**”Al. I. Cuza” University of Iaşi**

**Faculty of Economics and Business Administration**

**Doctoral School of Economics**

**To Mr/Mrs_____**

We hereby inform you that on September, 23, 2013, Mr Silviu Vasilache will defend in public session the PhD thesis entitled „**The factors that influence the behaviour of the consumers of smartphone services in multinational companies”**, as the final stage in the process of obtaining the PhD in Marketing. The presentation will take place at 8am, in room B 417, building B of “Al. I Cuza” University”of Iasi.

The doctoral board is made up of:

**Chair: Professor Constantin SASU, PhD,** Faculty of Economics and Business Administration, “Al. I Cuza” University of Iasi

**Doctoral Supervisor: Professor Emil MAXIM, PhD,** Faculty of Economics and Business Administration, “Al. I Cuza” University of Iasi

**Referents:**

**Professor Răzvan ZAHARIA, PhD,** Academy of Economical Studies, Bucharest

**Associate Professor Călin VEGHEȘ, PhD,** Academy of Economical Studies, Bucharest

**Professor Adriana ZAIȚ, PhD**, Faculty of Economics and Business Administration, “Al. I Cuza” University of Iasi

We hereby send you the synopsis of our PhD thesis and kindly invite you to attend the public session.

The PhD thesis can be consulted in the Library of the Faculty of Economics and Business Administration.

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# INTRODUCTION

Throughout time, people have been preoccupied with communication not only within the groups and communities they belong to, but also in order to transmit to and share with their geographically distant peers, the information and the knowledge they possess, with the intention of helping them. This distant communication – telecommunication – appeared thousands of years before, ranging from the smoke signals used by the Indians, to the lighthouses in ports used by sailors to guide their ships and to the invention of the telephone by Alexander Graham Bell in 1887, which marked the first step towards the use of technology and the beginning of the telecommunication age [78]. Fatouki (2005) duly observed that "the world is rapidly becoming a global village and an important tool in this transformation is communication, and telecommunication represents a key factor. The pace of development in the telecommunication industry is extremely fast all around the world, and it is considered that an innovation replaces a previous one in a couple of weeks" [31].

The retrospective compiled by Omekwu (2006) on the way in which people have accepted the new technologies indicates that the 38-year record held by the radio as the technology used by 50 million people since its invention, was broken by the invention of television, which was embraced in only 13 years by the same number of people, and later on, by the internet, embraced in only 4 years [77].

This research project had as starting point the fact that the telecommunication services are, on one hand, much more complex and more difficult to access than many other services offered to consumers, and on the other hand, the fact that they are necessary in order to fulfil some basic needs of communication. The complexity of these services is an immediate result of the inseparability of the three elements that make telecommunication possible:

- the network infrastructure and the communication technologies frequently used;
- the equipment, the apparatus through which the users are connected;

- the applications the devices are equipped with to ensure connectivity and the interaction between users.

The complexity of telecommunication services, as an added consequence of the complexity of the equipment, technologies, notions and associated language, leads to the idea that accessing and using them is no longer the result of chance, intuition, repeated attempts, flair or luck [42]. Shuhuai and Xingjuin (2009) remarked that the transition from simple information to knowledge is a necessity and aims even further at creating a cooperative environment in which knowledge is shared, and concluded that in communities, innovative fields, the interchangeability of explicit and implicit knowledge ensures a better understanding of activities and phenomena.

Kotler, Kartajaya and Setiawan (2010) argue that the new technology wave allows connectivity and interactivity between individuals and groups as a result of the impact of three major forces: cheap phones and computers, accessible internet services and the availability of the sources, which contribute to the development of individual expression and cooperation between people [52]. Thus, even the mobile phone is confronted with an identity crisis: if in 1990 a mobile phone was a simple device – you dialled a number, it rang and you talked to someone – nowadays it in no longer easy to know if the device is a phone, a radio, a camera, a video camera, an electronic playstation etc, besides being very efficient for a variety of other reasons: energy consumption, size, accessibility, etc.

