



Master thesis

# Technology Acceptance Model Revised

*- An Investigation on the Managerial Attitudes  
towards Using Social Media in Innovation  
Processes*



*Authors:* Jennifer Austermann,  
Birte Mertins  
*Supervisor:* Setayesh Sattari  
*Examiner:* Anders Pehrsson  
*Date:* 30<sup>th</sup> May 2014  
*Subject:* Business Administration  
with major within Marketing  
*Level:* Master Thesis  
*Course code:* 4FE07E

# Abstract

**Purpose:** Currently little research exists regarding the attitudes of managers towards using social media for innovation processes. The purpose of this study is to investigate the factors that influence managerial attitudes and their willingness to use social media as a tool for generating innovations.

**Design/methodology/approach:** Based on existing literature within the technology acceptance field, a research model has been created. A deductive and quantitative research approach has been employed in order to test the hypotheses on 137 managers from international companies who use social media within their innovation processes.

**Findings:** The results of the linear regression show that three out of six hypotheses could be accepted. Perceived usefulness and subjective norms have an impact on the managers' attitude towards social media in innovation processes. Moreover, the findings reveal that the attitude towards using social media in innovation processes influences the managerial behavior intention.

**Research limitations/theoretical implications:** The research model of this study contributes to the already existing literature. It aims at explaining the managerial attitude towards social media integration into innovation processes, being based on the extended technology acceptance model (TAM2). Research limitations concern the model's application in different contexts for other technologies, the lack of balance of female and male respondents and the concentration on specific industries in which user-driven innovation is highly important. Future research is encouraged to take these factors into consideration.

**Practical implications:** Companies should support their employees' and managers' confidence in using social media for innovation processes by reinforcing the managerial perception of social media's usefulness. Managers and employees should be encouraged by external parties to use social media for example by attending workshops and advanced training courses or visiting conferences in order to appreciate its acceptability.

**Originality/value:** The study presents a new research model that investigates managerial attitudes towards social media integration into innovation processes based on the extended Technology Acceptance Model. The association of managerial attitudes, social media, innovation and TAM2 is novel within this field of research.

**Paper type:** Research paper

**Keywords:** Managerial attitudes, Social Media, Technology Acceptance Model, Innovation, Open Innovation, Online Communities

# Acknowledgements

Our master thesis has been written within the Marketing Master program at Linnaeus University in Sweden and was completed in June 2014. The thesis has been finalized with the help and support of a number of persons.

Thus, we would like to express our gratitude to our tutor Setayesh Sattari who supported us with her advice and guided us throughout our research process. Furthermore, we would like to thank our examiner Anders Pehrsson, as he provided us with valuable help and instructions even beyond our tutoring sessions. A special gratitude goes to the participants of our study since they shared their valuable time and opinions with us. Especially, we would like to thank all of those who took a closer look at our study, namely Chris Atkinson, Dr. Bruno Austermann, Kristina Brohl, Sandra Fischhöfer, Ibolya Maricic and Antje Miesen.

Last but not least, we are also grateful for the assistance of our friends and family during our time of our studies and finally our graduation.

Linnæus University, 2014

Jennifer Austermann

Birte Mertins

# Table of contents

List of figures .....	vi
List of tables.....	vii
List of abbreviations .....	viii
<b>1 Introduction.....</b>	<b>1</b>
<b>1.1 Background .....</b>	<b>1</b>
<b>1.2 Problem Discussion.....</b>	<b>2</b>
<b>1.3 Purpose .....</b>	<b>3</b>
<b>1.4 Delimitations.....</b>	<b>3</b>
<b>1.5 Thesis Outline.....</b>	<b>4</b>
<b>2 Literature Review .....</b>	<b>5</b>
<b>2.1 Innovation.....</b>	<b>5</b>
2.1.1 Definition and Importance.....	5
2.1.2 From Closed to Open Innovation .....	6
2.1.3 Open Innovation .....	6
<b>2.2 Web 2.0 .....</b>	<b>7</b>
2.2.1 Definition of the Internet.....	7
2.2.2 Definition of Social Media .....	7
2.2.3 Social Media and Innovation .....	8
<b>3 Conceptual Framework.....</b>	<b>11</b>
<b>3.1 Technology Acceptance Model (TAM) .....</b>	<b>11</b>
<b>3.2 Perceived Usefulness (PU).....</b>	<b>12</b>
<b>3.3 Perceived Ease of Use (PEU).....</b>	<b>12</b>
<b>3.4 Perceived Behavior Control (PBC) .....</b>	<b>13</b>
<b>3.5 Subjective Norm (SN) .....</b>	<b>13</b>
<b>3.6 Personal Innovativeness (PIIT) .....</b>	<b>14</b>
<b>3.7 Attitude towards Using (ATT).....</b>	<b>14</b>
<b>3.8 Behavior Intention (BI) .....</b>	<b>15</b>
<b>3.9 Conceptual Model of this Study .....</b>	<b>15</b>
<b>4 Methodology.....</b>	<b>16</b>

<b>4.1</b>	<b>Research Approach and Design.....</b>	<b>16</b>
<b>4.2</b>	<b>Data Sources.....</b>	<b>17</b>
<b>4.3</b>	<b>Research Strategy .....</b>	<b>18</b>
<b>4.4</b>	<b>Time Horizon.....</b>	<b>19</b>
<b>4.5</b>	<b>Data Collection Method.....</b>	<b>19</b>
<b>4.6</b>	<b>Type of Questionnaire .....</b>	<b>21</b>
<b>4.7</b>	<b>Survey Content.....</b>	<b>21</b>
<b>4.8</b>	<b>Sampling .....</b>	<b>24</b>
<b>4.9</b>	<b>Missing Data .....</b>	<b>26</b>
<b>4.10</b>	<b>Data Analysis Method .....</b>	<b>27</b>
<b>4.11</b>	<b>Quality Criteria.....</b>	<b>28</b>
4.11.1	Reliability .....	28
4.11.2	Validity .....	29
<b>4.12</b>	<b>Overview of Research Process.....</b>	<b>30</b>
<b>5</b>	<b>Results and Analysis .....</b>	<b>31</b>
<b>5.1</b>	<b>Results .....</b>	<b>31</b>
5.1.1	Descriptive Data .....	31
5.1.2	Descriptive Statistics.....	35
5.1.3	Reliability .....	38
5.1.4	Validity .....	38
5.1.5	Hierarchical linear Regression .....	39
<b>5.2</b>	<b>Testing of Hypotheses.....</b>	<b>42</b>
<b>6</b>	<b>Discussion .....</b>	<b>44</b>
<b>7</b>	<b>Conclusion and theoretical contributions.....</b>	<b>48</b>
<b>7.1</b>	<b>Conclusion .....</b>	<b>48</b>
<b>7.2</b>	<b>Theoretical Contributions .....</b>	<b>49</b>
<b>8</b>	<b>Limitations, managerial implications and further research.....</b>	<b>51</b>
<b>8.1</b>	<b>Managerial Implications .....</b>	<b>51</b>
<b>8.2</b>	<b>Limitations.....</b>	<b>52</b>
<b>8.3</b>	<b>Further Research .....</b>	<b>53</b>
<b>References .....</b>		<b>55</b>
<b>Appendices.....</b>		<b>I</b>
<b>Appendix A: Questionnaire.....</b>		<b>I</b>

<b>Appendix B: List of Groups .....</b>	<b>VIII</b>
<b>Appendix C: Correlation between different items.....</b>	<b>XI</b>
<b>Appendix D: Examples of group statistics (screenshots).....</b>	<b>XII</b>
<b>Appendix D: Output SPSS .....</b>	<b>XIV</b>

# List of figures

Figure 1: Report Structure.....	4
Figure 2: Social Media Triangle (based on Ahlqvist <i>et al.</i> , 2008).....	8
Figure 3: TAM2 (Venkatesh and Davis, 2000).....	11
Figure 4: Conceptual Model for this Study.....	15
Figure 5: Overview of Research Process .....	30
Figure 6: Distribution of Gender.....	31
Figure 7: Age Groups.....	32
Figure 8: Location of Headquarter .....	33
Figure 9: Use of Social Media for Innovation Processes per Day .....	34
Figure 10: Use of Social Media for Innovation Processes per Week .....	35

## **List of tables**

Table 1: Operationalization Table.....	22
Table 2: Overview of the Respondents' Function within the Company .....	32
Table 3: Descriptive statistics and Pearson correlation coefficients.....	37
Table 4: Overview of Cronbach's alpha.....	38
Table 5: Ordinary Least Squares Regression .....	39
Table 6: Testing of Hypotheses .....	42

## **List of abbreviations**

ATT	Attitude towards using
BI	Behavior Intention
BMW	Bayrische Motorwerke
CEO	Chief Executive Officer
NPD	New Product Development
PBC	Perceived Behavior Control
PEU	Perceived Ease of Use
PIIT	Personal Innovativeness
PU	Perceived Usefulness
R&D	Research and Development
SN	Subjective Norm
SPSS	Statistical Package for the social sciences
TAM	Technology Acceptance Model
TAM 2	extended Technology Acceptance Model

# 1 Introduction

*This chapter presents the background to the research area, the problem discussion, the purpose and the limitations and the study's outline.*

## 1.1 Background

Innovation consists of a multi-stage process in which companies alter ideas with the aim of developing new and improved products, services or processes as well as of enhancing, differentiating and competing within their market area (Baregheh *et al.*, 2009). In the past, mainly traditional, manufacturer-centric innovation took place in which manufacturers developed and serviced products and services in a closed way by using copyright, patents and other forms of protection (von Hippel, 2005).

Nowadays, companies aim to decrease the risk that users might not accept their products and services by opening up their internal innovation procedures to external parties, including customers, which is called the “user-centric innovation process” (von Hippel, 2005; Bilgram *et al.*, 2008). Innovation communities can take several forms and can take place on the Internet, too. User-centered innovation acts as an influential tool which continues to increase due to digitalization and advances in communications technology (von Hippel, 2005). Since there is an increase of digitalization of the Internet, user innovation platforms are growing at an exponential rate (Mahr and Lievens, 2012; Franke and Shah, 2003). International examples taken from different industries are the BMW M Power community (automotive), My Starbucks Idea (retailing) and Dell IdeaStorm (high-tech) (Mahr and Lievens, 2012). The idea behind these innovation platforms is to involve customers in the innovation process.

Studies have been made of the relationship between Internet and innovation, especially in the social media context (Ernst *et al.*, 2013; Kaplan and Haenlein, 2010; Piller *et al.*, 2012). At the present time, innovation is democratized since users of products and services possess the capabilities to innovate for themselves (von Hippel, 2005). Users can be both individual consumers and firms, which engage in developing and modifying products according to their needs and wishes (von Hippel, 2005). Due to the increase of social media, the process of innovation management is transformed (Ernst *et al.*, 2013). Social media applications, which can be divided into several categories like “collaborative projects, blogs, content communities, social networking sites, virtual

game worlds, and virtual social worlds" (Kaplan and Haenlein, 2010, p.59), offer many platforms for the development of potential innovation.

## 1.2 Problem Discussion

Recently, companies have realized that innovative products are not the result of a company's internal innovation but of interactive and open relationships between companies, users and other institutions (Laursen and Salter 2006; Reichwald and Piller, 2009). Several authors have shown that innovation that is based on a high level of integration of external drivers provides several advantages, for example it has shorter lead times and as well as lower investment (Mansfield, 1986), or low communication costs (Baldwin and von Hippel, 2009). The innovation process is complicated, but it is necessary for every company (von Hippel, 1988; 2005). Only when a company provides new, innovative and customized products it can remain successful on the market (von Hippel, 1988). According to Culnan *et al.* (2010) social media are used to increase the fit of products to market needs and to save costs in terms of research and development. However, social media also have a powerful impact outside the company, e.g. they change established market structures and create new markets like mobile applications (Kaplan and Haenlein, 2010). Furthermore, they influence the behavior of competitors and customers within the market, for example by word-of-mouth (Kaplan and Haenlein, 2010). Social media behavior and its usage have been mostly studied in a private environment (Kärkkäinen *et al.*, 2011), instead of making use of them for business purposes. Moreover, a good deal of the literature is concentrated only on the use of social media in business and marketing in general (Trainor, 2012; Narayanan *et al.*, 2012; Rodriguez *et al.*, 2012; Agnihotri *et al.*, 2012) and not many focus on the integration of social media into innovation processes. Therefore, it is important to look at individual attitudes towards using social media, since recent studies have demonstrated that new technologies, including social media, are not always accepted by managers (Mangold and Faulds, 2009). Though consumer discussions via social media are powerful, managers are likely to reject social media's importance (Mangold and Faulds, 2009). It is essential to study managerial attitudes towards using social media as they provide a number of benefits for companies which can lead to a better performance of a company (Kaplan and Haenlein, 2010). As the aforementioned information reveals, a research gap exists which is connected to the lack of studies regarding the connection between managers' attitudes, their social media usage and employing social media as a tool in the innovation processes. In the past, Rogers (1983) has found that a person's personal innovativeness might determine the extent of their abilities to handle uncertainty and to create a positive attitude towards new innovations. The concept of personal innovativeness has been a subject of former studies and requires additional investigation (Lewis *et al.*, 2003; Lu *et al.*, 2005).

In addition, media attitudes and behaviors are described as a complex phenomenon, influenced by factors like (1.) the characteristics of situations, (2.) the social environment and (3.) the person itself (Treviño *et al.*, 2000). This paper will stress the second and third factors and will explain in which way attitude towards and the usage habits of social media are reflected in the utilization of social media in innovation processes. The knowledge about personal factors in relation to new technologies also represents the personal skills and views according to their attitudes (Treviño *et al.*, 2000).

Previous studies about social media behavior have shown a high interest in newer communications technologies (Treviño *et al.*, 2000), but there is a lack of research on the connection between the managerial attitude, the use of social media in the innovation process and innovation. As shown before, it is apparent that managers might receive a competitive advantage when integrating external persons into their innovation processes through social media (Lievens and Mahr, 2011). So, the research gap shows the necessity of investigating attitudes in connection to employing social media in innovation processes as they might influence the use of social media within business environments. It can be assumed that the attitude of managers towards technologies and on the intention to use them has an effect on their company's use of social media. Therefore, this study will investigate this relationship.

### **1.3 Purpose**

The purpose of this study is to investigate on factors and relationships that influence managerial attitudes and the intention to use social media as a tool for generating innovations.

### **1.4 Delimitations**

First of all, one delimitation is the decisions made within the methodology. These decisions have an impact on the research approach, the empirical data gathered and the results.

Another delimitation is the choice of managers to participate in the study. Since most of them were approached through social media channels, it is difficult to draw general conclusions from their answers. The reason is that managers who are not employing social media might have been excluded from the study. Furthermore, the time frame of the data collection was highly restricted. Therefore, managers who were engaged on other activities had no chance to fill out the questionnaire. Besides, it is has to be taken into account that managers give their opinions based on individual and subjective preferences.

## 1.5 Thesis Outline

<b>1</b>	<b>Introduction</b>
	Background, justification for conducting this study, purpose and delimitations
<b>2</b>	<b>Literature review</b>
	Definition of key terms, theory reviewed from different angles
<b>3</b>	<b>Conceptual framework</b>
	Theoretical background, model and hypotheses
<b>4</b>	<b>Methodology</b>
	Research process, decisions concerning data collection and analysis method
<b>5</b>	<b>Results and Analysis</b>
	Findings, statistical analysis, testing the hypotheses
<b>6</b>	<b>Discussion</b>
	Empirical findings are discussed in relation to the literature
<b>7</b>	<b>Conclusion and theoretical contributions</b>
	Summary, answering the purpose and theoretical contributions
<b>8</b>	<b>Limitations, managerial implications and further research</b>
	Limitations of the study, practical recommendations and suggestions for further research

Figure 1: Report Structure

## **2 Literature Review**

*The previous chapter gave an introduction to the area of research. This chapter covers the theories used related to the research topic. Therefore, the subjects innovation, Web 2.0 and social media are reviewed.*

### **2.1 Innovation**

#### **2.1.1 Definition and Importance**

Innovation is tightly linked with change, because through innovation activities the internal and external environment can be influenced or transformed by organizational institutions like companies (Damanpour, 1991). Diverse outputs of the company can be influenced or changed through innovation, such as the creation of new products, materials, processes, services, and organizational forms (Ettlie and Reza, 1992).

Different definitions have evolved for the term innovation. However, innovation is characterized to be a very complex phenomenon and so it is not possible to provide a general definition (Ernst *et al.*, 2013). One often quoted definition is that “innovation is conceived as a means of changing an organization, either as a response to changes in the external environment or as a pre-emptive action to influence the environment. Hence, innovation is here broadly defined to encompass a range of types, including new product or service, new process technology, new organization structure or administrative systems, or new plans or program pertaining to organization members.” (Damanpour 1996, p.694). Furthermore, the definition of innovation differs according to different disciplinary perspectives. For example, Plessis (2007) focuses on knowledge management and states that knowledge is crucial for innovation and proposes that innovation is “[...] the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market driven products and services. Innovation encompasses both radical and incremental innovation” (Plessis, 2007, p.21). Researchers focusing on technology define innovation as a connection between the creation of the new product and the new technology (Nord and Tucker, 1987).

To summarize all the different definitions, they have in common that innovation is the production of something new and it has to be adopted (van der Meer, 1996; West and Farr, 1990). According to Westland (2008), innovation is the commercialization of an invention. Due to these characteristics,

an innovation has to be separated from an invention, because an invention is something new but it is not adopted (Adair, 2007).

