02.2010.

(3) Time, Grossman, Lev, 2007. "Invention Of The Year: The iPhone".
Available at:
http://www.time.com/time/specials/2007/article/0,28804,1677329_167854 2,00.html. Retrieved 18.02.2010.

(4) Apple Inc, 2011. "Apple Special Event, June 6, 2011". Available at: http://www.apple.com/apple-events/wwdc-2011/. Retrieved 16.10.2011.

(5) MacRumors.com, Slivka, Eric, 2011. Picture 16: "App Store Hits Ten Billion Downloads". Available at:
http://www.macrumors.com/2011/01/22/app-store-hits-ten-billion-downloads/
Retrieved 17.03.2011.

(6) My Doctorate Journey, 2007. Picture 2: The innovation-decision making process. Available at:
http://docjourney.files.wordpress.com/2007/10/rogers-comm-channels.jpg. Retrieved 11.11.2011.

(7) Instructional Technology Research Online, 1996. Picture 5: Variables determining the rate of adoption of innovations. Available at:
http://www2.gsu.edu/~wwwitr/docs/social/varis.gif. Retrieved 01.04.2010.

(8) Fidis.net, 2010. Picture 3: Adopter categories on the basis of innovativeness. Available at: http://www.fidis.net/typo3temp/tx_rlmpofficelib_ddb3955473.jpg. Retrieved 01.04.2010.

(9) Mitsue-links. Picture 5: The Rate of Adoption for an Interactive Innovation, Showing the Critical Mass. Available at: http://www.mitsue.co.jp/english/case/concept/img/02/fig1.gif. Retrieved 01.04.2010.

(10) Postfiles7.naver.net. Picture 7: Factors determining a person's behavior. Available at: http://postfiles7.naver.net/data20/2006/12/7/182/figure3-keiyko.gif?type=w3 Retrieved 13.04.2010.

(11) W1 Magazine, 2010. Picture 11: iPhone 3G. Available at: http://www.freelondonmagazines.co.uk/communities/9/004/572/339/images/45552333082.png. Retrieved 16.10.2011.

(12) Slash phone, 2010. Picture 15: "Who will line up for the iPhone?" Available at: http://tumblr.iamdanw.com/post/3443285/research-who-will-line-up-for-the-iphone. Retrieved 11.11.2011.

(13) My Doctorate Journey, 2007. Picture 1: An S-shaped diffusion curve. Available at: http://docjourney.files.wordpress.com/2007/10/sshapedcurvebestsm.jpg. Retrieved 17.04.2010.

(14) Admob, 2010. Picture 14: "Mobile OS Traffic". Available at: http://static.arstechnica.com/iphone/admob/admob_smartphone_share_mar10_us.png. Retrieved 28.04.2010.

(15) Table 6: Apple Inc. (25.07.2007). "Apple Reports Third Quarter Results". http://images.apple.com/pr/pdf/q307data_sum.pdf. Press release. Retrieved 21.11.2010.

(16) Table 6: Apple Inc. (22.10.2007). "Apple Reports Fourth Quarter Results". http://www.apple.com/pr/library/2007/10/22results.html. Press

release. Retrieved 21.11.2010.

(17) Table 6: Apple Inc. (22.01.2008). "Apple Reports First Quarter Results". http://www.apple.com/pr/library/2008/01/22results.html. Press release. Retrieved 21.11.2010.

(18) Table 6: Apple Inc. (23.04.2008). "Apple Reports Record Second Quarter Results". http://www.apple.com/pr/library/2008/04/23results.html. Press release. Retrieved 21.11.2010.

(19) Table 6: Apple Inc. (21.07.2008). "Apple Reports Record Third Quarter Results". http://www.apple.com/pr/library/2008/07/21results.html. Press release. Retrieved 21.11.2010.

(20) Table 6: Apple Inc. (21.10.2008). "Apple Reports Record Fourth Quarter Results". http://www.apple.com/pr/library/2008/10/21results.html. Press release. Retrieved 21.11.2010.

(21) Table 6: Apple Inc. (21.01.2009). "Apple Reports First Quarter Results". http://www.apple.com/pr/library/2009/01/21results.html. Press release. Retrieved 21.11.2010.

(22) Table 6: Apple Inc. (22.04.2009). "Apple Reports Second Quarter Results". http://www.apple.com/pr/library/2009/04/22results.html. Press release. Retrieved 21.11.2010.