## The Methodology of the Research

This paper contains a study relating to the behaviour of users of smartphone services conducted in three multinational companies and overviews the specialised literature connected to the socio-psychological behaviour of consumers, as well as the literature connected to accepting and adopting new technologies. We have also elaborated a detailed analysis of the construction and validation of a research model, using the structural equations model in SPSS AMOS 20.

The identification of *the research problem* came from a feedback-need for the researcher, who works in a social or professional environment where some questions needed some answers or specific solutions, whenever people used telecommunication devices, especially smartphones. This feedback became a necessity when someone would get stuck in using one of the functions of the phone that they did not know very well, but which they needed at a certain moment, therefore asking for help. The answer would always come with

additional information and questions: “Why don’t you use the memory card for music?” “Why don’t you store photos in designated folders?” “Why don’t you access the internet for information?”, etc. By investigating this “Why don’t you (…)?”, we realized that once the interlocutors received explanations on how to use and access the device, they showed a greater desire to understand and to experiment with the phone’s existing facilities, thus becoming more receptive in accepting the device in its complexity.

This type of feedback represented the starting point for this research paper, making us study how people are influenced by technology, what they need to understand and do in order to benefit from all the facilities provided by the telecommunication devices which are omnipresent in our daily lives, with focus on the equipment which is present in professional organizations.

## The aim and objectives of the research

Taking into consideration, on the one hand, the omnipresent availability of telecommunication equipment, especially mobile phones, which have become a permanent accessory in our daily lives, combined with the contradiction between the elementary and stringent need of these services and the modest and rather difficult use of the multitude of facilities they offer [9], **the purpose** of this research paper is defined as: the identification of the factors that influence the behaviour of the users of telecommunication services offered by smartphones in order to improve their usage and the construction of a model applicable to this behaviour.

The companies that provide this type of services permanently analyze and study the needs of the consumers as well as the evolution of the telecommunication market in order to meet these needs. The consumers’ needs are influenced by both the facilities offered at a certain moment by the telecommunication equipment and the internal and external interaction which occurs as a result of the free circulation which enables them to see and borrow new habits and behaviours. The evolution of the telecommunication market is mainly determined by the technological progress which ensures the emergence of new technologies which facilitate access wherever and whenever and allow the rapid transfer of information.

This paper defines two categories of fundamental objectives, namely:

a) the first objective is linked to identifying and determining the influence of the technological, social, organizational and relational factors (the relations

between providers and users) on the effective behaviour of the smartphone users;

b) the second objective is linked to constructing and validating the model corresponding to the behaviour of the smartphone services users.

## The Context of the Research

The present research was carried out in the field of telecommunications, a developing field in which mobile telecommunication services play an important role. Within these services, the smartphone services represent the newest and the most appealing part for the researcher due to the diversity of facilities and opportunities they offer, which require a good understanding and promotion towards potential users.

The smartphone concept appeared in 2000, and since then sales have increased significantly from one year to the next [103], and its definition varied in scientific communities in accordance with the scientific progress in the field.

Starting from the very fast technological progress, the new facilities and the characteristics which appear at an alert pace, while the previous ones become obsolete and thus useless, and from the personal professional experience in the field, ***the smartphone*** could be defined more analytically as **a mobile phone equipped with an operating system like: Android (Google), IOS (Apple), Windows Phone (Microsoft), Blackberry OS (RIM) etc., on which various applications can be run and whose characteristics and facilities are similar to those of a computer: internet access, GPS, office packet, email, messenger, multimedia, agenda, etc. This definition will be used throughout this research. *The smartphone services* can be defined as the telecommunication activities and services which can be performed in real time as a result of combining the characteristics and the facilities of the smartphone with the ability of the provider to valorize them at any time and everywhere.**

For the consumers in our country, the smartphone also represents a tempting and appealing product due to the multitude of facilities it offers, the access technologies and the shape and design of the devices and the accessories.

## The hypotheses of the research

The hypotheses of the research were derived from the specialised literature and the professional experience in a double approach, theoretical and deductive. This approach was

adopted with the intention of identifying the factors that would influence the behaviour of the consumers of smartphone services.

To sum up, a consolidation of the hypotheses with their sources is found in Table 1.1.