On the basis of these explanations of what innovation is, a common understanding emerges which can be used. Even at the beginning of the last century, researchers recognized the importance of innovation. One of them was Schumpeter (1950), who argued that companies have to innovate in order to renew their assets. Today's, marketplaces are tremendously dynamic, hence there is a high interest in innovation (Baregheh *et al.*, 2009). Innovation can be seen as the response of organizations to changing customer demand and needs, with the objective of increasing income through new technologies or changing market structures (Baregheh *et al.*, 2009).

### **2.1.2 From Closed to Open Innovation**

Innovation processes have developed over time from closed to open. “Closed innovation” means that companies innovate in isolation, because they need a large input of internal capabilities (Nelson and Winter, 1982). According to Chesbrough (2003), it comes to closed innovation when companies generate ideas only within their own walls; thus the R&D departments of those companies typically have large research laboratories. Partners are partially involved vertically (Chesbrough 2003). Several researchers have shown that innovation with a focus on external input is more beneficial for the company than acting in isolation (von Hippel, 1988; Chesbrough, 2003; Chesbrough *et al.*, 2006).

### **2.1.3 Open Innovation**

One reasonable definition of open innovation is “the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation” (Chesbrough, 2006, p. 1). Recent research in the field of open innovation acknowledges the necessity of companies to identify, integrate and use the knowledge of external actors with the purpose of creating innovations for the market (Enkel *et al.*, 2009; Gassmann, 2006; Hsiehm and Tidd, 2012; Huizingh, 2011). External actors innovate at such a pace and high volume that companies are not able to match this innovation speed and knowledge creation (Vanhaverbeke *et al.*, 2007). The advantages of collaboration between companies and customers across all the different steps during the innovation process are (1.) the improvement of speed and effectiveness in the process (Carbonell *et al.*, 2009) and (2.) the execution of new products within the market (Gruner and Homburg, 2000) because of an in-depth understanding of the needs of both market and customer (Barclay, 1992; Hart *et al.* 1999; Cooper, 1993). In the context of open innovation the term “(customer) co-creation” is used to describe a company’s strategies of collaboration with customers, including different tools that are provided by the company to the customer (Piller and

Walcher, 2006). In summary, co-creation can be explained as the development away from the traditional customizing approach towards the creation of new products via the involvement of customers. In the concept of customization, value is viewed as something that can be built into a product or service during the production process (Kristensson *et al.*, 2004).

Open innovation invites users to make suggestions about innovative products at an early stage of the New Product Development (NPD) process (Kristensson *et al.*, 2004). When co-creators participate in the NPD, products are e.g. more creative, have a higher value for customers and therefore they are more easily to market (Kristensson *et al.*, 2004).

## 2.2 Web 2.0

### 2.2.1 Definition of the Internet

The Web 2.0 is defined as Internet platforms in which users can be involved by participating actively by communicating, cooperating and creating content (Enders *et al.*, 2008). The evolution of the Internet has affected the internal and external processes a company faces by offering new possibilities of collaboration and co-creation between companies and customers (Ernst *et al.*, 2013). Therefore, it is crucial for companies to take the Internet into consideration when devising business strategies that can be influenced by the development of the Internet and open innovation in general (Ernst *et al.*, 2013). Due to the fact that participation is seen as an important characteristic of the Web 2.0, its applications and technologies give customers the possibility of organizing, assembling, locating, and sharing content freely (Kärkkäinen *et al.*, 2011). This new way of content creation has been termed “social media” (Ernst *et al.*, 2013) which can consist of tools and applications like wikis, blogs, online communities and virtual worlds. That provide new business opportunities as well as challenges (Busscher, 2013). The Web 2.0 is regarded as the basis of the development of social media (Kaplan and Haenlein, 2010). Examples of social media platforms are Facebook, LinkedIn, Tumblr, or are created by companies like BMW M Power community and My Starbucks Idea (Mahr and Lievens, 2012).

### 2.2.2 Definition of Social Media

Social media represent interactive, Internet-based applications that are created using the technical capabilities of the Web 2.0 that allows groups and communities to create and exchange user generated content (Kaplan and Haenlein, 2010). Social media can be divided into three main groups, namely (1.) the aforementioned Web 2.0, (2.) content, which is user-generated and (3.) communities and networks, represented in Figure 2 (Ahlqvist *et al.*, 2008). Thus, social media can

be understood as applications which involve user-created content or activities that are essential for the increase of value of a particular online application or service (Kärkkäinen *et al.*, 2011). Many examples of online communities exist in which individuals and groups develop and share content (Busscher, 2013; Kärkkäinen *et al.*, 2011). These include a variety of online tools, which are labeled as: “collaborative productions (e.g. Wikipedia), social content communities (e.g. YouTube, Flickr, Digg), blogs (e.g. company newsrooms), microblogs (e.g. Twitter), intermediaries (e.g. InnoCentive), mash-ups, social networking sites (e.g. LinkedIn, Plaxo, Facebook), prediction markets, social workspaces (e.g. SharePoint) and virtual social worlds (e.g. Second Life)” (Kärkkäinen *et al.*, 2011, p.2).

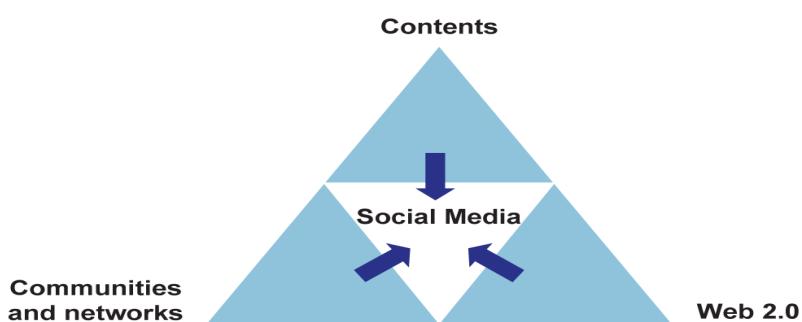


Figure 2: Social Media Triangle (based on Ahlqvist *et al.*, 2008)

### 2.2.3 Social Media and Innovation

#### *Reasons for companies to include social media in business processes*

Companies' interest in using social media in their business and marketing activities is increasing (Busscher, 2013). Different companies have diverse reasons for integrating social media into various activities (Busscher, 2013; Piller *et al.*, 2012). The reasons for companies using social media in marketing is to receive traffic on their website, facilitate viral marketing, create customer loyalty and to maintain customers (Piller *et al.*, 2012). Sales activities are based on the motivation to increase revenue and customer support, and service is expected to save costs and enhance customer satisfaction (Piller *et al.*, 2012). Lastly, the reasons for integrating social media into business activities are to develop products which fit customer needs and to save costs for the product development process (Piller *et al.*, 2012).

Social media have changed the way companies do business nowadays (Busscher, 2008; Ernst *et al.*, 2013; Gallaugher and Ransbotham, 2010). This change has led companies to communicate differently with external parties, resulting in social media being seen as having an influence on business processes (Busscher, 2013). As a result, social media facilitates a transformation of the

traditional roles of companies and customers which is characterized as switching the orientation from companies “only” using customers’ knowledge to co-creation with them (Ernst *et al.*, 2013; Kärkkäinen *et al.*, 2011).

### *Social media advantages and disadvantages*

Social media provide many advantages for companies since they helps them to collect customer information and to manage customer relationships with the help of tools by assembling information about customers (Busscher, 2013; Gallaugh and Ransbotham, 2010). Customers serve as a source of knowledge, as they are the future purchasers of companies' products and services (Lievens and Mahr, 2012). Thus, they are able to communicate their needs and desires to companies which can modify and develop the products based on the customers' input (Lievens and Mahr, 2012). Social media allow companies to communicate with their customers on a lower cost level and with higher efficiency compared to traditional tools of communication (Kaplan and Haenlein, 2010).

However, social media also create challenges for companies (Ernst *et al.*, 2013; Piller *et al.*, 2012; Gallaugh and Ransbotham, 2010) and therefore it is crucial that companies have to be aware of the risks involved in including social media in their business processes (Ernst *et al.*, 2013). The lack of control regarding the distribution of content, privacy and security challenges as well as the possible spread of a company's confidential information, are some examples of disadvantages (Ernst *et al.*, 2013). During innovation processes, the customers' knowledge is debatable since the knowledge might be limited and hence, the customers' input in innovation processes may not generate valuable information for product or service innovations (Lievens and Mahr, 2012). Due to the fact that there is a growing number of companies which organize innovation activities via social media, the risk exists that companies might need to compete for innovating customers in order to convince them to engage in their innovation processes (Piller *et al.*, 2012). In addition, some companies expose themselves to security risks if they use social media tools because of the Internet's uncontrollable nature (Gallaugh and Ransbotham, 2010). To conclude, social media provide new risks, which are due to their rapid and open nature, which have to be taken into consideration by companies (Ernst *et al.*, 2013).

### *Social media – importance for innovation*

As previously stated, social media can be described as an interactive tool, which enables groups and communities to create and exchange user-generated content (Kaplan and Haenlein, 2010). Consequently, social media offer new ways of collaboration and interaction between customers and

companies, enabling innovation processes between the two parties (Kärkkäinen *et al.*, 2011). This customer integration can extend from developing ideas for novel products to co-creation with companies, as well as running trials and providing support (von Hippel, 1988; Kärkkäinen *et al.*, 2011).

### 3 Conceptual Framework

This chapter presents the Technology Acceptance Model (TAM) that is the key concept behind the study's purpose. Furthermore, the research model is presented.

#### 3.1 Technology Acceptance Model (TAM)

This study is based on the extended TAM which consists of different factors that will be presented in the following chapter. TAM inspects the influence of technology on a user's behavior and was developed by Davis (1986) with the aim of establishing a theory of a user's computer technology behavior (Rauniar *et al.*, 2014). This model was originally developed from another theory, called the "theory of reasoned action" (TRA) that describes a person's behavior by their intentions and was founded by Fishbein and Ajzen (1975) (Rauniar *et al.*, 2014). The TRA model intends to create a theory which describes human behavior in general, whereas TAM focuses on the factors which influence a person's general computer acceptance (Rauniar *et al.*, 2014). The TAM consists of two main factors, "Perceived Usefulness" (PU) and "Perceived Ease of Use" (PEU) that influence a person's intention to make use of a technology (Davis, 1986; Liu *et al.*, 2010). Venkatesh and Davis (2000) extended the original TAM model by creating TAM2 which included additional factors, namely of "social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use)" (p.187). In fact, their study reveals that the TAM2 model offers more in-depth information than the ordinary TAM model by explaining the key factor of perceived usefulness which is the pre-step of usage behavior (Venkatesh and Davis, 2000). Furthermore, TAM2 uncovers that subjective norms, which are one factor of TRA (Fishbein and Ajzen, 1975), affect the usage intentions directly, having a larger influence than perceived usefulness and perceived ease of use (Venkatesh and Davis, 2000). Figure 3 illustrates the different factors of TAM2 and their relationships.

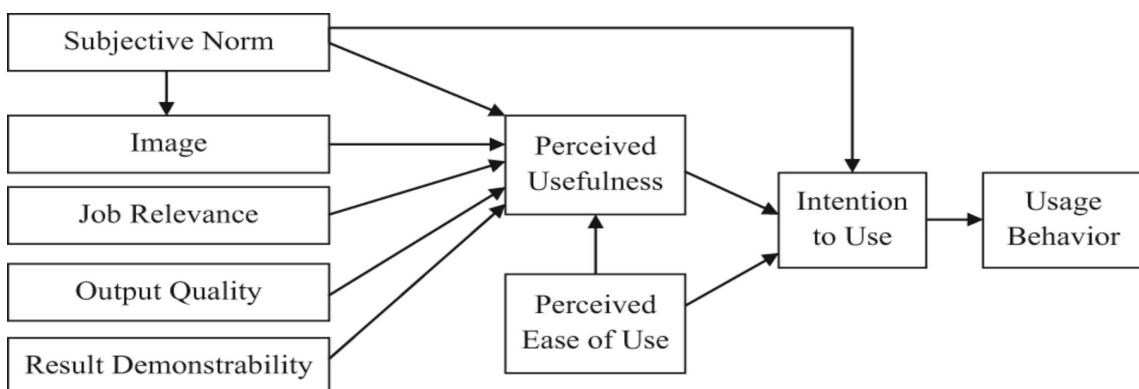


Figure 3: TAM2 (Venkatesh and Davis, 2000)

Nevertheless, TAM only gives a general view on a person's technology acceptance (Liu *et al.*, 2010). Thus, it has been applied to different contexts by past researchers, for example in the mobile business (Sun *et al.*, 2009), online learning communities (Liu *et al.*, 2010); or core banking systems (Nath *et al.*, 2014).

By applying the extended TAM approach to this study, the author's goal of this paper is to show several factors that affect the acceptance and attitude of managers towards social media integration for innovation processes. As the TAM is only a general model, it is applied to the study's context by adding the following variables to perceived usefulness (PU) and perceived ease of use (PEU): Perceived behavioral control (PBC), subjective norm (SN), behavioral intention (BI), personal innovativeness (PIIT) and attitude towards using (ATT) social media.

### **3.2 Perceived Usefulness (PU)**

PU is defined as "the extent to which a person believes that using a particular system will enhance his or her job performance" (Sun *et al.*, 2009, p.52). Consequently, it is related to the belief that a technology enhances an individual's performance (Liu *et al.*, 2010). The TAM and its extended models from other researchers uncovers that PU enhances a person's objective in mandatory and voluntary situations (Verkasalo *et al.*, 2010). However, past research has shown that there is a contrary result related to the effect which PU has on a person's usage behavior of a new technology system (Verkasalo *et al.*, 2010). This inconsistency of results leads to the question to which extent a person adopts social media, as PU and social media acceptance is an emerging research field. For the purpose of this study, PU is connected to social media in the following way: It represents the degree to which an individual that uses social media considers social media to meet his/her goal of integrating it into the innovation process (Rauniar *et al.*, 2014). Thus, the assumption is made that the PU of social media influences a manager to use this technology in innovation processes. Nath *et al.* (2014) showed that PU influences a person's attitude towards using their technology. Therefore, the first hypothesis is stated as:

**H1: The manager's perceived usefulness of social media influences the attitude towards using them in innovation processes.**

### **3.3 Perceived Ease of Use (PEU)**

PEU is "the extent to which a person believes that using a particular system will be free of effort" (Sun *et al.*, 2009, p.52). Studies validated that when individuals think employing a certain technology is easy to use, they will be inclined to work with it (Davis, 1986; Liu *et al.*, 2010).

Connecting this fact to social media, it is assumed that if social media are easy to handle, managers will make use of it. As in the case of PU, PEU has an influence on a person's attitude towards using their technology system (Nath *et al.*, 2014).

**H2: The manager's perceived ease of use of social media influences the attitude towards using them in innovation processes.**

### **3.4 Perceived Behavior Control (PBC)**

PBC is characterized by the description of perceived ease or difficulty a person has in performing a certain behavior (Ajzen, 1991). On the one hand, a common assumption is that control beliefs are the determiners of PBC. On the other hand, PBC is the determinant of BI and PEU (Ajzen, 2002; Venkatesh *et al.*, 2003). From a psychological view, the PBC factor is of high importance because of its impacts on intentions and actions (Ajzen, 1991). The knowledge about PBC is based on a research program initiated by Bandura (e.g., Bandura *et al.*, 1977; Bandura *et al.*, 1980). One result of these studies is that the confidence concerning someone's ability to perform a special activity highly influences that person's behavior. Furthermore PBC, in combination with BI, has a bearing on the end-behavior. One example would be a situation where two people would like to learn skiing. The experience shows that the person who is confident that he or she can manage this challenge will have faster and better success when learning skiing than a person who has doubts in his/herself (Ajzen, 1991).

**H3: The manager's PBC influences the attitude towards using social media in innovation processes.**

### **3.5 Subjective Norm (SN)**

According to Fishbein and Ajzen (1975) SN describes "a person's perception that most people who are important to him think he should or should not perform the behavior in question" (p. 302). According to Venkatesh and Davis (2000), SN and its resulting social influence and social pressure are the explanation of why a person behaves in a specific way that might be not typical for him or her. In several studies, researchers have shown that SN is the pre-step which anticipates behavior intention (BI) (Venkatesh and Davis, 2000; Ramayah *et al.*, 2009).

Lewis *et al.* (2003) show contrary results, as their study demonstrated that departmental peers, senior leaders and other social influences have no impact on new technology adoption. Therefore,

the authors of this study see a need for investigating whether social influences such as peers, supervisors, etc. have an effect on the attitude towards using social media in the innovation process.

**H4: Peers or senior leaders influence the SN of managers concerning their attitude towards using social media in innovation processes.**

### **3.6 Personal Innovativeness (PIIT)**

PIIT assumes that highly innovative persons possess certain characteristics like curiosity, searching for novel ideas (Lu *et al.*, 2005), being able to deal with uncertainty and an increased positive attitude towards technology acceptance in general (Rogers, 1983; Lu *et al.*, 2005). Based on Lewis *et al.*'s (2003) study which includes a survey for investigating how persons working at the institutions deal with IT in general, PIIT was added to the PU and PEU of TAM. Moreover the results demonstrate that PIIT had an effect on PU and PEU and that the influence on the PEU was larger than on PU, regarding their investigated technology (Lu *et al.*, 2005). However, Lu *et al.*'s study (2005) focused on wireless Internet services via mobile technology so there is a need to investigate PIIT in the context of social media.

**H5: The managerial PIIT influences the attitude towards social media in innovation processes.**

### **3.7 Attitude towards Using (ATT)**

All factors presented above such as PEU, PU, PBC, SN and PIIT have an impact on the factor ATT. Additionally, it is assumed by previous researchers that ATT has an influence on BI (Fishbein and Ajzen, 1975). ATT defines the “attitude towards” – in this case – the managerial adoption of new technologies such as social media in business (Nath *et al.*, 2014).