(23) Table 6: Apple Inc. (22.07.2009). "Apple Reports Third Quarter Results". http://www.apple.com/pr/library/2009/07/21results.html. Press release. Retrieved 21.11.2010.

(24) Table 6: Apple Inc. (19.10.2009). "Apple Reports Fourth Quarter Results". http://www.apple.com/pr/library/2009/10/19results.html. Press release. Retrieved 21.11.2010.

(25) Table 6: Apple Inc. (25.01.2010). "Apple Reports First Quarter Results". http://www.apple.com/pr/library/2010/01/25results.html. Press release. Retrieved 21.11.2010.

(26) Table 6: Apple Inc. (20.04.2010). "Apple Reports Second Quarter

Results". http://www.apple.com/pr/library/2010/04/20results.html. Press release. Retrieved 21.11.2010.

(27) Table 6: Apple Inc. (20.07.2010). "Apple Reports Third Quarter Results". http://www.apple.com/pr/library/2010/07/20results.html. Press release. Retrieved 21.11.2010.

(28) Table 6: Apple Inc. (18.10.2010). "Apple Reports Fourth Quarter Results". http://www.apple.com/pr/library/2010/10/18results.html. Press release. Retrieved 21.11.2010.

(29) Table 6: Apple Inc. (18.01.2011). "Apple Reports First Quarter Results". Available at: http://www.apple.com/pr/library/2011/01/18results.html. Retrieved 16.10.2011.

(30) Table 6: Apple Inc. (20.04.2011). "Apple Reports Second Quarter Results". Available at: http://www.apple.com/pr/library/2011/04/20results.html. Retrieved 16.10.2011.

(31) Table 6: Apple Inc. (19.07.2011). "Apple Reports Third Quarter Results". Available at: http://www.apple.com/pr/library/2011/07/19Apple-Reports-Third-Quarter-Results.html. Retrieved 16.10.2011.

(32) iPhone Sales per quarter. Picture 12: Available at: http://en.wikipedia.org/wiki/File:IPhone_sales_per_quarter_simple.svg. Retrieved 16.10.2011.

(33) Apple Reports Third Quarter Results: http://www.apple.com/pr/library/2010/07/20results.html. Retrieved 17.3.2011.

(34) Apple Reports Fourth Quarter Results: http://www.apple.com/pr/library/2010/10/18results.html. Retrieved 17.3.2011

(35) Apple Reports First Quarter Results: http://www.apple.com/pr/library/2011/01/18results.html. Retrieved

17.3.2011

(36) IDC (09.06.2011). Table 7: "Worldwide Smartphone Market Expected to Grow 55% in 2011 and Approach Shipments of One Billion in 2015, According to IDC". Available at: http://www.idc.com/getdoc.jsp?containerId=prUS22871611. Retrieved 16.10.2011.

(37) Canalys (31.01.2011). Table 8: "Google's Android becomes the world's leading smart phone platform". Available at: http://www.canalys.com/newsroom/google%E2%80%99s-android-becomes-world%E2%80%99s-leading-smart-phone-platform. Retrieved 16.10.2011.

(38) IMS Research (27.07.2011). Picture 13: "Global Smartphones Sales Will Top 420 million Devices in 2011, Taking 28 Percent of all Handsets, According to IMS Research". Available at: http://imsresearch.com/press-release/Global_Smartphones_Sales_Will_Top_420_Million_Devices_in_2011_Taking_28_Percent_of_all_Handsets_According_to_IMS_Research. Retrieved 16.10.2011.

(39) Muropaketti.com, 2010. Picture 17: "Muropaketin ensitunnelmat: Applen iPad". Available at: http://muropaketti.com/muropaketin-ensitunnelmat-applen-ipad. Retrieved 1.12.2011.

(40) Rickenbach, 2011. Picture 8: Theory of planned behavior (TPB). Available at: http://sgspsychology2.webs.com/After%20Guilty/tpb%20ajzen%202.jpg. Retrieved 01.04.2010.

(41) Ascilite, 2011. Picture 9: TPB with beliefs. Available at: http://www.ascilite.org.au/ajet/ajet27/stols1.gif. Retrieved 1.12.2011.