**Table 1.1 Construction of hypotheses**

| Means | Sourse | Hypotheses |
|---|---|---|
| **Theoretical documentation** | Venkatesh and Davis (2000)<br>Venkatesh (2000)<br>Kripanont (2006) | **$H_1$:** The intention to use smartphone telecommunication services determines their effective usage.<br>**$H_2$:** The perceived usefulness of the smartphone services influences the intention to use them.<br>**$H_3$:** The perceived ease of using smartphone services influences the intention to use them. |
| **Theoretical documentation** | Davis (1993)<br>Chuttur (2009) | **$H_4$:** The perceived ease of using smartphone services influences their perceived usefulness. |
| **Theoretical documentation** | Ajzen(1992)<br>Swilley (2010) | **$H_5$:** The social norm influences the intention to use smartphone services. |
| **Theoretical documentation** | Wejnert (2002)<br>Venkatesh et al. (2003)<br>Rogers (2003)<br>Sahin (2006) | **$H_6$:** The relative advantage of smartphone services influences the perceived usefulness.<br>**$H_7$:** The compatibility with the smartphone services influences the intention to use them.<br>**$H_8$:** The complexity of smartphone services influences the perceived ease-of-use.<br>**$H_9$:** Experimenting with smartphone services influences the perceived ease-of-use.<br>**$H_{10}$:** The conspicuity of smartphone services influences the intention to use them. |
| **The studies and professional training of the researcher** | The professional training and the managerial experience of the researcher | **$H_{11}$:** The online consultancy provided to users influences the perceived ease-of-use of smartphone services.<br>**$H_{12}$:** The users' daily tasks influence the perceived usefulness of smartphone services.<br>**$H_{13}$:** Providing smartphone services in the perks package influences the intention to use them.<br>**$H_{14}$:** The decision of the company management to promote smartphone services influences their effective use. |

| | | |
|---|---|---|
| **The analysis of the business context** (regional organization, branches, etc.) | The territorial pattern of distribution (flagship stores, distributors, partners, etc.) | **$H_{15}$:** Face-to-face consultancy influences the effective use of smartphone services.<br>**$H_{16}$:** Post-sale smartphone services influence the intention to use them.<br>**$H_{17}$:** Business trips influence the perceived usefulness of smartphone services. |

## The study of specialized literature

Taking into consideration the purpose of the research, the study of specialised literature focused mainly on two important aspects:

**A) The socio-psychological behaviour of consumers;**

People's behaviour has represented an important focus for the marketing specialists who want to promote their products and services. They have been preoccupied with identifying the consumers' needs in order to develop new products and facilitate their distribution and sale [120]. Throughout time, several theories related to the socio-psychological behaviour of people have been developed, and this paper presented them succinctly, namely:

- The Social Cognitive Theory
- The Rational Action Theory
- The Planned Behaviour Theory
- The ARCS Motivation Model

**B) The consumers' behaviour related to new technologies.**

The progress made in the field of technology caused major changes for producers, consumers and markets. The new wave of digital technology enables people to express themselves and to cooperate no matter where they are on the globe. What is needed in this context is "how" to make the most of these widespread and easily available technological benefits. Many researchers have dealt with the reasons why consumers accept and adopt new technologies and have developed several theories and models indicating the key elements, which bear on the extent of their usage.

Three of such theories have been presented in this paper as they were considered to play a major role in defining the research model:

- The technology acceptance model;
- The diffusion of innovation theory;
- The unified theory of acceptance and use of technology.

The Technology Acceptance Model (TAM) is one of the most popular and commonly used theories, which explains the reasons why users accept new technologies [10], and constitutes in this paper the foundation of the proposed research model. Conceptually, it is suggested that using a technological or information system is a response and can be explained or anticipated depending on the degree of motivation of the user, who, in his turn, is directly influenced by external stimuli represented by the characteristics, the parameters and the technical data of that respective system [1].

Apart from the theories adopted from specialised literature, the construction of the research model also used a series of variables identified during the professional training and the twenty-year managerial experience of the researcher.