Attitude is a general term that describes and defines specific behavior (Fishbein and Ajzen, 1975). Concepts that are summarized as attitude are for instance attraction, liking and BI, which explain aspects like brand loyalty, brand images and general attitude towards product (Fishbein and Ajzen, 1975). In other words, attitude is not a behavior in itself but it is a disposition that influences a particular behavior of people (Fishbein and Ajzen, 1975). In the context of the theory of reasoned action (TRA) and based on Ajzen and Fishbein's (1980) research, every human action is based on intentions. These intentions are influenced by the person's attitude (Ajzen and Fishbein, 1980). TAM is based on TRA and when investigating ATT in context of TAM, several empirical studies

have exposed the intention and the actual usage from a technical system is impacted by the user's attitude (Hassanein and Head, 2007).

**H6: The attitude towards using social media in innovation processes influences the managerial behavior intention.**

### 3.8 Behavior Intention (BI)

The BI is the most important factor of Fishbein and Ajzen's (1975) theory of reasoned action, which is commonly used for forecasting behavioral intentions and behaviors. According to the TRA, BIs are the pre-steps before an individual displays a special behavior. Therefore, BI influences a person's actions under the condition that the person assumes a relationship between the outcome and a definite behavior (Liu *et al.*, 2005).

### 3.9 Conceptual Model of this Study

Based on the theoretical concepts that are presented in the conceptual framework, the authors have created the following model. The items that are presented in the conceptual model which was created for this study, were chosen because of their importance and high relevance in previous literature.

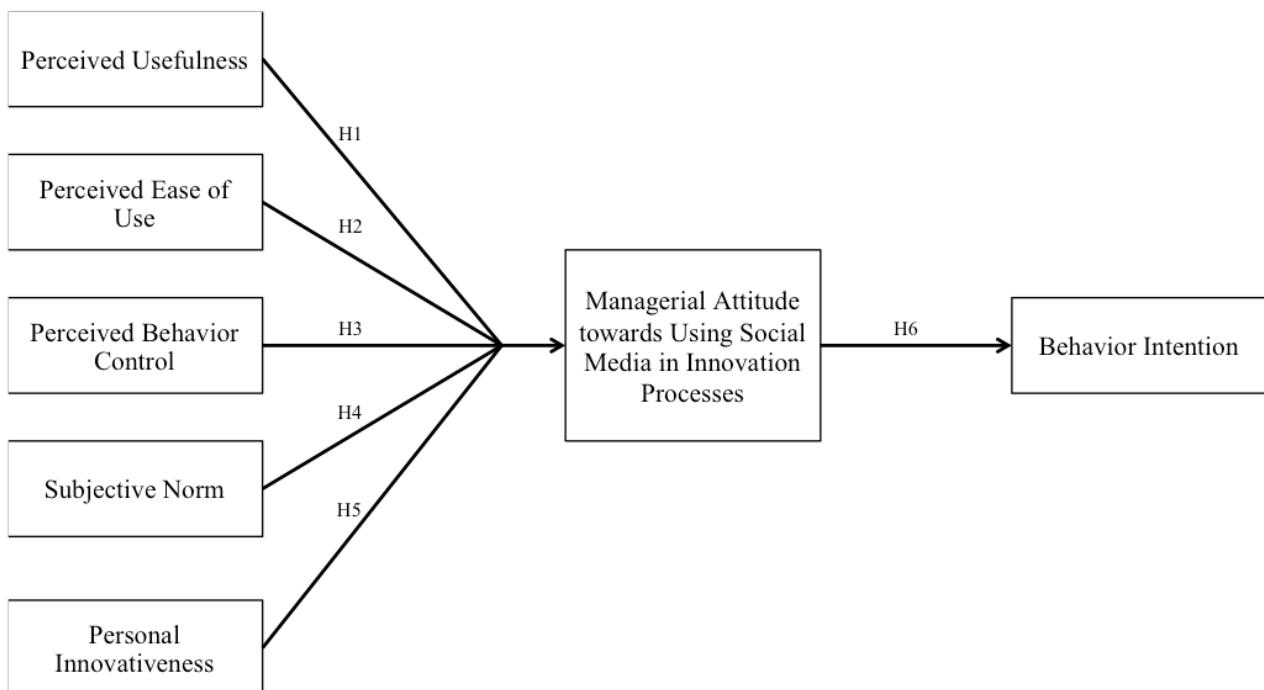


Figure 4: Conceptual Model for this Study

## **4 Methodology**

*The previous chapter presented relevant theories in order to answer the study's purpose. In this chapter, the study's methodology is explained.*

### **4.1 Research Approach and Design**

#### *Inductive vs. deductive research*

According to Bryman (2012), deductive research is the most common one used when it comes to explaining the relationship between theory and research. The author takes knowledge based on theory and creates hypotheses out of the theory (Bryman, 2012; Saunders *et al.*, 2009). Theory that is confirmed or rejected by deductive research is characterized by being a well-founded theory (Bryman, 2012).

In contrast to deductive research, the inductive method is a possible alternative. In this approach, the theory is developed based on the observations and results the researcher has found in his/her study. Inductive research can be seen as an alternative strategy of connecting theory and research (Bryman, 2012; Saunders *et al.*, 2009).

The deductive approach is used because previously developed theories as TAM and TAM2 are employed.

#### *Qualitative vs. quantitative research*

There are two different ways of classifying data: (1.) qualitative and (2.) quantitative (Singh, 2007). Qualitative data is used for exploring an under researched topic by collecting as much data as possible with a focus on in-depth information (Bryman, 2012). By analyzing qualitative data the researcher can create a general understanding or they can illustrate a different viewpoint (Bryman, 2012). However, there are also drawbacks in using a qualitative research approach, as, (1.) qualitative data presents a subjective view, (2.) it is hard to replicate a qualitative study and so doubts regarding the reliability and validity may arise and (3.) it is hard to generalize about these kind of data and lastly, there may be a lack of transparency (Bryman, 2012).

According to Saunders *et al.* (2009), quantitative data can be used for exploring, presenting, describing and examining relationships between different items. The advantage of using this kind of approach is the measurement. Due to the creation of reliable and valid data that can be replicated by other researchers (Bryman, 2012). Another positive effect is that quantitative data can be

generalized more easily (Bryman, 2012). However, this approach also has some problems: (1.) it is necessary that the collection of data is underpinned by precision and accuracy, (2.) in some cases it is hard to connect the results to everyday life and (3.) the data only shows a statistical view on relationships (Bryman, 2012).

Due to the fact that the area of TAM and TAM2 is well researched, the decision was made to use the quantitative approach because the paper aims to explain the relationships of different factors towards the managerial attitude.

## 4.2 Data Sources

When investigating a specific topic, two sources of collecting data exist: (1.) secondary and (2.) primary data.

### *Secondary data*

Secondary data describes data that was collected by other researchers for a similar topic and that is used and analyzed by someone else (Bryman, 2012; Saunders *et al.*, 2009). This way of collecting information is cheaper and less time consuming compared to primary research, provides access to high-quality data and makes longitudinal studies possible (Bryman, 2012). Nevertheless, using secondary data provides some potential for errors, for instance missing key variables due to different purposes or the complexity of data (Bryman, 2012).

### *Primary data*

Primary data is collected when the researcher gathers the information by using for example surveys, in-depth interviews, observations or experiments in order to answer the study's purpose (Bryman, 2012; Saunders *et al.*, 2009). The problem of using this approach is that it is quite time consuming because of the study's preparation and the collection of data in general and the risk of a low response rate that will influence the quality of the data and - in the end - also the conclusions (Bryman, 2012; Saunders *et al.*, 2009). Nevertheless, the researcher can ensure that the key variables are covered and that they are familiar with the research topic (Bryman, 2012).

For this paper the decision was made to collect primary data due to the fact that no empirical information for TAM and TAM2 in the context of managerial attitudes towards social media usage in the innovation process is available. Furthermore the relationship made between (1.) ATT and the different factors as PEU, PU, SN, PBC, PIIT and (2.) ATT on BI will be scrutinized.

### **4.3 Research Strategy**

As written above, the objective of quantitative research is to explain relationships between factors based on hypotheses. By confirming or rejecting hypotheses, the purpose can be reviewed (Singh, 2007). Three different research design approaches exist.

#### *Exploratory*

By using exploratory research, it is implied that the topic is not well researched yet and needs more exploration (Saunders *et al.*, 2009). The exploratory approach allows the researcher to get a more detailed view about the issue (Singh, 2007). According to Saunders *et al.* (2009), three different ways of conducting an exploratory study exist: (1.) reviewing literature, (2.) in-depth interviews with experts within the field and (3.) interviews with focus groups. Furthermore, this research strategy is mainly characterized by a change in view on the research topic because of the collection of new data that allows new insights (Saunders *et al.*, 2009).

#### *Descriptive*

According to Robson (2002), descriptive research is defined as a method “to portray an accurate profile of persons, events or situations” (p. 59). To summarize, the descriptive research strategy can create a snapshot of the situation by answering the questions regarding when, what, where, how and who (Aaker *et al.*, 2010). Due to the fact that there are a lot of studies that deal with social media and the usage of social media in the innovation process, this study does not follow the descriptive approach because previous researchers have painted a clear picture of the situation.

#### *Explanatory*

Explanatory research is the opposite of an exploratory study. By using the explanatory approach the aim is to analyze and to establish causal relationships and links between variables (Saunders *et al.*, 2009). By using statistical numbers like correlations, the collected data is tested to demonstrate causal relationships (Saunders *et al.*, 2009).

This paper follows the explanatory research strategy. Reasons for this decision are for instance the fact that the extended TAM is well researched and the author's objective is to explain the relationships between variables like PIIT, PU, PEU, BI, SN and ATT in the context of using social media in the innovation process. An additional reason is that the study uses an own developed model and to test hypotheses.

#### **4.4 Time Horizon**

Independent of the research strategy, a study could be either cross-sectional or longitudinal (Saunders *et al.*, 2009).

##### *Longitudinal study*

The longitudinal study approach gives a “diary” perspective because it is a method that investigates a phenomenon over a longer period of time and so it provides a series of snapshots that could be analyzed (Saunders *et al.*, 2009). In other words, a longitudinal study highlights changes that happen over time (Bryman and Bell, 2011).

##### *Cross-sectional study*

By choosing a cross-sectional time frame, it is possible to create a snapshot only from one particular situation and it can be used and be helpful in qualitative and quantitative research (Saunders *et al.*, 2009). Due to the fact that all data is collected simultaneously, it is not possible to connect time to the data or the variables and therefore it is not possible to see any change over time (Bryman, 2012). The most important advantage is that a cross-sectional study allows a comparison between the different variables to minimal costs (Bryman, 2012).

The investigation in this paper has been set up as a cross-sectional study, since the time frame of conducting a longitudinal study was not sufficient. In addition, the focus of this study was managers’ current attitudes instead their change over time.

#### **4.5 Data Collection Method**

The data collection method is the technique of gaining data from the sample group – in this case from managers – taking account of answering the study’s purpose (Bryman, 2012). Due to the fact that this paper will conduct a quantitative data collection, three ways of collection exist: (1.) experiments, (2.) observations and (3.) surveys (Bryman, 2012).

By conducting an experiment, the aim is to falsify, verify or validate a hypothesis under the conditions that some variables are changed; and to analyze the effect of the change in other variables (Bryman, 2012). When the purpose of a study is to analyze the behavior of people, the approach of observations can be used. However, this method has disadvantages in terms of that it is highly time consuming, quite expensive and that it is difficult to use for a large population, as in this study’s case (Bryman, 2012). Based on the several problems that arise from using observations, surveys are a valuable alternative in descriptive statistics. For this paper the decision was made to conduct a survey, to distribute it via e-mail and to publish it in social media.

## *Surveys*

The advantages of using surveys are that they make it possible to collect data about the same factors from several respondents as well as facilitating an easy comparison of the results (Miller and Brewer, 2003). Furthermore, surveys are transparent, meaning that researchers are able to replicate a study effortlessly and thus can investigate the data's results and reliability (Miller and Brewer, 2003).

Nevertheless, negative aspects regarding surveys also need to be taken into consideration and problems need to be addressed. First of all, respondents might not understand the survey's questions in the same manner, leading to a problem of the study's validity (Miller and Brewer, 2003). To tackle this issue, this study used a pretest (chapter 4.11.2) in order to ensure that the items of the different concepts have valid measurements. A second aspect is the possible simplification of complicated and delicate research topics (Miller and Brewer, 2003). Due to the fact that a survey is rather simplified and aims at quantitative results, the research area might not be investigated sufficiently (Miller and Brewer, 2003). This study intends to eliminate this problem by making use of items of concepts which have been applied in prior research studies. A third problem concerns the non-response to surveys which is demonstrated by persons who decline to participate or by choosing not to answer certain questions (Miller and Brewer, 2003).

Surveys can either be “supervised” or “self-administrated” (Bourque and Fielder, 1995). The first type requires supervision in a one-to-one situation in which a surveyor can answer a respondent's questions regarding the survey; the latter type obliges the respondent to fill in the questionnaire by him/herself (Bourque and Fielder, 1995). The supervised questionnaire is rarely employed as it involves high costs (Bourque and Fielder, 1995; Bryman, 2012). Due to these reasons, a self-administrated questionnaire is used in this study. Advantages of the self-administrated questionnaire are the stimulus' consistency to all respondents, the possibility to receive answers from a large sample with a wide geographical coverage and a larger sample population (Bourque and Fielder, 1995). In addition, it is faster to administer and is more convenient for the respondents since they can decide when and how to answer to the survey (Bryman, 2012). However, several disadvantages exist which are related to the lack of control over the respondents, or not being able to guide respondents in case of questions (Bourque and Fielder, 1995; Bryman, 2012). The first issue was solved by sending the questionnaire to managers as well as by distributing it via social media networks. The latter disadvantage was addressed by sending an introduction text as well as the e-mail text, which included the author's contact details in case questions would arise. Due to the outweighing of advantages, this method has been employed.

## **4.6 Type of Questionnaire**

Different forms of the self-administrated questionnaire exist; the most common ones are the postal, mail questionnaires and online questionnaires (Bryman, 2012). There are two types of surveys in the online area, namely (1.) e-mail and (2.) web surveys. This research employs web surveys due to several advantages (Bryman, 2012). These surveys can be conducted online, representing a low-cost and effective research tool for collecting information from a large amount of respondents (Miller and Brewer, 2003). As the study is concerned with social media, it has been decided to employ web surveys for the purpose of this study. A web survey is characterized by its distribution via a website to which a respondent is directed (Bryman, 2012). The benefits of the web surveys are the possibility to change its appearance and to directly answer via text boxes, the simple programming, and the option to download the respondents' results automatically via a database (Bryman, 2012). A link to the web survey was included in the mail's and posting's introduction text in order to gather all information in one place.

## **4.7 Survey Content**

Adaptation of a survey's set of questions occurs because of the following factors: (1.) some statements of the original survey might be too long, (2.) a different population from the original survey is studied, (3.) the statements are translated into another language, and (4.) the surveyors have to restructure, enhance or change statements within the questionnaire which differs from the original survey (Bourque and Fielder, 1995). In this study, an adaptation was necessary due to the population under study (managers) and the different purpose of the study.

In order to ensure the reliability of the survey's content, the authors followed Bourque's and Fielder's (1995) instructions. Firstly, an in-depth literature review concerning the factors analyzed in this study was conducted. Secondly, original questionnaires were adapted since these were already developed and tested, enabling a comparison with further studies (Bourque and Fielder, 1995). Thirdly, questions were adapted due to the different sample characteristics (Bourque and Fielder, 1995). Lastly, additional questions were developed which have not been found in prior questionnaires (Bourque and Fielder, 1995).

For a self-administration questionnaire to be effective, a number of factors have to be considered. The questionnaire should be understandable and user-friendly (Bourque and Fielder, 1995; Bryman, 2012). The study's authors placed a high importance on clear and short statements as recommended by Bourque and Fielder (1995) and Bryman (2012). In addition, the order was put into a logical

sequence by presenting all statements in the related category and by placing demographic questions at the end of the survey.

Generally, questions can be either open or closed-ended (Bourque and Fielder, 1995). As noted by Bourque and Fielder (1995), open-ended questions are proven to cause problems in self-administered questionnaires due to the respondents' effort to write or to create their own opinions. Therefore, closed-ended questions were used in this study. Their advantage is that it is possible to compare answers from a large sample by using statistical numbers and that they are easier to process (Bryman and Bell, 2011). All questions are based on previous findings in the literature. The operationalization table shows the connections between the statements and theory. The final questionnaire and an example of the appearance of a posting at the mentioned social media platform can be found in Appendix A.