(42) Wikimedia.org, 2010. Picture 10: Technology acceptance model (TAM), version 1. Available at: http://upload.wikimedia.org/wikipedia/commons/thumb/6/67/Technology

_Acceptance_Model.png/800px-Technology_Acceptance_Model.png.
Retrieved 09.10.2011.

Books

(43) Diffusion of Innovations, 5th Edition, Rogers, Everett M. Free Press; Original edition (August 16, 2003).

(44) Understanding Attitudes and Predicting Social Behavior, 1st Edition, Ajzen, Icek & Fishbein, Martin. Prentice-Hall, Inc. (1980).

(45) Attitudes, Personality and Behavior, 2nd Edition, Ajzen, Icek. Open University Press (2005).

(46) Laadullinen tutkimus, 3. uudistettu painos, Alasuutari, Pertti. Vastapaino (1995).

(47) The comparative method, Ragin, Charles. University of California Press Ltd (1987).

Articles

(48) User acceptance of computer technology: a comparison of two theoretical models, Fred D. Davis, Richard P. Bagozzi, Paul Warshaw. Management Science Vol.35, No.8, August 1989, pp.982-1003.

(49) A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, Fred D. Davis, Viswanath Venkatesh. Management Science Vol. 46, No.2, February 2000, pp.186-204.

(50) User acceptance of information technology: Toward a unified view, Fred D. Davis, Gordon B. Davis, Michael G. Morris, Viswanath Venkatesh. MIS Quarterly, Vol. 27, Issue 3, September 2003, pp.425-478.

APPENDIX

Questionnaire: Research on iPhone adoption

Research on iPhone adoption
Helsinki School of Economics / Eero Ekebom
page 1 of 2

Questionnaire

Interviewee's respondent number: **Age (+-5y.):**
Gender: **Income (approx.):**

Question 1: Is iPhone somehow familiar to you?
Question 2: Do you own an iPhone (Yes/No)?
[Question 2: "No" --> Question 3]   [Question 2: "Yes" --> Question 5]

Question 3:   (SKIP THIS IF Question 2: "Yes")
(a): You do not own an iPhone, why? (--> describe negative purchase decision)
(b): What do you know of iPhone and its qualities/attributes?
(c): From where did you for the first time get information of iPhone and of its attributes?
(d): Did the information you received have an effect on your purchase decision?
(e): Did you have the possibility to try out iPhone before your purchase decision; please elaborate?
(f): What was the greatest affecting factor when making the negative purchase decision?

Question 4:   (SKIP THIS IF Question 2: "Yes")
(a) Have you ever used an iPhone or seen an iPhone being used (if, where?)?
(b) Have you ever tried / seen iPhone applications being used? If yes, of which application categories? (music, games, finance, photography, others?)

Question 5:   (SKIP THIS IF Question 2: "No")
(a) You already have an iPhone, describe how you acquired it
(b) From where did you for the first time get information of iPhone and of its attributes?
(c) Did the information you received have an effect on your purchase decision?

(d) Did you have the possibility to try out iPhone before your purchase decision; please elaborate?

(e) What was the greatest affecting factor when making the purchase decision? (old phone broke down? iPhone tempted with its qualities? good offer from operator? got to try it, liked it?)

Question 6:

(a) Did information or experience received from some other sources have an effect on your purchase decision (for example friends, magazine or Internet reviews)?

(b) What other information had a positive or negative effect on your purchase decision?

Questionnaire

Question 7: Did it take long for you take make up your mind on the purchase decision (how long exactly?)?

Question 8: (For iPhone owners)

(a) How many different applications you have downloaded or bought in total?

(b) How many of those are you using actively (how often is your "actively", exactly)?

(c) How are those applications divided between different categories?

(d) How are those applications divided between costing and non-costing?

(e) What is the main reason for you to acquire new applications?

Question 9: If you are going to or you are not going to acquire an iPhone in the future, please explain why?

Question 10: If you are going to or you are not going change your iPhone to another phone in the near future, please explain why?

Question 11:

(a) How often do you in general change your mobile (your mobile phone life cycle average)?

(b) Why and when does the change happen? (when the old one breaks down, when a new model is released, when a good offer from operator is received)?

Question 12: What attributes or qualities do you feel are most important to you when buying a new mobile phone? Please put the following three attributes in order of preference:

( ) Price

( ) Appearance

( ) Usability