The proposed model, deriving from this double approach, deductive and inductive, can be seen in Figure 4.2:

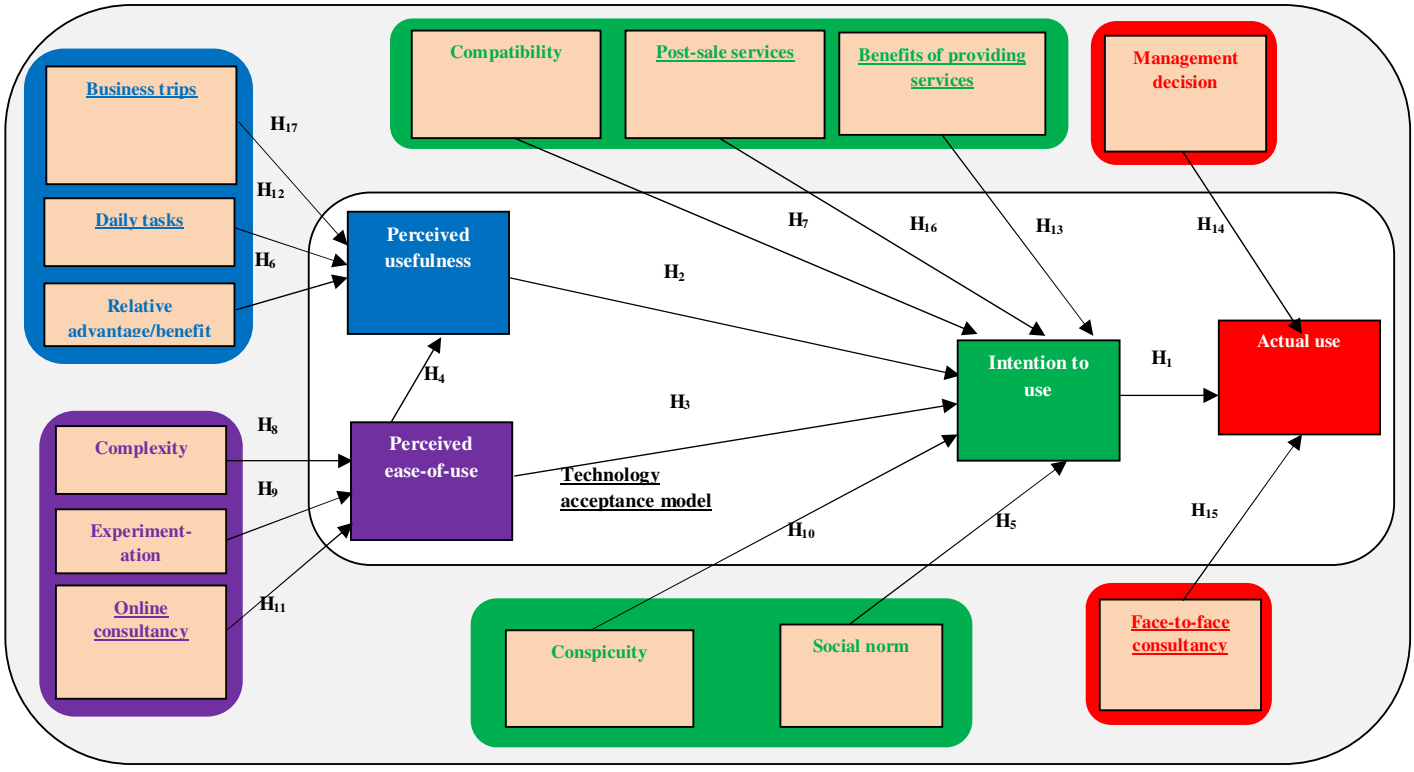


**Figura 4.2 The proposed research model**

# Field Study

The collection of data on the field ensured the connection between the theoretical framework of the research and the practical framework in a well defined temporal space.

In order to carry out this action and to ensure the fact that the final data would be relevant and practical, it was important to define the framework of the research and the research sampling frame and the way in which the research was operationalized on the field.

## The framework of the field research

The field research was carried out between February, 11 – February, 24 in three multinational companies with branches all over the country: a company activating in the field of sales and distribution of soft drinks (Coca Cola Hellenic Romania), a company activating in the field of mobile telecommunications (Vodafone Romania), and another company activating in the field of mobile telecommunication equipment repairs and distant communication systems (Cordon Electronics Romania).