Table 1: Operationalization Table

Concept	Question	Theory	Measurement
---------	----------	--------	-------------

#### Perceived Usefulness

(PU1)	Social media enable me to accomplish tasks more quickly when searching for innovations.	Cowen (2009)	5-point Likert scale
(PU2)	Social media have improved the quality of innovations within our business.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(PU3)	Social media make it easier to innovate.	Cowen (2009)	5-point Likert scale
(PU4)	Social media have improved the innovation productivity.	Cowen (2009)	5-point Likert scale
(PU5)	Social media give me greater control over innovation processes.	Cowen (2009)	5-point Likert scale
(PU6)	The use of social media increase the effectiveness of performing tasks (e.g. communication with innovators).	Chang (2004), Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(PU7)	Using social media give me access to a lot of information.	Chang (2004)	5-point Likert scale
(PU8)	Social media provide thorough information for my purposes.	Chang (2004)	5-point Likert scale
(PU9)	The advantages of social media in innovation processes outweigh the disadvantages.	Nath <i>et al.</i> (2013)	5-point Likert scale

#### Perceived Ease of Use

(PEU1)	My interaction with social media in innovation processes has been clear and understandable.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(PEU2)	Overall, social media are easy to use.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(PEU3)	Learning to operate with social media was easy for me.	Chang (2004), Cowen (2009)	5-point Likert scale
(PEU4)	The use of social media for innovation does not confuse me.	Cowen (2009)	5-point Likert scale
(PEU5)	Social media are easy to navigate.	Chang (2004)	5-point Likert scale
(PEU6)	Using social media enable me to have more accurate information.	Chang (2004)	5-point Likert scale

### Perceived Behavior Control

(PBC1)	I am able to confidently use social media for innovation processes.	Cowen (2009)	5-point Likert scale
(PBC2)	I have the knowledge to use social media for innovation processes.	Cowen (2009)	5-point Likert scale
(PBC3)	I have the resources to use social media for innovation processes.	Cowen (2009)	5-point Likert scale
(PBC4)	I have control over using social media for innovation processes.	Cowen (2009)	5-point Likert scale

### Subjective Norm

(SN1)	My immediate supervisor thinks I should use social media for innovation processes.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(SN2)	My close friends think I should use social media for innovation processes.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(SN3)	My peers think I should use social media for innovation processes.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(SN4)	My supervisor requires me to use social media for innovation processes.	Cowen (2009), Lu <i>et al.</i> (2005)	5-point Likert scale
(SN5)	Generally speaking, I would use social media for innovation processes without pressure from external social factors	Cowen (2009)	5-point Likert scale
(SN6)	People around me who use social media for innovation processes have more prestige than those who do not.	Lu <i>et al.</i> (2005)	5-point Likert scale
(SN7)	Using social media for innovation processes is considered a status symbol among my friends.	Lu <i>et al.</i> (2005)	5-point Likert scale

### Behavior Intention

(BI1)	I intend to continue using social media for innovation processes to perform my job.	Cowen (2009)	5-point Likert scale
(BI2)	I intend to frequently use social media for innovation processes to perform my job.	Cowen (2009)	5-point Likert scale
(BI3)	Assuming I have access to social media for innovation processes, I intend to adopt it.	Lu <i>et al.</i> (2005)	5-point Likert scale
(BI4)	Given that I have access to social media for innovation processes, I predict that I would adopt it.	Lu <i>et al.</i> (2005)	5-point Likert scale

### Personal Innovativeness

(PIIT1)	If I heard about a new information technology, I would look for ways to experiment with it.	Lu <i>et al.</i> (2005)	5-point Likert scale
(PIIT2)	Among my peers, I am usually the first to explore new information technologies.	Lu <i>et al.</i> (2005)	5-point Likert scale
(PIIT3)	I like to experiment with new information technologies.	Lu <i>et al.</i> (2005)	5-point Likert scale
(PIIT4)	In general, I do not hesitate to try out new information technologies.	Lu <i>et al.</i> (2005)	5-point Likert scale

### Attitude Towards Using

(ATT1)	I think positively about using social media for innovation processes.	Chang (2004)	5-point Likert scale
(ATT2)	Social media are a positive tool for innovation processes for our company.	Chang (2004)	5-point Likert scale
(ATT3)	Using social media for innovation processes is a wise idea.	Chang (2004)	5-point Likert scale
(ATT4)	Social media are worth to use within the innovation process.	Chang (2004)	5-point Likert scale
(ATT5)	I plan on using social media for innovation processes on a regular basis in the future.	Chang (2004)	5-point Likert scale

(ATT6)	Using social media within the innovation process is pleasant.	Chang (2004)	5-point Likert scale
--------	---	--------------	----------------------

#### Actual Use

(ACTUAL)	How many times do you use social media for innovation during a day?	Chang (2004)	5-point Likert scale
(ACTUAL)	How many times do you use social media for innovation during a week?	Chang (2004)	5-point Likert scale

#### Demographic Data

Demographic	Please state your gender.	To establish a link between the research area and the respondent	A closed-ended question, personal factual question about the respondents' gender
Demographic	Please state your age (in years).	To establish a link between the research area and the respondent	A closed-ended question, personal factual question about the respondents' age
Demographic	Please state the location of your company's headquarter. (Country is sufficient)	To establish a link between the research area and the respondent	An open-ended question about the location of the company's headquarter
Contact details	Please state your company's name and/or your e-mail address in case you want to receive the results of this study.	To establish a link between the research area and the respondent	An open-ended question about the contact details
Demographic	Please state your function within the company	To establish a link between the research area and the respondent	An open-ended question about the respondent's job function

## 4.8 Sampling

### *Population*

The sample that is selected within a population (Bryman, 2012) consisted of managers from various industries, operating from different countries. Bryman (2012) defines a sample as “the segment of the population that is selected for investigation” (p.187). After the population has been defined, the decision is made to include all people (“consensus”) or to focus on representatives of the chosen people (“sample”) (McGivern, 2009).

### *Sampling frame*

The sampling frame is “the listing of all units in the population from which the sample will be selected” (Bryman, 2012; p.187). These criteria were: (1.) managers from various industries and (2.) different countries. Due to the study’s focus on managerial attitudes towards social media integration into innovation processes, the selected sample was found in web forums in order to reach managers who make use of social media. (3.) it can be assumed that not all managers within these forums are active members who participate regularly in conversations. Consequently, it is challenging to state the actual sampling frame’s number.

### *Sampling method*

As stated before, web surveys were used for data collection. In order to receive contact details for the e-mail survey, an extensive research on company lists was conducted. By making use of the

search engine Google<sup>1</sup>, it was possible to get company lists from a variety of sources was on managers working in “innovative” companies which were found on the Internet<sup>2</sup>.

Web surveys were distributed within two professional job platforms. The first platform chosen was LinkedIn<sup>3</sup> which operates on an international level (LinkedIn, 2014); the second platform chosen was Xing<sup>4</sup>, the biggest job platform for the German speaking Europe (Xing AG, 2014). To be more specific, the authors of this study decided to join forums focusing on innovations in order to acquire a sample of managers interested in innovations. To ensure that only managers who fulfill the study's requirements participated in the questionnaire, the questionnaire asked for their function within the company. Additionally, the introduction text stated that the study needed the managers' point of view. In LinkedIn it was possible to see the job level, so the authors of the study can ensure that the questionnaire was distributed to the desired target group. In appendix D, two examples are provided that show these group statistics. The list of joined groups can be found in Appendix B. The groups were selected based on the large amount of members and conversation activities.

#### *Sampling technique*

Two sampling techniques can be used, either (1.) a probability or (2.) a non-probability sample (Bryman, 2012). A probability sample is defined as “a sample that has been selected using random selection so that each unit in the population has a known chance of being selected” (Bryman, 2012 p.187).

For the purpose of this research, a non-probability sampling technique was carried out. The most common non-probability sampling strategies are (1.) the snowball sampling, (2.) the quota sampling technique and (3.) the convenience sample (Bryman, 2012). When employing the “snowball sampling” strategy, the researchers contact a group of people, who are related to the research topic being investigated, and then the contacts of that group (Bryman, 2012).

The quota sampling's goal is to sample in a such a way as to achieve a population that represents a population based on the proportions of persons within various categories (“quotas”) like age groups, gender or residence region as well as the mixture within the categories (Bryman, 2012).

---

<sup>1</sup> google.com

<sup>2</sup> top100innovators.com, forbes.com/innovative-companies, sweden.se/10-world-shaping-swedish-companies

<sup>3</sup> linkedin.com

<sup>4</sup> xing.de

The last technique is called convenience sample and is characterized as a sample that is “simply available to the researcher by virtue of its accessibility” (Bryman, 2012, p. 201). As highlighted by Bryman (2012), a convenience sample is common within organizational studies and used more often than a probability sample. Nevertheless, it has disadvantages, as the results are not generalizable due to the lack of knowledge as to whether the sample is representative (Bryman, 2012). Due to access reasons and its common use, the convenience sample was selected in this study.

### *Sampling issues*

There are several sampling issues when employing online surveys (Bryman, 2012). These can be briefly summarized as follows: (1.) Persons have often more than one e-mail address, (2.) more than one Internet provider, and (3.) Internet users can create a sampling bias since they do not represent the whole population (Bryman, 2012). Bryman (2012) refers to Hewson and Laurent (2008) stating that non-existing sample frames can be handled by creating a suitable sample. This can be done by posting invitations of the questionnaire into relevant forums or on websites to reach a sample of relevant persons (Hewson and Laurent, 2008). Moreover, it is always challenging to get the direct contact details of managers.

### *Response rate*

As aforementioned, the survey was distributed via e-mail and by posting into online communities. The total response rate of the study's survey was 146 respondents. Nine answers had to be removed, as the surveys have not been completed, leading to 137 valid answers. 600 e-mails with the link to the questionnaire were sent out as well as posting into online communities were done between 25<sup>th</sup> April 2014 and 9<sup>th</sup> May 2014. The surveys distributed via e-mail generated eight responses, corresponding to a response rate of 1.2%. The response rates were increased by employing techniques like targeting a special kind of sample, follow-up e-mails and follow-up postings (Bourque and Fielder, 1995).

## **4.9 Missing Data**

Saunders *et al.* (2009) recommend encoding missing data using a particular data code, even if no data was gathered for a certain concept. In this study, the authors encoded missing data by using the code (“.”) in order to perform the statistical analysis. In addition, it is vital that the data is entered correctly (Saunders *et al.*, 2009) which was done by checking the data file several times for incorrect or missing numbers. This check was done using one method presented by Saunders *et al.*

(2009). It is essential that all relationships within the data are logical (Saunders *et al.*, 2009). Thus, the study's authors checked all the data for illogical relationships.

#### **4.10 Data Analysis Method**

Due to the study's quantitative nature, a statistical analysis was conducted for examining the data gathered. The statistical analysis was carried out in the program SPSS Statistics 21. For analyzing the data, the respondents' statements were transposed into numbers. A 5-point Likert scale was applied with a range of 1= Strongly Disagree, 2= Disagree, 3= Partly/partly, 4= Agree, to 5= Strongly Agree. As a result, the numbers used in the analysis reached from 1 to 5. In this study, the following data analysis methods were used: (1.) Frequencies, (2.) descriptive statistics, (3.) Cronbach alpha's reliability test, (4.) Pearson's correlation, (5.) exploratory data analysis (6.) and hierarchical linear regressions.

#### Variables

##### *Independent and dependent variables*

For the purpose of this research, the research model (chapter 3) was split into two models. The first model contained the following independent variables: perceived usefulness (PU), perceived ease of use (PEU), perceived behavior control (PBC), subjective norm (SN) and personal innovativeness (PIIT). For the first model, the dependent variable was attitude towards using (ATT). The second model consisted of the independent variable attitude towards using (ATT) and the dependent variable behavior intention (BI).

##### *Background variables*

The following background variables were measured: Frequency of use of social media for innovation (1.) during a day and (2.) during a week. Further demographical data was collected on the location of the company's headquarters, and the company's name.

##### *Control Variable*

Due to the fact that not all variables can be studied simultaneously, some must be investigated to ensure that they do not have an impact on the relationship of the independent as well as on the dependent variable (Singh, 2007). The variables which must be further examined and which might have an moderating effect, are the control variables (Singh, 2007). In this study's case, the control variables are age and gender.

## **4.11 Quality Criteria**

A study needs to fulfill two important criteria in order to ensure the quality, namely (1.) reliability and (2.) validity (Bryman, 2012; Singh, 2007).

### **4.11.1 Reliability**

Reliability is related to the measures' consistency of a concept (Bryman, 2012). It consists of three factors that need to be taken into account: (1.) stability, (2.) internal reliability and (3.) inter-observer consistency (Bryman, 2012).

Stability evaluates how stable a measurement is over a certain amount of time in order to guarantee that the results concerning to this measure do not vary (Bryman, 2012). For this research, stability was achieved by giving reasons on how to conduct this study and presenting its different steps, so the study is repeatable for other researchers.

Internal reliability investigates if the factors of the index or scale are consistent, meaning that the “respondents’ scores on any one indicator tend to be related to their scores on the other indicators” (Bryman, 2012, p.169). It is possible to analyze reliability by evaluating the internal consistency of the items used in the survey (Singh, 2007). The software SPSS makes it possible to conduct an internal reliability test (Singh, 2007) like Cronbach's alpha, thus this test was applied to this study. Cronbach's alpha coefficient varies between 1 (representing the best possible internal reliability) and 0 (representing no internal reliability at all) (Bryman, 2012), with the number 0.70 as a satisfactory indicator of internal reliability (Bryman, 2012). The study’s hypotheses were tested by carrying out reliability tests for the concepts which were incorporated in the hypotheses. For each of the seven concepts, at least two statements were made. As a reliability test, Cronbach's alpha was calculated for measuring the internal reliability of the seven concepts PU, PEU, PBC, SN, PIIT, ATT and BI. All concepts were found to be internal reliable (chapter 5, table 4).

If it is expected that there is a causal relationship between two variables, a regression analysis is carried out (Miller and Brewer, 2003). In order to test the hypotheses, two hierarchical linear regression tests were conducted by using control variables. The regression analysis shows the  $R^2$  values, the regression coefficient b-value and the relationship's significance of the dependent and independent variable (Saunders *et al.*, 2009). The  $R^2$  explains how well the model fits the data and explains how well the model clarifies the variability of data (Saunders *et al.*, 2009). If the  $R^2$  is close to 1, the model explains the data perfectly; if the  $R^2$  is close to 0, it is likely that the data has occurred by chance (Saunders *et al.*, 2009). If the b-value follows a positive sign, the relationship is

positive; if the b-value follows a negative sign, the relationship is negative (Miller and Brewer, 2003). A significance value that is smaller than 0.05 indicates that the coefficient did not happen by coincidence, while a value over 0.05 shows that the coefficient did happen by coincidence (Saunders *et al.*, 2009). In this study, it was expected that PU, PEU, PBC, SN and PIIT have a relationship with ATT. Thus, the first linear regression checked the aforementioned variables that formed the first research model. The second model examined the relationship between the independent variable ATT on the dependent variable BI, and was implemented in the second linear regression.

Inter-observer consistency is related to the consistency of the observer's decisions in case there is more than one observer (Bryman, 2012, p.169). In this study, inter-observer consistency was achieved by a continuous information exchange and daily discussions about each author's progress.

#### **4.11.2 Validity**

Validity is described as "whether an indicator (or set of indicators) that is devised to gauge a concept really measures that concept" (Bryman, 2012, p. 171). Furthermore, external and internal validity must be taken into consideration (Singh, 2007). External validity is the extent to which the study can be applied and thus generalized to different situations (Singh, 2007). Internal validity concerns the thoroughness of how the study was conducted (Singh, 2007) and can be measured by the following constructs: (1.) concurrent validity, (2.) predictive validity, (3.) construct validity, (4.) convergent validity and (5.) face validity (Bryman, 2012).

In order to ensure (1.) concurrent validity, all items measuring the different concepts relate to managers who either employ social media in innovation processes or who do not apply social media in innovation processes. (2.) Predictive validity was ensured by theorizing that also in the future managers employing social media in innovation processes, should possess a higher amount of PU, PEU, PBC, SN, BI and PIIT. This is similar to establishing concurrent validity, with a difference that the emphasis is on the future, instead of the presence. This study employed several correlation tests on each concept measured since every concept contained more than one item for ensuring (3.) construct validity. The results of the correlation test revealed that all seven concepts (PU, PEU, PBC, SN, PIIT, ATT and BI) were valid. In addition, the concepts and items employed in this study were selected based on prior research from several sources in order to guarantee (4.) convergent validity. (5.) Face validity was achieved by obtaining feedback from a range of sources, including a seminar group, other teachers, the tutor and from the examiner. Furthermore, the questionnaire went through a pretest of four external persons with an academic background and one professional who

works with innovation in her job. Hence, the study's content and the questionnaire were evaluated on several occasions in order to ensure the face validity.

#### 4.12 Overview of Research Process

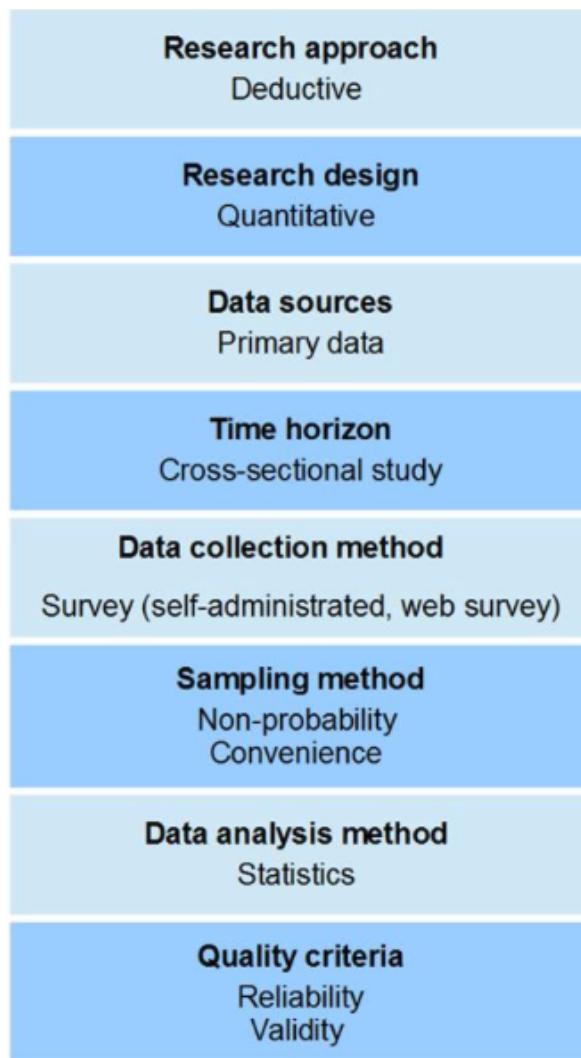


Figure 5: Overview of Research Process

## 5 Results and Analysis

By carrying out the methodology decisions, this chapter presents the empirical findings and conducts an analysis, illustrated in several graphics and tables. The chapter starts with information about demographics, followed by tests of reliability and correlation. The chapter ends with the presentation of the results based on hierarchical linear regression that is used for testing the hypotheses.