The target group consisted of employees of the aforementioned companies which share common characteristics when it comes to using smartphone services: the provision of smartphones as communication tool between the employees, the existence of branches all over the country and the necessity to communicate between them, the circulation between the various branches for managing their activity, etc. The survey sample frame was made up of employees from the three aforementioned multinational companies using probability sampling.

## The operationalization of the field research

617 employees were sent the questionnaire via email, which informed them of the aim of the request, namely the completion of the on-line questionnaire and directed them to the link they needed to access http://www.sondaj.pyxis.ro/index.php/526827/lang-ro. Out of the sent questionnaires, 28, i.e. 4% were returned due to the fact that the respondents' addresses had not been identified, and 245 questionnaires, 40%, were not accessed. 344 questionnaires were accessed and out of these 37, i.e. 11% were incomplete; 307 questionnaires were complete and consequently used in further analyses in SPSS.

## The analysis of the internal consistency and instrument validity

The research method used for the collection of data on the field was **the investigation,** and the instrument used was **the questionnaire,** which was sent to respondents via email in order to be filled out online. The analysis of the internal consistency of the multi-item scale was carried out by determining the Cronbach Alpha coefficient, whose value for most items was at the same level or above the accepted value of 0.70, except the scale for Complexity which improved compared with the pre-testing stage of the questionnaire but never reached the appropriate level. The validity of the multi-item scale was tested through factorial analysis which expected the values of the *factorial saturations* of the items to reach the acceptable level of 0.5 [50]. In order to achieve these determinations the *Principal Component* method was used in two iterations: the former was related to the number of factors, and the latter used a number of factors with Eigen values higher than 1, using the *Promax with Kaiser normalization* rotation method.

As a result of the two factorial analysis iterations we obtained the necessary and sufficient conditions for validating the instrument, leaving a number of 41 items associated to 12 factors for further analysis, as the Complexity factor was eliminated entirely.

## Testing the hypotheses and the proposed research model

Two categories of analyses in SPSS and AMOS were developed during the research, which were in agreement with the two categories of established objectives, namely:

A) **Testing the hypotheses,** formulated in order to achieve the objectives related to the relations of influence between the factors believed to determine the effective behaviour of smartphone services users;

B) **Estimating the validity and the robustness of the research model** in order to achieve the objectives related to the construction and testing of the model related to smartphone services.

Thus, out of the 17 formulated and tested hypotheses, 11 hypotheses were confirmed using regression analyses: **H1, H2, H3, H4, H6, H7, H9, H11, H12, H14 and H17,** while six hypotheses were **rejected**: **H5, H8, H10**, **H13, H15, H16**.

## The final consolidation and validation of the model

In order to validate a research model that includes independent variables associated to several dependent variables, the regression analyses on the groups of dependent variables and the connection with the independent variables are necessary, but not sufficient to test and demonstrate the robustness of the model in its entirety [36]. The most widespread method of testing for a research model estimated in its entirety is the Structural Equation Model which allows the simultaneous analysis of several dependent variables.

Modelling based on structural equations fundamentally requires two stages in order to work:

- Stage 1: a preliminary analysis of the factors involved in the estimated model using the results from the hypothesis testing stage in SPSS 20;
- Stage 2: the modelling itself in AMOS 20 with the purpose of improving the robustness of the model in its entirety.

After following the two necessary stages a robust model was completed which includes the most relevant and statistically significant factors (Figure 6.8).