### 5.1 Results

#### 5.1.1 Descriptive Data

In order to analyze the demographical data of this study, frequency tables were set up via the software program SPSS. In the following paragraph, an analysis of the study's demographic data is presented.

*Gender*

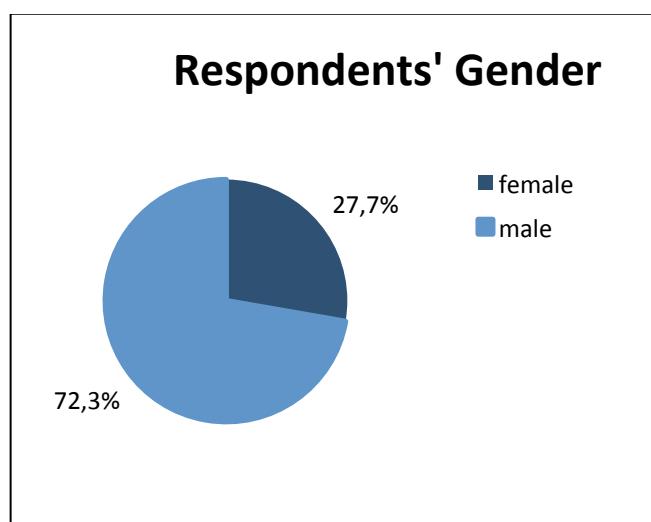


Figure 6: Distribution of Gender

In order to assess the proportion of male and female respondents, the frequency of each gender was calculated (figure 6). The frequency reveals that the majority of respondents is male (72%), while the minority of respondents is female (28%).

### *Respondents' age*

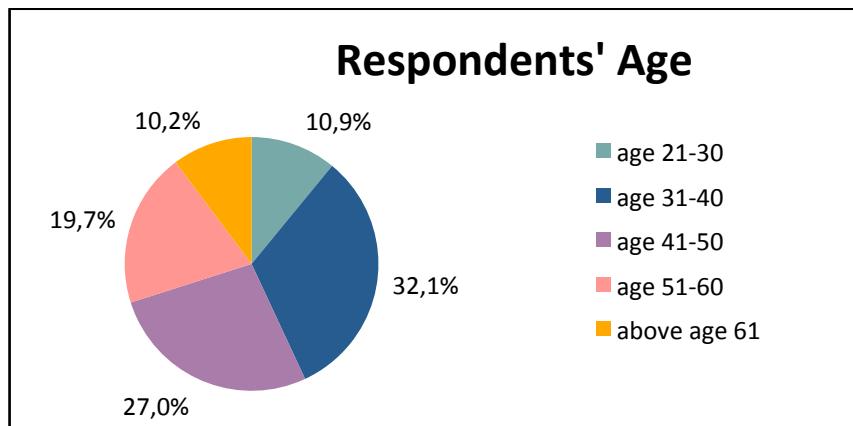


Figure 7: Age Groups

Figure 7 presents the respondent's age within different age categories. The majority of respondents is between 31 to 40 years old (32.1%), followed by 41 to 50 (27%), 51 to 60 (19.7%), 21 to 30 (10.9%) and above 61 (10.2%).

The following conclusions can be drawn from these results. First of all, the majority of the managers who participated in the study are between 31 to 40 years old. Secondly, it can be assumed that in general, most managers are between 31 to 50 years old who were interested in this research area, indicated by their participation in the survey. Thirdly, it can be supposed that there is a lack of young managers and older than 61 years in general, as shown by the small amount of respondents of the age 21 to 30 years and above 61 years old.

### *Respondents' function within the company*

Table 2: Overview of the Respondents' Function within the Company

Respondents' function within the company
Branch Manager
Business Manager
CEO
Chief Marketing Office
Client Relationship Manager
Communication Manager
Customer Support Manager
Director
General Manager
Group Management

Head of Innovation Management
Manager
Managing Director
Marketing Manager
Product Manager
Research Manager
Senior Executive Manager
Senior Innovation Officer
Senior Manager Community Programs
Senior Project Manager
Team Manager

The respondents participating in the survey have a variety of professions as can be seen in table 2. For example, general managers, product managers as well as communication managers joined the study. Consequently, a broad range of managerial points of views related to the use of social media in innovation process is gained. Thus, the requirement to investigate high-level managers is fulfilled and it is proven that managers are reached.

#### *Location of Headquarter*

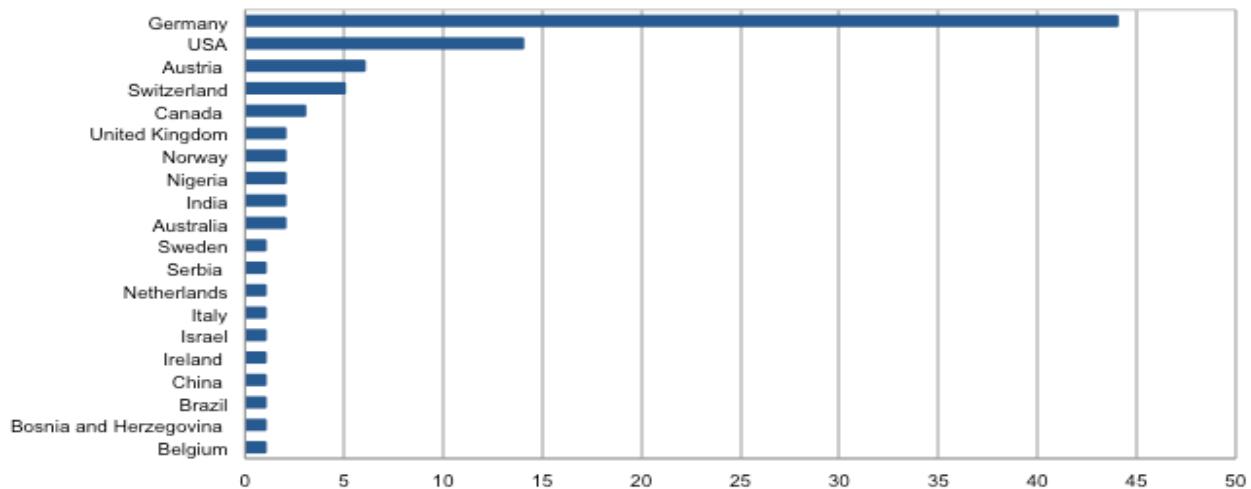


Figure 8: Location of Headquarter

The majority of managers participating in the questionnaire are from Germany (44 participants), followed by USA (14), Switzerland (5), Austria (6) and Canada (3). Australia, India, Nigeria, Norway and the United Kingdom have two participants each. Managers from Belgium, Bosnia and

Herzegovina, Brazil, China, Ireland, Israel, Italy, the Netherlands, Serbia and Sweden also participate in the study with one participant per country.

*Actual use of social media for innovation processes per day*

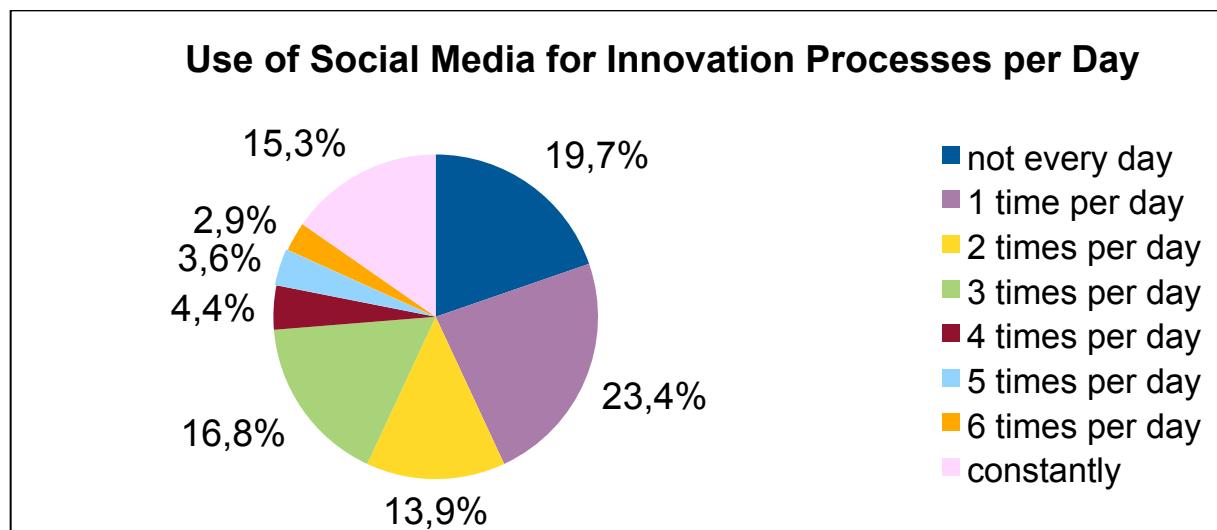


Figure 9: Use of Social Media for Innovation Processes per Day

Figure 9 shows that most respondents use social media for innovation processes once a day (23.4%), while the next largest group does not use it every day (19.7%). This is followed by three times per day (16.8%), constantly (15.3%), two times per day (13.9%), four times (4.4%), five times (3.6%) and six times (2.9%) per day.

It is noticeable that almost 20% of respondents answer that they never use social media for innovation processes every day. Most respondents indicate that they use social media once a day which is followed by respondents who state that they constantly use social media for innovation processes throughout the day.

### *Actual use of social media in innovation processes per week*

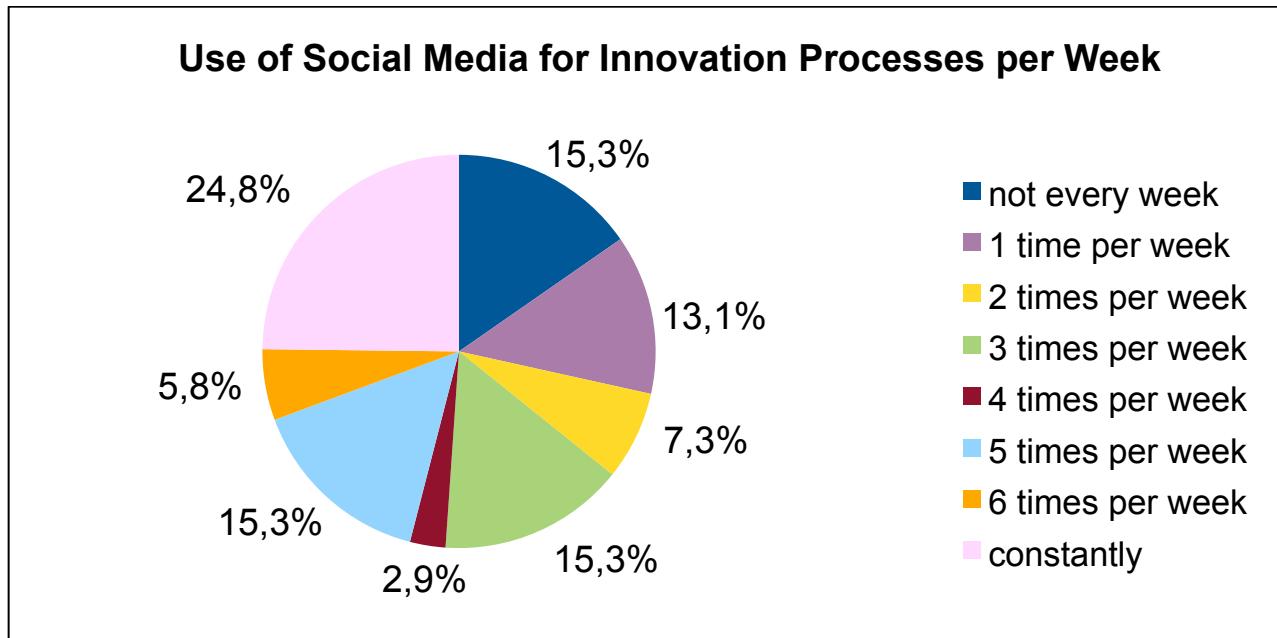


Figure 10: Use of Social Media for Innovation Processes per Week

The use of social media for innovation processes per week is presented in figure 10. The majority (24.8%) of respondents answer that they constantly use social media for innovation processes throughout the week. Three answers yield the same amount of answers (15.3%), namely never, three times and five times per week. This is followed by the respondents who indicate that they use social media for innovation processes one time (13.1%), two times (7.3%), six times (5.8%) and four times per week (2.9%).

The results imply that most respondents use social media for innovation processes constantly throughout the week. It is remarkable that three items receive the same amount of answers, showing that respondents either never use social media or they use it three or five times per week. Consequently, the use of social media for innovation processes per weeks are relatively mixed, except the fact that most respondents use it constantly per week.

#### **5.1.2 Descriptive Statistics**

##### *Boxplots*

Before the deep analysis of the collected data can start, the “boxplots” function - using quantiles and outliers – was used to see whether some questions might cause problems in the analysis.

The median is indicated in the box plot by the black bar in the middle of the colored box (Saunders *et al.*, 2009). The lower limits of the box represents the first quartile and the upper limits the third

quartile (Saunders *et al.*, 2009). The “whiskers” go up and down to the maximum box from the lowest to the highest answered value, but they have a maximum length of 1.5 times of the quantile interval (means maximal 1.5 times the whole box). All values outside this range are defined as outliers and are shown separately (Saunders *et al.*, 2009).

Arithmetic means are very sensitive to outliers. Existing outliers can be recognized by the fact that the median (more robust against the influence of outliers) strongly differs from the mean (Saunders *et al.*, 2009). Another important and useful statistical number for illustration of the variable and their distribution is the measure of dispersion. The most common measure of dispersion is the standard deviation, which is also sensitive to outliers (Saunders *et al.*, 2009).

Due to the fact that in the analysis the mean and the standard deviation are used, the decision was made to exclude the following questions in order to produce a stronger result in the correlation and in the linear regression.

- Social media enable me to accomplish tasks more quickly when searching for innovations. (PU1)
- Social media give me greater control over innovation processes. (PU5)
- Overall, social media are easy to use. (PEU2)
- The use of social media for innovation does not confuse me. (PEU4)
- I have the resources to use social media for innovation processes. (PBC 3)
- I have control over using social media for innovation processes. (PBC 4)
- Generally speaking, I would use social media for innovation processes without pressure from external social factors. (SN5)
- Social media are a positive tool for innovation processes for our company. (ATT2)
- Using social media for innovation processes is a wise idea. (ATT3)
- Social media are worth to use within the innovation process. (ATT4)
- Using social media within the innovation process is pleasant. (ATT6)

A figure that presents the boxplots can be found in Appendix E.

### *Standard deviation and other descriptive statistics*

Table 3: Descriptive statistics and Pearson correlation coefficients

Variables	Minimum	Maximum	Mean	SD	1	2	3	4	5	6
1. Perceived Usefulness	1.00	5.00	3.2906	0.95416	1					
2. Perceived Ease of Use	1.00	5.00	3.4045	0.80811	0.601**	1				
3. Perceived Behavior Control	1.00	5.00	3.2628	1.00565	0.600**	0.602**	1			
4. Subjective Norm	1.00	5.00	2.8557	1.01754	0.691**	0.435**	0.484**	1		
5. Personal Innovativeness	1.00	5.00	3.6478	0.94205	0.271**	0.414**	0.357**	0.290**	1	
6. Attitude towards Using	1.00	5.00	3.4818	1.17950	0.795**	0.552**	0.565**	0.734**	0.296**	1
7. Behavior Intention	1.00	5.00	3.4690	1.09580	0.769**	0.529**	0.587**	0.704**	0.293**	0.839**

Notes: n=137; \*\*p < 0.01 (two-tailed)

Table 3 shows that all seven concepts yield 137 valid responses (N=137). PU receives a mean of 3.2906 and a standard deviation of 0.95416. The second concept, PEU gains a mean of 3.4045 and a standard deviation of 0.80811. PBC gets a mean of 3.2628, with a standard deviation of 1.00565. The fourth concept, SN receives a mean of 2.8557 and a standard deviation of 1.01754. PIIT obtains a mean of 3.6478, while the standard deviation was 0.94205. The mean of the concept ATT is 3.4818, with a standard deviation of 1.17950. The last concept, BI, achieves a mean of 3.4690, with a standard deviation of 1.09580.

As can be seen from these results, the concept SN has the lowest mean which points out that most respondents are undecided regarding the use of social media for innovation processes in relation to subjective norms. The highest mean is found for PIIT, revealing that most respondents considered themselves as being innovative. The highest standard deviation exists for ATT, which means that the respondents differed in their answers to a larger extent than from all other concepts. The smallest differences in answers exist for the PEU for social media, displaying that most respondents perceived PEU in a similar way.