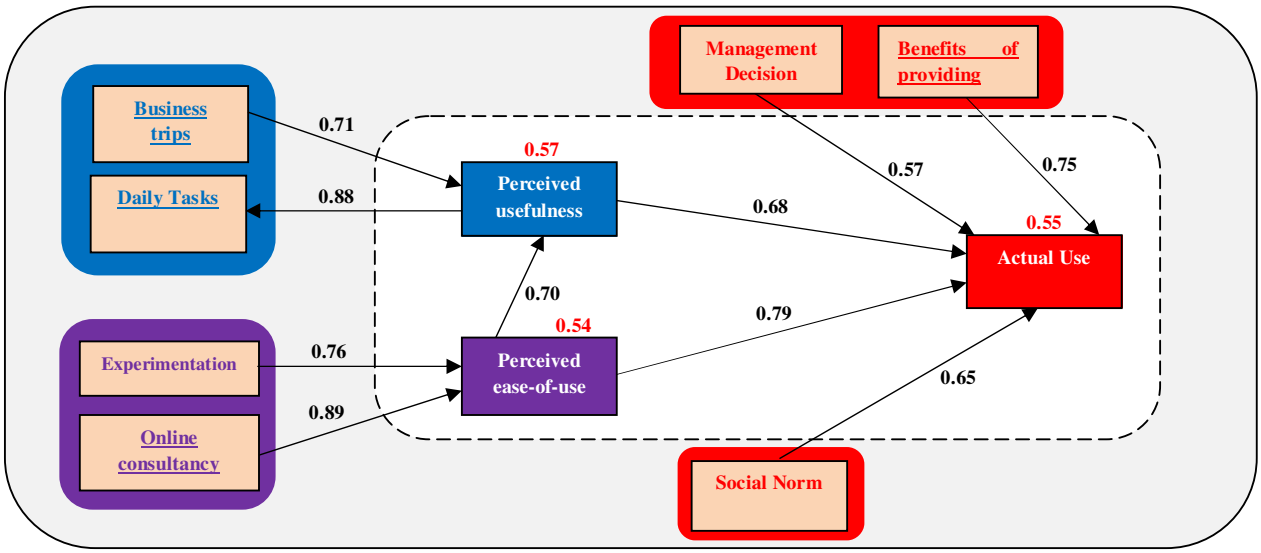


**Figure 6.8 Final research model**

As can be seen in the final model (Figure 6.8), three groups of factors were retained as significant in influencing the Effective Use (UEF) of smartphone services, as follows:

- Factors which influence directly, graphically represented on a red background (MD, BPS and SN), in a blue square (PU) and a purple square (PE);
- Factors which influence indirectly through Perceived Usefulness represented on a blue background (BT and DT) ;
- Factors which influence incorrectly through Perceived ease-of-use, represented on a purple background (EXP and OC).

## Conclusions

The evolution of the business world can be metaphorically seen as the story of the evolution of a village which in time became a town, then a region, a country and ultimately the Earth itself, where space and time faded gradually as **telecommunications** evolved. As a result of this interesting evolution, the research was carried out in the same field which evolves and develops rapidly.

As all researches, it started with a problem for which solutions are yet to be found, but a problem which has been a part of a dominant context. The context was formed and developed as telecommunications evolved, until it came to be known simply as the globalization of businesses on a global, regional and national level. The general question which constituted the starting point in understanding the research problem was: which factors influence business men in making them maximize the use of telecommunication services? In order to find an exhaustive answer, an analysis of the business context was carried out. It was noticed that many years ago, closing a deal meant communication in a physical form in order to transmit the necessary messages and information and the business environment was dominated by the **physical approach**. Businesses were completed locally within close geographical boundaries and people respected the so-called "culture or customs of the village" where everybody knew everybody and businesses followed a similar pattern. Nowadays, the business environment is dominated by the **virtual approach,** which is always brought up whenever telecommunications or "distant communication" are involved and in which people – as if they knew each other – share information in real time and businesses are done everywhere, even globally, tacitly respecting the same culture of the village but on a global scale.

Consequently, once the context was known, the problem needed to be identified specifically, and it can be summarized by asking a specific question: which are the smartphone facilities that business people use ? This question only covers a small part of the topic, as a correct analysis would imply a correlation with all smartphone facilities and its full potential.

In order to achieve the objectives and the aim of the research the following directions were followed:

A) The study of specialized literature from various fields collateral to the theme of the research

- Literature related to the socio-psychological behaviour, which led us to the **conclusion** that people are influenced in their decisions to buy products or services by both volitional and non-volitional factors;

- Literature connected to the acceptance of technologies by people, which led us to the **conclusion** that the more useful and easier to use the high technologies are perceived, the higher is the probability that they are more easily accepted;

B) The retrospective analysis in the field of communications in the company where the researcher gained professional experience. Many findings were confirmed by the theoretical framework, while others were indirectly connected to the evolution of the business environment.

Once the theoretical and practical foundations were laid, the field research was carried out in three multinational companies and led to the following **main conclusions:**

- The research sample was made up of 344 respondents, out of whom 94% were smartphone services users;
- The response rate was of 56% during two weeks of research;
- 11 out of the 17 formulated hypotheses were confirmed;
- The hypotheses related to the Technology Acceptance Model were confirmed in the course of this research;
- 4 out of the 6 hypotheses formulated by the researcher were confirmed;

Reaching the fundamental objective O1 - identifying the factors which influence the behaviour of smartphone services consumers – started from testing the hypotheses of the research which derived from a double approach, deductive and inductive.

Reaching the fundamental objective O2 – constructing and validating a research model applicable to the behaviour of smartphone services users – was achieved by projecting a model of analysis and perfecting it during the course of seven iterations in AMOS.

### Personal Contributions

The researcher's contributions consisted in a theoretical development derived from specialized literature and in identifying some managerial implications of the results of the research which equally determined the construction of a work flux, and the creation of some helpful means of analysis with impact on forming opinions in a structured manner.

The most relevant theoretical and fundamental research contributions are as follows:

- Formulating each hypothesis based on documentation;
- Creating a synthesis of the formulated hypotheses;
- Developing a comparative analysis of the factors related to the similarity of definitions found in different theories;
- A structured description, in stages, of the evolution of factors which have influenced the model related to the use of technologies;
- Developing a chronological synthesis for the last 20 years of the factors which have determined the acceptance of technologies;
- Developing the proposed research model by combining the factors selected from specialized literature with those identified in the personal experience;
- Creating the research instrument for the interview in the pretesting stage which also included a feedback form for collecting the respondents' opinions;
- The creation and personal development of the research instrument, the online questionnaire, without using predefined survey platforms in this environment.

These contributions which resulted from the analysis and synthesis of specialized literature are combined with those resulted from the professional experience and the field research.

The contribution brought by the researcher as a result of the professional experience and the field research materialized in the identification of elements which might have an impact on the preparation and documentation of further studies, on a theoretical and methodological level, such as:

- The study of specific information and the elaboration of graphs related to the evolution of smartphone sales per manufacturer over the last five years;
- The rough elaboration "beginning-end" of the pretesting process as well as the research process;
- The chronological analysis of accessing the questionnaires over two weeks with a daily measurement of the evolution;
- The creation of a consolidated frame profile for the research sample;
- The elaboration of a synthesis of the dependent and independent variables from the proposed model;
- The elaboration of a synthesis of the results of hypotheses testing and determined indicators;
- The development of the proposed model following the results of the hypotheses testing;
- The elaboration of a synthesis of the results of model robustness indicators during the seven iterations;
- The development of the final model with a presentation of all the links and robustness indicators values. The model resulted from the study of specialized literature and the experience gained in the field of mobile telecommunications was constructed by selecting and defining three groups of variables:

1) A group made up of variable related to the field of technology acceptance;
2) A group made up of variables related to the diffusion of innovations;
3) A group made up of variables related to the professional experience in the field of telecommunications.

## Directions for further research

A viable research which would offer an overview of the behaviour of those "interested" in smartphone services would be the study of the factors which influence the behaviour of non-users, with the purpose of converting as many of them as possible into users, thus maximizing the access and satisfaction, both of consumers and of mobile telecommunications operators. From the beginning of the research, the research instrument was conceived in a broader sense, and comprised questions for the users as well as the non-users of smartphone services.

In the last three years, the rapid technological progress determined the emergence of a multitude of mobile equipment with a high technological degree and very varied: ipod, ipad, e-book, notebook, laptops of all sizes. One of the common elements of this mobile equipment is the use of internet which facilitates the access of the necessary applications. In comparison with the rapid evolution of the technical progress, the rate at which the knowledge required in order to operate this equipment is acquired by the users is slow. Therefore, this discrepancy should be taken into consideration by mobile telecommunications operators in order to invest in research studies related to each of this equipment, with the intention of identifying the models and factors which influence and stimulate the use of services which derive from the facilities provided, in order to maximize them. Based on these data we can conclude that the higher the potential of equipment that incorporates high-tech technology, the more necessary and important the research studies in this field are.

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