### *Quality Criteria*

In the following, the highest and lowest numbers are summarized from the correlation tables of the single items that measured the seven concepts. The correlations are an indicator for validity. The highest Pearson's r is found between the items BI1 and BI2 (0.849), between BI2 and ATT5 (0.811), SN2 and SN3 (0.803) and between BI1 and BI3 (0.801). The lowest person's r is found to be between the items PEU3 and SN7 (-0.095), SN2 (-0.003), and SN4 (-0.023). These results demonstrate that there is almost no relationship between these variables. The highest Sig (2-tailed)

value exists between the items PEU3 and SN2 (0.976), PU3 and PIIT2 (0.818), PEU3 and SN4 (0.796), which means that there is no statistically significant correlation. The lowest Sig (2-tailed) value is 0 and can be found between numerous items within this study, indicating that they are statistically significant. The detailed overview of the correlations between the single items of the seven measured concepts can be found in table Appendix C.

### 5.1.3 Reliability

Table 4: Overview of Cronbach's alpha

Concept	Cronbach's alpha	Number of items
Perceived Usefulness (PU)	0.907	7
Perceived Ease of Use (PEU)	0.684	4
Perceived Behavior Control (PBC)	0.735	2
Subjective Norm (SN)	0.885	6
Personal Innovativeness (PIIT)	0.861	4
Attitude towards using (ATT)	0.854	2
Behavior Intention (BI)	0.919	4

In order to measure the concept's internal reliability, Cronbach's alpha is calculated. As stated in chapter 4, a value of at least 0.70 is seen as a satisfactory indicator of internal consistency. Table 4 presents Cronbach's alpha for the seven concepts measured. BI receives the highest internal consistency (0.919), followed by PU (0.907), PIIT (0.861), ATT (0.854) and PBC (0.735). Though the concept PEU (0.684) obtains the lowest Cronbach's alpha, its internal reliability is still adequate. According to Malhotra (2010), 0.6 is defined as the cut-off for Cronbach's alpha.

### 5.1.4 Validity

It is important to take a closer look at the correlation between the different items. Correlations show the dependence between two variables (Bortz, 2005). In other words, the correlation makes it possible to examine if variable x influences variable y. Measurements which have values larger than 0.9 create the problem of multicollinearity, thus it needs to be ensured that all items have a value that is below 0.9 (Katz, 2011). In the study at hand, all values are below 0.9 and therefore the different items do not have multicollinearity.

As can be seen in table 4, strong, positive correlations between the different variables exist. High correlations can be seen between the variables ATT and the BI to use social media in the innovation

process ( $r = 0.839$ ) and between BI and PU ( $r = 0.769$ ). The variable PIIT has a weak linear relationship towards all the other variables ( $r = \text{between } 0.2 \text{ and } 0.4$ ). This result is surprising because when creating the questionnaire it was assumed that PIIT would have a much stronger influence on the other items. The numbers in table 5 demonstrate a high construct validity.

Nevertheless, all numbers of  $r$  show a positive, linear relationship towards each other and the study expresses a high validity.

### 5.1.5 Hierarchical linear Regression

Table 5 presents the Beta values and the standard errors (in brackets) of the regressions models together with their significance level.

Table 5: Ordinary Least Squares Regression

Variables	Model 1.1	Model 1.2	Model 2.1	Model 2.2
<b>Control variables</b>				
<b>Gender</b>	-0.058 (0.227)	0.046 (0.130)	0.065 (0.213)	0.114** (0.114)
<b>Age</b>	-0.158* (0.088)	-0.081* (0.049)	-0.104 (0.082)	0.030 (0.044)
<b>Independent variable</b>				
<b>PU</b>		0.456**** (0.095)	-	-
<b>PEU</b>		0.084 (0.097)	-	-
<b>PBC</b>		0.064 (0.077)		
<b>SN</b>		0.350**** (0.077)	-	-
<b>PIIT</b>		0.012 (0.067)	-	-
<b>ATT</b>	-	-		0.854**** (0.043)
<b>R<sup>2</sup></b>	0.031	0.715	0.013	0.719
<b>Adjusted R<sup>2</sup></b>	0.017	0.699	-0.002	0.713
<b>Change in R<sup>2</sup></b>	0.031	0.683****	0.013	0.707****

**Notes:** n=137; \* $p < 0.10$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ ; \*\*\*\* $p < 0.001$  “-“ means that this independent variable was not part in the model

The former steps were important as preparation for the hierarchical linear regression. The aforementioned results have shown that there are linear relationships between the different items. In the hierarchical linear regression one dependent variable and one or more independent variables exist, which cause causal relationships. In this study, two hierarchical linear regressions were conducted. The first model consists of the factors PU, PEU, PBC, PIIT and SN regarding ATT. The second model examines the influence of ATT on BI. In regression model 1, model 1.1 investigates only on the influence of the control variables age and gender. In model 1.2 the independent variables PU, PEU, PBC, SN and PIIT are included. Same for regression model 2; it consists of model 2.1 where again only the control variables are taken into account, and model 2.2 where the influence of ATT is examined.

Additionally to the dependent and independent variable that are part of model 1 and 2, the linear regression also has to take the influence of control variables into account. A control variable is defined as a variable that is not covered in the study's purpose but which could probably affect the relationship between dependent and independent variables. In the study at hand, the hierarchical linear regression includes the factors age and gender to ensure that the results are not representing a distorted image.

To check if the regression could explain the research model, the two quality measurements (1.) the coefficient of determination  $R^2$  and (2.) the F-statistic have to be calculated.

In model 1.1, the control variables age and gender can explain only 3.1% ( $R^2 = 0.031$ ) of the variance of the dependent variable ATT. When including the items PU, PEU, SN, PBC and PIIT the variance increases to a  $R^2$  of 71.5%. The  $R^2$  change shows a tremendous and highly significant ( $p < 0.001$ ) change from a  $R^2$  change value in Model 1.1 of 0.031 to a value of 0.683 in Model 1.2. These results mean that the control variables age and gender do not have an impact on ATT and that the main predictors on ATT are the items PU, PBC, PEU, SN and PIIT. This statement is also supported by the significance level of the control variables of  $p = 0.118$ . Age and gender do not significantly influence the relationship of how PU, PEU, SN, SPBC and PIIT affect ATT. Nevertheless, when looking at Model 1.2, the significance is here  $p = 0.000$ . This states that the factors PU, PEU, SN, PBC and PIIT influence ATT. For model 1.1, SPSS gives a low F- statistic number of 2.172 and for model 1.2 of 46.12. Due to the fact that the p-value of model 1.2 is below 0.05, it seems that there is a statistical correlation between the independent ATT and dependent variables.

For regression model 2, the control variables in model 2.1 explain 1.3% ( $R^2= 0.013$ ) of variance and the independent variable ATT increases to  $R^2=0.719$ , means 71.9% of the variance in the model are explained by ATT. In addition, the  $R^2$  change between model 2.1 and 2.2 is again tremendously high. The change in  $R^2$  from model 2.1 to 2.2 has the value of 0.70 and is highly significant ( $p<0.001$ ). This result shows that there is a high effect, so model 2.2 shows that ATT has an impact on BI and the result can be supported by the collected data. Furthermore, model 2.1 is not significant on a level of  $p= 0.427$ . For model 2.2, which investigated on the relationship between ATT and BI, the significance level is  $p= 0.000$ . The F-statistic numbers also support the statement that age and gender have no impact on the purpose of if ATT has an relationship to BI. The F-statistic number for model 2.1 is 0.857. The F for model 2.2 is quite high with a value of 335.119.

Summarized, the hierarchical linear regression on the different items and the control variables discloses that age and gender have no influence on the results concerning the relationship(s) between independent and depended variables. This statement is supported by the significant  $R^2$  change in both models, which means that the model is valid and can be used as the main regression model. In addition, the results of the regression uncover those linear relationships between (1.) PU, PEU, SN, PBC and PIIT to ATT and (2.) ATT to BI.

## 5.2 Testing of Hypotheses

By using the method of hierarchical linear regression, it is possible to see which hypotheses can be accepted and which have to be rejected. In Table 6, all hypotheses are presented. In addition, Beta and the significance level are stated because they justify the decision if a hypothesis is accepted or rejected.

Table 6: Testing of Hypotheses

Hypothesis	Description	Beta	Significance	Accepted/Rejected
<b>H1 (PU)</b>	The manager's perceived usefulness of social media influences the attitude towards using them in innovation processes.	0.456	0.000	Accepted
<b>H2 (PEU)</b>	The manager's perceived ease of use of social media influences the attitude towards using them in innovation processes.	0.084	0.209	Rejected
<b>H3 (PBC)</b>	The manager's perceived behavior control influences the attitude towards using social media in innovation processes.	0.064	0.330	Rejected
<b>H4 (SN)</b>	Peers or senior leaders influence the subjective norm of managers concerning their attitude towards using social media in innovation processes.	0.350	0.000	Accepted
<b>H5 (PIIT)</b>	The managerial personal innovativeness influences the attitude towards social media in innovation processes.	0.012	0.829	Rejected
<b>H6 (ATT)</b>	The attitude towards using social media in innovation processes influences the managerial BI.	0.854	0.000	Accepted

Three of the six hypotheses – H1, H4 and H6 – can be accepted by using the hierachal linear regression. H1 tested the influence of PU on ATT. H4 investigates the relationship between SN and ATT. H6 measures the influence of ATT on BI. Due to the fact that all significance levels have the value of  $p= 0.000$ , it shows that there is a high influence between (1.) the items and ATT and (2.) ATT and BI. The high beta values (standardized coefficients) of  $\text{beta}_{\text{PU}}= 0.456$ ,  $\text{beta}_{\text{SN}}= 0.350$  and  $\text{beta}_{\text{ATT}}= 0.854$  support the results that are done by interpreting the significance  $p$ . Thus, all hypotheses with a significance value over  $p= 0.05$  have to be rejected. Consequently, for model 1,

the items PEU, PBC and PIIT are not influencing the attitude towards using social media in the innovation process.

In model 2 only one independent factor is examined. The result of the linear regression shows a significance of  $p= 0.000$ . This means that ATT has high influence on the BI.

## **6 Discussion**

*The discussion chapter illustrates critically the results of the empirical data in connection to the reviewed literature. It presents an enhanced investigation on the acceptance or rejection of the hypotheses.*

The purpose of this study was to explain the managerial attitudes towards social media as a tool for generating innovations. 137 companies from all around the world have participated in this study. This high number of respondents causes empirical evidence.

In previous studies a lot of research concerning TAM and social media can be found. Nevertheless, this investigation had another focus compared to prior research and therefore the results are new and often not conform to the already existing theory in the field of technology acceptance, social media and innovation.

### Perceived Usefulness (PU)

The first hypothesis was based on the theory of PU and the belief that technology enhances an individual's performance (Liu *et al.*, 2010). Verkasalo *et al.* (2010) have shown that contrary results exist when it comes to the effect which PU has on a person's usage behavior of a new technology system. Due to this inconsistency of results PU was connected to this study by investigating the influence of PU on the managerial use of social media in innovation processes. Based on the statistical numbers p and beta this hypothesis is accepted. Therefore, the results show that PU influences the manager's attitude on using social media for being innovative. Based on the results it can be stated that perceived usefulness exists when managers think that social media (1.) simplify tasks, (2.) through social media the innovation process can be handled more easy (Cowen, 2009) and (3.) social media give access to a great pool of information (Chang, 2004).

### Perceived Ease of Use (PEU)

According to conducted studies of Davis (1986) and Liu *et al.* (2010), individuals will intend to work with technologies when they think that they are easy to use. By involving these findings, the assumption - that led to the second hypothesis - was that if social media are easy to handle, managers intend to make use of them. In the linear regression, the significance level related to H2 was 0.209 and the beta<sub>PEU</sub> was 0.084. These numbers were the reason why H2 was rejected. It means that in this case there is no relationship between the "easiness" of using the technology social media and the managerial attitude to used it. This is converse to all available literature. One possible

explanation can be that nowadays it gets easier to use social media in business contexts and thus the importance of the PEU decreases. Another explanation might be that managers have to employ social media in order to be up-to-date and follow recent trends. Thus, managers can feel as if they are obliged to utilize social media in innovation processes and consequently, the perceived ease of use is not a relevant factor to take into consideration.

#### Perceived behavior control (PBC)

Ajzen (1991) characterized PBC by the ease or difficulty of a person in order to perform a certain behavior. Furthermore, the factor PBC is of high importance from a psychological view because of its impacts on intentions and actions (Ajzen, 1991). Studies have shown the confidence concerning someone's ability to perform a special activity, highly influences the person's behavior (Bandura *et al.*, 1977; Bandura *et al.*, 1980). The available literature supports H3 in which the relationship between the managers' PBC and their attitude towards using social media in innovation processes was investigated. The result displayed that this hypothesis had to be rejected because of  $p= 0.330$  and a low  $\beta_{PBC} = 0.064$ . In other words, the finding of this study is not conform to the theory. There exist several possible reasons for the lack of importance regarding the managers' confidence to use social media in innovation processes. For instance mangers might take social media for granted and so they are already able to confidently make use of them. As mentioned before, managers might be obliged to employ social media for innovation processes by their external environment and hence the importance of the manager's confidence decreases.

#### Subjective norm (SN)

Fishbein and Ajzen (1975) defined SN as the social environmental influence that impacts a person's perception and behavior. Furthermore, Venkatesh and Davis (2000) found out that SN is the explanation of why people behave in a specific way that might be not typical for them. Interesting are the results of Lewis *et al.*'s (2003) study because they stated that departmental peers, senior leaders and other social influences have no impact on new technology adoption. Therefore, the authors of this study investigated if social influences like peers and supervisors have an effect on the manager's attitude towards using social media in the innovation process. H4 was accepted due to a significance of  $p= 0.000$  and a  $\beta_{SN} = 0.350$ . These findings are in line with the research results of Fishbein and Ajzen (1975) and Venkatesh and Davis (2000), who stated that peers and senior leaders have an influence on the usage of social media in the innovation process. However, the questionnaire also asked for the influence of friends and if using social media in the job is a status symbol. Based on the results, this leads to the statement that the assumption is true that also personal environment influences the attitude towards using social media in innovation processes.

There might exist different factors or influences that explain this interesting result: (1.) managers get pressure from their peers, (2.) for managers the opinion of others has an high impact - private as well as “business” connections and (3.) examples of companies which successfully employ social media can affect the managers' points of view concerning using social media in innovation processes.

#### *Personal innovativeness (PIIT)*

Based on Lewis *et al.*'s (2003) study on how managers deal with IT in general, PIIT was added to TAM. The questions in the survey assumed that a manager who is interested in using the newest technology would also have a higher attitude towards using social media in the innovation process. However, surprisingly the results of H5 ( $p= 0.829$  and  $\beta_{PIIT} = 0.012$ ) reveal that this hypothesis have to be rejected. This means that there is no relationship between a manager's innovativeness and the attitude towards using social media. Based on the theory it was assumed that PIIT has a strong effect on ATT, but the data present another result that is not conform to former studies. The personal interest in experimenting with new technologies is not necessary for managers when integrating social media in innovation processes. The results imply that nowadays managers are forced to adapt to new technologies or new ways of making business and social media is one of these new ways, thus the importance of personal innovativeness is not given in this study's context. However, even when managers are not interested in these new technologies, they must employ them.

#### *Attitude towards using (ATT)*

Model 1 investigated the effect of the factors PEU, PU, PBC, SN and PIIT on ATT. Nevertheless, in model 2 and by testing H6, the influence of ATT on BI was tested.

According to Fishbein and Ajzen (1975), attitude describes specific a behavior. When investigating ATT in the context of TAM and TAM2, several empirical studies have exposed that the actual usage from a technical system is impacted by the user's attitude (Hassanein and Head, 2007). BI is one concept that is influenced by ATT. When using linear regression for analyzing the relationship between ATT and BI, the result was significant of  $p= 0.000$  and a tremendously high  $\beta_{ATT} = 0.854$ . Therefore, H6 was accepted and it can be said that the managerial ATT has high influence on the BI, which causes the use of social media in the innovation process. This is again contrary to already existing theory. Based on the results and the acceptance of H6 it is possible to state that the attitude towards using social media is necessary for the managers behavior intention to integrate

social media in innovation process. In other words when managers seem to have a positive attitude towards social media, they are also more open to use them. One explanation for this deduction is that people tend to use items they like and think positive about.

*In this chapter the most significant results are summarized. Furthermore, the reader can find a review on the purpose of the study. Additionally, some theoretical contributions are made. The limitations, managerial implications and suggestions for further research can be found in chapter 8.*

## **7.1 Conclusion**

The study's authors constructed a research model in order to test the hypotheses on the empirical data collected. This research model was based on the extended Technology Acceptance Model (TAM2) and was revised for the purpose of this research. The study's research model consisted of the factors PU, PEU, PBC, SN, PIIT, ATT and BI. It aimed to explain the influences between PU, PEU, PBC, SN and PIIT on managerial ATT towards using social media for innovation and to see if there is an effect of the attitude towards using on the BI of employing social media in innovation processes.

Due to the fact that the author's aim was to study social media behavior and its usage for business purposes, managers were asked to participate in the questionnaire for scrutinizing their use of social media in a business context. The managers' attitudes towards using social media in innovation processes was the study's focus and therefore the research at hand closed the research gap that exists regarding the lack of studies examining the relationship between the managers' attitudes and their use of social media in the innovation process. The conclusions derived from testing the hypotheses reveal that three of the six hypotheses are accepted. The results acquired in this study explain that the managers perceived usefulness as well as the impact of peers or other social persons are important considerations for managers when deciding to integrate social media into innovation processes. These findings partly support the research model and reconfirm the importance of external factors influencing managers, as represented by peers, senior leader or friends, as well as their personal, internal opinion, indicated by the perceived usefulness of social media. Nevertheless, three hypotheses are rejected. The empirical findings show that the PEU, PBC and PIIT do not have a significant impact on the managerial attitude towards integrating social media into innovation processes. Remarkably, the attitude towards using social media does significantly influence managers' behavior intention of integrating social media into innovation processes.

Prior research has stated the importance of integrating external parties, for instance consumers, into innovation processes. This user-centric innovation process has been the subject of many studies and represents a relatively new method of generating an innovative product or service. By opening up to

external parties, new ways need to be found in order to integrate customers into innovation processes. The Internet serves as an excellent platform for addressing external parties and makes it increasingly easy for managers to reach out to new ideas for new business opportunities. In more detail, social media with its numerous components and its ability to facilitate a two-way communication between customer and company offers novel techniques to be taken into consideration by managers. Nonetheless, not all managers might see the need for employing social media as a tool for innovation processes. Consequently, it is necessary to investigate managerial attitudes towards social media integration into innovation processes. Therefore, it can be stated that this study is innovative because it is among the first studies in this field that connects the TAM2 and social media in the managerial context. Thus, the empirical results of this study, are relevant to take into consideration for further studies.

In this research's context, the empirical findings disclose the significant influence of perceived usefulness, subjective norms and the attitude towards using social media on behavior intention regarding social media integration in the innovation process. However, perceived ease of use, perceived behavior control and personal innovativeness do not have a significant impact on the managerial attitude towards using social media in the innovation process in this study. These findings address the study's purpose which was to investigate the factors and relationships which have an influence on the managerial attitudes and the managers' intention to employ social media as an innovation tool.

## 7.2 Theoretical Contributions

The goal of this research was to explain the managerial attitude towards social media integration into innovation processes by using the factors of the extended Technology Acceptance Model (TAM2). The basic TAM aimed at investigating the two factors perceived usefulness and perceived ease of use to explain an individual's intention to use a technology. TAM and TAM2 have been a subject of numerous studies in the past in order to investigate factors that influence an individual to make use of a certain technology.

The study contributes to the theory by establishing a new research model. This model is used to explain the managerial attitude towards using social media in innovation processes based on the TAM2. This is an application that is new to the research landscape. Consequently, the TAM2 has been put into a new context, which focused on the business environment, rather than on the personal use of social media for private activities. Through the study at hand it is proven that only the three factors, including PU, SN and ATT, were significantly important for this research's context. This

could be an evidence that, especially in the area of social media, the TAM2 model might need to be revised from the standpoint of recent technologies.

## **8 Limitations, managerial implications and further research**

*This last chapter reveals the limitations of this study at hand. Furthermore, it gives practical, managerial recommendations and suggestions for further research.*

### **8.1 Managerial Implications**

Based on the results of this study and especially due to the accepted hypotheses, the following managerial recommendations can be given. A fact that social media have not been employed to a large extent is that a number of companies do not have sufficient knowledge, personnel and budget for using social media in innovation processes. A requirement for integrating social media successfully into the innovation process, are established social media channels, for example Facebook, with a certain amount of users.

Due to the fact that innovation is democratized at the present time, social media is regarded as a useful tool for reaching external parties including customers. However, not all managers respect social media as a necessary tool for creating innovation for business purposes. Accordingly, managers' perception of the usefulness of social media must be high in order for them to use it in innovation processes. Based on this result it can be assumed that managers must have the belief that social media increase their job performance. If this is not the case, they are likely to reject the chance of gaining valuable customer insights and ideas and decrease their business opportunities. Consequently, companies should foster their employees' and managers' confidence in using social media, for example by offering workshops that highlight the various possibilities of successfully employing social media in business contexts. In addition, hiring social media experts, including social media and community managers, might boost managers' personal perception of the usefulness of social media. Managers should be confronted with success stories of large companies employing social media, for example by creating online innovation communities, and should be persuaded to follow this trend of including customers in their business activities.

Moreover, the empirical results concerning of subjective norm reveals that high influential parties like peers and managers affect the managers' subjective norm, which has a significant influence on managers' decision to integrate social media into innovation processes. Furthermore, they might be encouraged or even be pushed by external parties to use social media for innovation processes. Social media can be seen as a tool for open innovation. In addition, CEOs need to stimulate the use of social media within their companies among their managers and employees by motivating them to

use social media themselves. Meanwhile, CEOs or managers with a more conservative and traditional point of view need to be encouraged to embrace the novel advantages of using social media, otherwise potential financial opportunities might be missed. As a result, CEOs and managers should have regular conversations with social media experts who can provide them with useful information regarding social media integration into innovation processes. Also, the aforementioned workshops, advanced trainings and visiting innovation fairs might broaden managers' and CEOs' perspectives on employing social media in innovation processes. All these actions should result in the promotion of using new technologies for establishing a culture of open innovation. These activities will influence the managers ATT positively and will result in an active desire to use social media.

## 8.2 Limitations

The first limitation that might have an influence on this study is the factor of time. As the time period for conducting this study was limited, only a small number of managers were given the opportunity to participate in the questionnaire. Therefore, it could be debatable to what extent the data and the results can be generalized. Relating to the time horizon of this study, a cross-sectional research design has been employed which only represents a certain point in time. As the data is gathered simultaneously, results were not observed over a longer period. Due to the fact that an individual's attitude towards a certain situation or action can change, only current managerial attitudes have been studied. Another fact that challenges the generalizability of the study, is that the respondents come from different industries. One reason is that in some industries innovation is much more important than in others which leads to a different integration of social media in the innovation process. The study at hand employed a convenience sample by selecting certain companies which were seen as "innovative" from a number of lists available on Internet websites. However, the criteria for "innovative" companies might have differed between the website authors, and thus the various sources might have chosen and neglected different companies which might have affected the findings of this study.

Based on the research approach – conducting a questionnaire – the second limitation arises relating to the lack of control over the respondents. As the questionnaire was sent out by e-mail and was published in social media forums, the authors had no control over the respondents they aimed to address because no information about the respondents' knowledge, education or function within the company was available. In addition, it might have been difficult for the respondents to ask questions related to the survey, which might lead to a misunderstanding over certain statements within the questionnaire. This might have led to incorrect answers. In order to avoid such errors, the purpose

of the study as well as terms like social media and IT, were explained at the beginning of the questionnaire. Furthermore, it was clearly defined that the study was looking for managers who deal with social media and innovation. An additional question regarding the respondent's position within the firm was added at the end of the questionnaire as an extra control instrument. Results revealed that the respondents had different professions in diverse departments. Thus, these managers are operating in various job positions, and have to fulfill different tasks which might have had an influence on the respondents' perception of social media. Consequently, it could have been a limitation that the questionnaire did not take various job professions into account.

Another limitation can be seen in the fact that the respondents came from all around the world. Therefore, it might be reasonable for other researchers to seek to increase creditability as regards to the ratio between the number of countries and the number of participants. It can be seen that there is an imbalance in the proportions of respondents from different countries. In this study many participants came from Germany and the USA. In addition, there is also an unequal proportion of male and female respondents. This might be a limitation because the female respondents' point of view, preferences and attitudes might differ from the male respondents. This makes it challenging to generalize the results for the whole population.

### **8.3 Further Research**

In this study, TAM and TAM2 was employed for explaining the managerial attitude towards using social media in innovation processes in business contexts. A suggestion for further research is to apply the constructed research model again in different contexts, for example by investigating other technologies and different industries.

Since the study at hand followed a cross-sectional research design, only current managerial attitudes have been examined. Hence, a suggestion for further research is carrying out a longitudinal study which observes the attitudes and perceptions of managers over a longer time period. It would be interesting to witness if their attitude changes over time and to see which factors have an influence on this occurrence.

Due to the fact that the majority of respondents is male, there is an uneven distribution of genders. It is possible that female and male managers differ in their technology acceptance and adoption of new tools for innovation processes. Hence, the second suggestion is to ask researchers to consider establishing an equal distribution of gender for further studies and to explore the different understandings and attitudes in using social media or innovation.

The respondents of this study have different professions. These job positions might have an influence on the respondents' perception of social media. Thus, future studies could emphasize certain professions by focusing on for example one type of job. Lastly, the study at hand analyzed the managerial attitudes of individuals from all over the world. Especially Germany and the USA were represented in this study, while managers of other countries did not participate at all. The use of the headquarter locations from different countries leads to possibility of controlling for the location's headquarter, for instance by employing a dummy variable related to the countries in a statistics software program. Due to the fact that there was a lack of respondents from a number of countries, it is advisable to concentrate on managers of certain countries, or even continents, in order to examine if there are different in their attitudes towards using social media in innovation processes.

Another interesting factor that should be included in further research is the factor "performance". Here it could be interesting to take a look on if the performance in developing and marketing a new product will rise when a manager thinks positively about using social media in innovation processes.

To summarize, the managerial attitude towards using social media for innovation serves as an important and interesting area for further empirical studies. Owing to the lack of research about managerial perceptions of social media and its connection to innovation processes, it becomes apparent that more studies are necessary to add new findings to the understanding of these phenomena. Thus, it is hoped that this research project will encourage further studies in the area of managerial perceptions, social media and innovation.

## References

- Aaker, D. A., Kumar, V., Day, G. S. and Leone, R. P., 2010. *Marketing research*. 10th ed. Hoboken, N.J.: Wiley.
- Adair, J., 2007. *Leadership for innovation: How to organize team creativity and Harvest ideas*. London: Kogan Page.
- Agnihotri, R., Kothandaraman, P., Kashyap, R. and Singh, R., 2012. Bringing "Social" into Sales: The Impact of Salespeople's Social Media Use on Service Behaviors and Value Creation. *Journal of Personal Selling & Sales Management*, 32(3), pp.333-348.
- Ahlqvist, T., Bäck, A., Halonen, M. and Heinonen, S., 2008. *Social media roadmaps*. Helsinki: Edita Prima Oy.
- Ajzen, I. and Fishbein, M., 1980. *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I., 1991. The Theory of Planned Behavior. *Organizational behavioral and human decision processes*, 50(2), pp.179-211.
- Ajzen, I., 2002. Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. *Journal of Applied Social Psychology*, 32(4), pp.665-683.
- Baldwin, C. Y. and von Hippel, E., 2009. Modeling a paradigm shift: From producer innovation to user and open collaborative innovation. *Organization Science*, 22(6), pp.1399-1417.
- Bandura, A., Adams, N. E. and Beyer, J., 1977. Cognitive processes mediating behavioral change. *Journal of Personality and Social Psychology*, 35(3), pp.125-139.
- Bandura, A., Adams, N. E., Hardy, A. B. and Howells, G. N., 1980. Tests of the generality of self-efficacy theory. *Cognitive Therapy and Research*, 4(1), pp.39-66.
- Barclay, I., 1992. The new product development process: past evidence and future practical application, Part 1. *R&D Management*, 22(3), pp.255-264.
- Baregheh, A., Rowley, J. and Sambrook, S., 2009. Towards a multidisciplinary definition of innovation. *Management Decision*, 47(8), pp.1323-1339.
- Bilgram, V., Brem, A. and Voigt, K., 2008. User-Centric Innovations in New Product Development: Systematic Identification of Lead User Harnessing Interactive and Collaborative Online-Tools. *International Journal of Innovation Management*, 12(3), pp.419-458.
- Bortz, J., 2005. *Statistik für Human- und Sozialwissenschaftler*. 6th ed. Berlin, Heidelberg, New York: Springer.

Bourque, L. B. and Fielder, E. P., 1995. *The survey kit : TSK. 3, How to conduct self-administered and mail surveys*. Thousand Oaks, Calif.: Sage.

Bryman, A. and Bell, E., 2011. *Business research methods*. 3rd ed. Oxford: Oxford University Press.

Bryman, A., 2012. *Social Research Methods*. 4th ed. Oxford: Oxford University Press.

Busscher, N., 2013. *Social Media: their role as marketing tools in B2B Marketing*. Bachelor thesis. University of Twente.

Carbonell, P., Rodriguez-Escudero, A.I. and Pujari, D., 2009. Customer involvement in new service development: an examination of antecedents and outcomes. *Journal of Product Innovation Management*, 26(5), pp.536-550.

Chang, P. V., 2004. *The validity of an extended technology acceptance model (TAM) for predicting intranet/portal usage*. Master thesis. University of North Carolina, Chapel Hill, NC.

Chesbrough, H. W., 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston, MA: Harvard Business School Press.

Chesbrough, H., 2006. Open innovation: a new paradigm for understanding industrial innovation. In: Chesbrough, H., Vanhaverbeke, W. and West, J., 2006. *Open Innovation. Researching a New Paradigm*. Oxford: Oxford University Press.

Chesbrough, H., Vanhaverbeke, W. and West, J., 2006. *Open Innovation. Researching a New Innovation Paradigm*. Boston: Harvard Business School Press.

Cooper, R.G., 1993. *Winning at new products: accelerating the process from idea to launch*. 2nd ed. Reading, MA: Addison-Wesley.

Cowen, J. B., 2009. *The influence of perceived usefulness, perceived ease of use, and subjective norm on the use of computed radiography systems: a pilot study*. [online] Available at: <<https://kb.osu.edu/dspace/bitstream/handle/1811/36983/FinalSubmitted.pdf>> [Accessed April 12, 2014].

Culnan, M. J., Mchugh, P. J. and Zubillaga, J. I., 2010. How Large U.S. Companies Can Use Twitter And Other Social Media To Gain Business Value. *MIS Quarterly Executive*, 9(4), pp.243-259.

Damanpour, F., 1991. Organizational innovation – a meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34(3), pp.555-590.

Damanpour, F., 1996. Organizational complexity and innovation: developing and testing multiple contingency models. *Management Science*, 42(5), pp.693-716.

Davis, F.D., 1986. *A technology acceptance model for empirically testing new end-user information systems: theory and results*. Doctoral dissertation. Massachusetts Institute of Technology.

Enders, A., Hungenberg, H., Denker, H. P. and Mauch, S., 2008. The long tail of social networking.: Revenue models of social networking sites. *European Management Journal*, 26(3), pp.199-211.

Enkel, E., Gassmann, O. and Chesbrough, H., 2009. Open R&D and open innovation: exploring the phenomenon. *R&D Management*, 39(4), pp.311-316.

Ernst, M., Brem, A. and Voigt, K.I., 2013. Innovation Management, Lead-Users, and Social Media — Introduction of a Conceptual Framework for Integrating Social Media Tools in Lead-User Management. *Social Media in Strategic Management (Advanced Series in Management)*, 11, pp.169-195.

Ettlie, J.E. and Reza, E.M., 1992. Organizational integration and process innovation. *Academy of Management Journal*, 35(4), pp.795-827.

Fishbein, M. and Ajzen, I., 1975. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.

Franke, N. and Shah, S., 2003. How communities support innovative activities: an exploration of assistance and sharing among end-users. *Research Policy*, 32(1), pp.157-178.

Gallaugh, J. and Ransbotham, S., 2010. Social Media and Customer Dialog Management at Starbucks. *MIS Quarterly Executive*, 9(4), pp.197-212.

Gassmann, O., 2006. Opening up the innovation process: towards an agenda. *R&D Management*, 36 (3), pp.223-228.

Gruner, K.E. and Homburg, C., 2000. Does customer interaction enhance new product success. *Journal of Business Research*, 49(1), pp.1-14.

Hart, S., Tzokas, N. and Saren, M., 1999. The effectiveness of market information in enhancing new product success rates. *European Journal of Innovation Management*, 2(1), pp.20-35.

Hassanein, K. and Head, M., 2007. Manipulating perceived social presence through the web interface and its impact on attitude towards online shopping. *Int. J. Human-Computer Studies*, 65(8), pp.689-708.

Hsiehm, K.-N. and Tidd, J., 2012. Open versus closed new service development: the influences of project novelty. *Technovation*, 32(11), pp.600-608.

Huizingh, E.K., 2011. Open innovation: state of the art and future perspectives. *Technovation*, 31(1), pp.2-9.

Kaplan, A. and Haenlein, M., 2010. Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53(1), pp.59-68.

Kärkkäinen, H., Jussila, J. and Janhonen, J., 2011. Managing customer information and knowledge with social media in business-to-business companies. *ACM International Conference Proceeding Series*, pp.1-8.

Kristensson, P., Gustafsson, A. and Archer, T., 2004. Harnessing the creative potential among users. *Journal of Product Innovation Management*, 21(1), pp.4-15.

Laursen, K. and Salter, A., 2006. Open for Innovation: The Role of Openness in Explaining Innovation Performance Among UK Manufacturing Firms. *Strategic Management Journal*, 27(2), pp.131-150.

Lewis, W., Agarwal, R., and Sambamurthy, V., 2003. Sources of influence on beliefs about information technology use: an empirical study of knowledge workers. *MIS Quarterly*, 27(4), pp.657-679.

LinkedIn, 2014. World's largest professional network. [online] Available at: <<https://www.linkedin.com/>> [Accessed 01 April 2014].

Liu, C., Marchewkab, J. T., Luc, J. and Yud, C.-S., 2005. Beyond concern—a privacy-trust-behavioral intention model of electronic commerce. *Information & Management*, 42(1), pp.289-304.

Liu, I., Chen, M., Sun, Y., Wible, D. and Kuo, C., 2010. Extending the TAM Model to Explore the Factors that Affect Intention to Use an Online Learning Community. *Computers & Education*, 54(2), pp.600-610.

Lu, J., Yao, J.E, and Yu, C.S., 2005. Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *Journal Of Strategic Information Systems*, 14(3), pp.245-268.

Mahr, D. and Lievens, A., 2012. Virtual lead user communities: Drivers of knowledge creation for innovation. *Research Policy*, 41(1), pp.167-177.

Malhotra, N. K., 2010. *Marketing research: An applied orientation*. 6th ed. New Jersey: Pearson Education.

Mangold, W. G. and Faulds, D. J., 2009. Social media: The new hybrid element of the promotion mix. *Business horizons*, 52(4), pp.357-365.

Mansfield, E., 1986. Patents and innovation: An empirical study. *Management Science*, 32(2), pp.173-181.

McGivern, Y., 2009. *The practice of market research: An introduction*. 3rd ed. Pearson Education.

Miller, R.L. and Brewer, J.D., 2003. *The A-Z of social research a dictionary of key social science research concepts*. London: SAGE Publications.

Narayanan, M., Asur, S., Nair, A., Rao, S., Kaushik, A., Mehta, D., Athalye, S., Malhotra, A., Almeida, A. and Lalwani, R., 2012. Social Media and Business. *Vikalpa: The Journal for Decision Makers*, 37(4), pp.69-111.

Nath, R., Bhal, K. T., and Kapoor, G. T., 2014. Factors influencing IT Adoption by Bank Employees: An Extended TAM Approach. *Vikalpa: The Journal for Decision Makers*, 38(4), pp.83-96.

Nelson, R.R. and Winter, S.G., 1982. *An Evolutionary Theory of Economic Change*. Cambridge, MA: Belknap Press of Harvard University Press.

Nord, W. and Tucker, S., 1987. *Implementing Routine and Radical Innovations*. Lexington, MA: Lexington Books.

Piller, F. and Walcher, D., 2006. Toolkits for idea competitions: a novel method to integrate users in new product development. *R&D Management*, 36(3), pp.307-318.

Piller, F., Vossen, A. and Ihl, C., 2012. From social media to social product development: the impact of social media on co-creation of innovation. *Unternehmung*, 65(1), pp.1-22.

Plessis, M.D., 2007. The role of knowledge management in innovation. *Journal of Knowledge Management*, 11(4), pp.20-29.

Ramayah, T., Yusoff, Y. M., Jamaludin, N. and Ibrahim, A., 2009. Applying the Theory of Planned Behavior (TPB) to Predict Internet Tax Filing Intentions. *International Journal of Management*, 26(2), pp.272-284.

Rauniar, R., Rawski, G., Yang, J. and Johnson, B., 2014. Technology acceptance model (TAM) and social media usage: an empirical study on Facebook. *Journal of Enterprise Information Management*, 27(1), pp.6-30.

Reichwald, R. and Piller, F. T., 2009. *Interaktive Wertschöpfung: Open Innovation, Individualisierung und neue Formen der Arbeitsteilung*. 2nd ed. Wiesbaden: Springer Verlag.

Robson, C., 2002. *Real World Research: A Resource for Social Scientists and Practitioner-Researchers*. Oxford: Blackwell.

Rodriguez, M., Peterson, R. M. and Krishnan, V., 2012. Social Media's Influence on Business-To-Business Sales Performance. *Journal of Personal Selling & Sales Management*, 32(3), pp.365-378.

Rogers, E. M., 1983. *Diffusion of Innovations*. 3rd ed. New York: Free Press.

Saunders, M., Lewis, P. and Thornhill, A., 2009. *Research methods for business students*. Harlow, UK: Pearson Education Limited.

Schumpeter, J.A., 1950. *Capitalism, Socialism and Democracy*. 3rd ed. New York, NY: Harper & Row.

Singh, K., 2007. *Quantitative Social Research Methods*. New Delhi: Sage Publications.

Sun, Q., Wang, C. and Cao, H., 2009. An extended TAM for analyzing adoption behavior of mobile commerce. In: Publisher: *Mobile Business, 2009. ICMB 2009. Eighth International Conference on*. Dalian, China. USA: IEEE.

Trainor, K. J., 2012. Relating Social Media Technologies to Performance: A Capabilities-Based Perspective. *Journal of Personal Selling & Sales Management*, 32(3), pp.317-331.

Treviño, L. K., Webster, J. and Stein, E. W., 2000. Making connections: Complementary influences on communication media choices, attitudes, and use. *Organization Science*, 11(2), pp.163-182.

Van der Meer, J. D., 1996. Profile of an innovative organization. In: Prokopenko, J. and North, K., 1999. *Productivity and quality management: A modular programme*. Geneva: International Labour Org.

Vanhaverbeke, W., Cloodt, M. and Van de Vrande, V., 2007. Connecting absorptive capacity and open innovation. In: *Centre for Advanced Study Workshop on Innovation in Firms*.

Vanhaverbeke, W., Van de Vrande, V. and Chesbrough, H., 2008. Understanding the advantages of open innovation practices in corporate venturing in terms of real options. *Creativity and Innovation Management*, 17(4), pp.251-258.

Venkatesh, V. and Davis, F. D., 2000. A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), pp.186-204.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D., 2003. User acceptance of information technology: Toward a unified view. *MIS quarterly*, 27(3), pp.425-478.

von Hippel, E., 1988. *The Sources of Innovation*. USA: Oxford University Press.

von Hippel, E., 2005. *Democratizing Innovation*. Cambridge, MA: The MIT Press.

West, M. A., and Farr, J. L., 1990. *Innovation and creativity at work: Psychological and organizational strategies*. Chichester, UK: Wiley.

Westland, J.C., 2008. *Global Innovation Management: A Strategic Approach*. Basingstoke: Palgrave Macmillan.

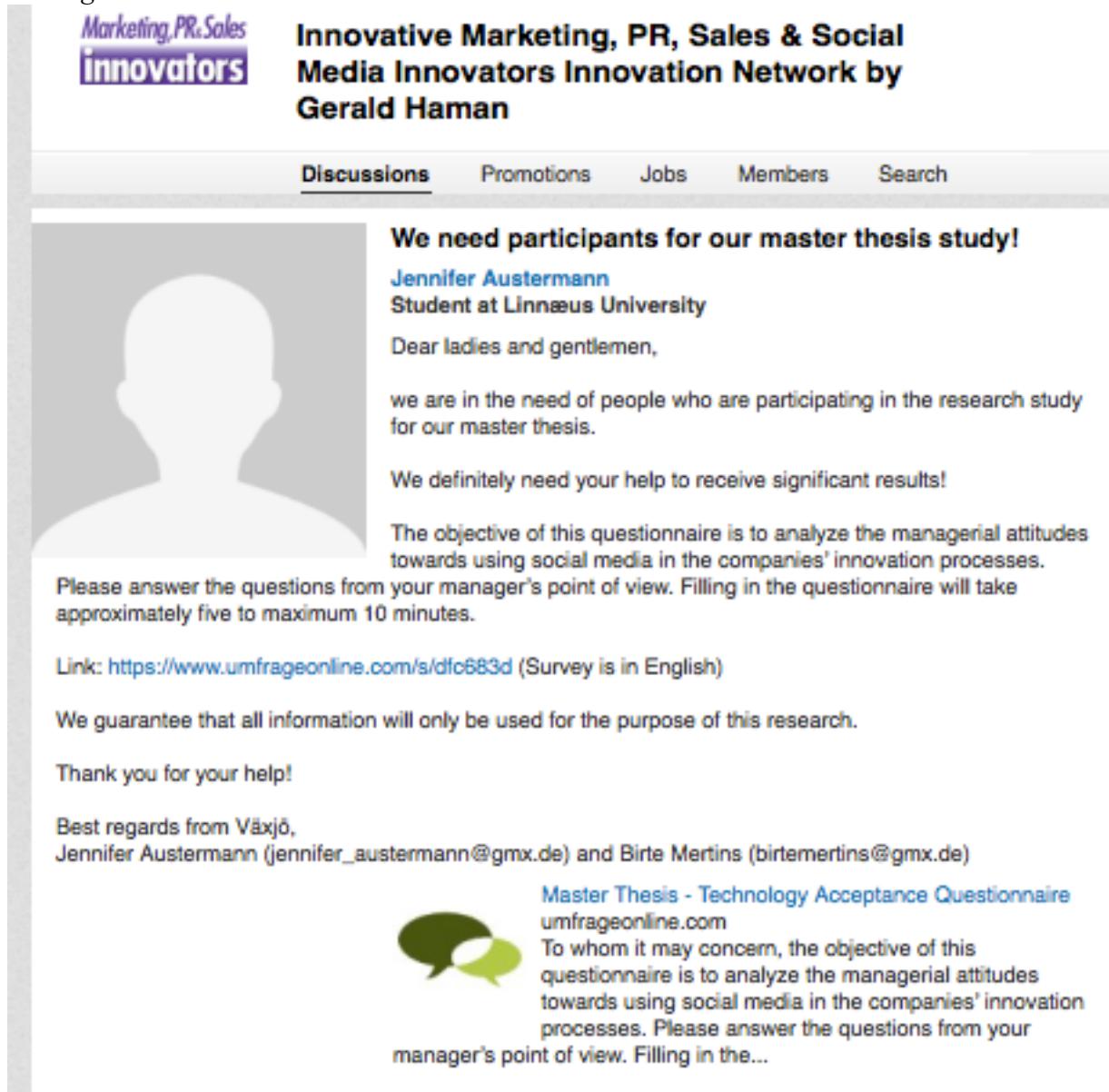
XING AG, 2014. For a better working life. [online] Available at: <<https://www.xing.com/>> [Accessed 01 April 2014]



# Appendices

## Appendix A: Questionnaire

*Posting in LinkedIn:*



The screenshot shows a LinkedIn post from the group "Marketing, PR, Sales innovators". The post is titled "Innovative Marketing, PR, Sales & Social Media Innovators Innovation Network by Gerald Haman". It features a large profile picture placeholder on the left. The main text reads:

**We need participants for our master thesis study!**

**Jennifer Austermann**  
Student at Linnæus University

Dear ladies and gentlemen,

we are in the need of people who are participating in the research study for our master thesis.

We definitely need your help to receive significant results!

The objective of this questionnaire is to analyze the managerial attitudes towards using social media in the companies' innovation processes.

Please answer the questions from your manager's point of view. Filling in the questionnaire will take approximately five to maximum 10 minutes.

Link: <https://www.umfrageonline.com/s/dfc683d> (Survey is in English)

We guarantee that all information will only be used for the purpose of this research.

Thank you for your help!

Best regards from Växjö,  
Jennifer Austermann ([jennifer\\_austermann@gmx.de](mailto:jennifer_austermann@gmx.de)) and Birte Mertins ([birtemertins@gmx.de](mailto:birtemertins@gmx.de))

 Master Thesis - Technology Acceptance Questionnaire  
umfrageonline.com  
To whom it may concern, the objective of this questionnaire is to analyze the managerial attitudes towards using social media in the companies' innovation processes. Please answer the questions from your manager's point of view. Filling in the...

*Web Survey:*

### **Master Thesis - Technology Acceptance Questionnaire**

#### **Introduction**

To whom it may concern,

the objective of this questionnaire is to analyze the managerial attitudes towards using social media in the companies' innovation processes. Please answer the questions from your manager's point of view. Filling in the questionnaire will take approximately five minutes.

We guarantee that all information will only be used for the purpose of this research.

We appreciate your support a lot.

Thank you for your reply in advance!

Best regards from Växjö,  
Birte Mertins ([birtemertins@gmx.de](mailto:birtemertins@gmx.de)) and Jennifer Austermann ([jennifer\\_austermann@gmx.de](mailto:jennifer_austermann@gmx.de))

## Perceived Usefulness (PU)

Please place an "X" in the appropriate box to rate the following items regarding "Perceived Usefulness (PU)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

**Social media:** "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

**Information technology:** "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

	1	2	3	4	5	N/A
Social media enable me to accomplish tasks more quickly when searching for innovations.	<input type="radio"/>					
Social media have improved the quality of innovations within our business.	<input type="radio"/>					
Social media make it easier to innovate.	<input type="radio"/>					
Social media have improved the innovation productivity.	<input type="radio"/>					
Social media give me greater control over innovation processes.	<input type="radio"/>					
The use of social media increases the effectiveness of performing tasks (e.g. communication with innovators).	<input type="radio"/>					
Using social media gives me access to a lot of information.	<input type="radio"/>					
Social media provide thorough information for my purposes.	<input type="radio"/>					
The advantages of social media in innovation processes outweigh the disadvantages.	<input type="radio"/>					

## Perceived Ease of Use (PEU)

Please place an "X" in the appropriate box to rate the following items regarding "Perceived Ease of Use (PEU)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

**Social media:** "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

**Information technology:** "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

	1	2	3	4	5	N/A
My interaction with social media in innovation processes has been clear and understandable.	<input type="radio"/>					
Overall, social media are easy to use.	<input type="radio"/>					
Learning to operate with social media was easy for me.	<input type="radio"/>					
The use of social media for innovation does not confuse me.	<input type="radio"/>					
Social media are easy to navigate.	<input type="radio"/>					
Using social media enables me to have more accurate information.	<input type="radio"/>					

## Perceived behavior control (PBC)

Please place an "X" in the appropriate box to rate the following items regarding "Perceived behavior control (PBC)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

**Social media:** "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

**Information technology:** "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

	1	2	3	4	5	N/A
I am able to confidently use social media for innovation processes.	<input type="radio"/>					
I have the knowledge to use social media for innovation processes.	<input type="radio"/>					
I have the resources to use social media for innovation processes.	<input type="radio"/>					
I have control over using social media for innovation processes.	<input type="radio"/>					

## Social norm (SN)

Please place an "X" in the appropriate box to rate the following items regarding "Social Norm (SN)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

**Social media:** "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

**Information technology:** "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

**Peers:** "Someone who belongs to the same social or professional group as another person." (e.g. colleague on the same career level)

	1	2	3	4	5	N/A
My immediate supervisor thinks I should use social media for innovation processes.	<input type="radio"/>					
My close friends think I should use social media for innovation processes.	<input type="radio"/>					
My peers think I should use social media for innovation processes.	<input type="radio"/>					
My supervisor requires me to use social media for innovation processes.	<input type="radio"/>					
Generally speaking, I would use social media for innovation processes without pressure from external social factors	<input type="radio"/>					
People around me who use social media for innovation processes have more prestige than those who do not.	<input type="radio"/>					
Using social media for innovation processes is considered a status symbol among my friends.	<input type="radio"/>					

## Behavior intention (BI)

Please place an "X" in the appropriate box to rate the following items regarding "Behavior intention (BI)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

**Social media:** "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

**Information technology:** "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

	1	2	3	4	5	N/A
I intend to continue using social media for innovation processes to perform my job.	<input type="radio"/>					
I intend to frequently use social media for innovation processes to perform my job.	<input type="radio"/>					
Assuming I have access to social media for innovation processes, I intend to adopt it.	<input type="radio"/>					
Given that I have access to social media for innovation processes, I predict that I would adopt it.	<input type="radio"/>					

## Attitude towards using (ATT)

Please place an "X" in the appropriate box to rate the following items regarding "Attitude towards using (ATT)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

**Social media:** "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

**Information technology:** "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

	1	2	3	4	5	N/A
I think positively about using social media for innovation processes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media are a positive tool for innovation processes for our company.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using social media for innovation processes is a wise idea.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social media are worth to use within the innovation process.	<input checked="" type="radio"/>	<input type="radio"/>				
I plan on using social media for innovation processes on a regular basis in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using social media within the innovation process is pleasant.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Personal Innovativeness (PIIT)

Please place an "X" in the appropriate box to rate the following items regarding "Personal Innovativeness (PIIT)", using a scale of 1-5:

- 1= Strongly Disagree
- 2= Disagree
- 3= Partly/partly
- 4= Agree
- 5= Strongly Agree

### Definitions

Social media: "Computer applications that people use in order to create and share information through social networking" (e.g. Facebook, Twitter, online Communities, blogs, etc.)

Information technology: "The study or use of computers and electronic systems for storing and using information. Information technology is often simply called IT."

	1	2	3	4	5	N/A
If I heard about a new information technology, I would look for ways to experiment with it.	<input type="radio"/>					
Among my peers, I am usually the first to explore new information technologies.	<input type="radio"/>					
I like to experiment with new information technologies.	<input type="radio"/>					
In general, I do not hesitate to try out new information technologies.	<input type="radio"/>					

## Actual Use (ACTUAL)

How many times do you use social media for innovation during a day?

- not every day
- 1 time per day
- 2 times per day
- 3 times per day
- 4 times per day
- 5 times per day
- 6 times per day
- constantly

How many times do you use social media for innovation during a week?

- not every week
- 1 day per week
- 2 days per week
- 3 days per week
- 4 days per week
- 5 days per week
- 6 days per week
- every day

## **Demographic Data**

Now, all questions of the regular questionnaires are answered and only demographic data is collected.

**Please state your gender.**

- female
- male

**Please state your age (in years).**

- younger than 21
- 21-30
- 31-40
- 41- 50
- 51-60
- above 61

**Please state the location of your company's headquarter. (Country is sufficient)**

**Please state your company's name and/or your e-mail address in case you want to receive the results of this study.**

**Please state your function within the company.**

## Appendix B: List of Groups

### **XING-groups:**

1. ASIA PACIFIC SME COMMUNITY (3,951 Members)
2. Australian-European Innovation Group (278 Members)
3. AUSTRIAN INNOVATION FORUM (428 Members)
4. Autohaus 2.0 - Näher am Kunden durch social media (343 Members)
5. Big Apple Business Club (285 Members)
6. Bonn Rhein-Sieg-Kreis (21,789 Members)
7. BrainSourcer - Open Innovation (22 Members)
8. BUSINESS SOCIAL MEDIA (151 Members)
9. Business, Trends and Innovation (108 Members)
10. CeBIT Bilişim Eurasia (3,380 Members)
11. Erster Arbeitskreis Social Media in der B2B-Kommunikation (559 Members)
12. Freiberufler Projektmarkt / freelance projects exchange (154,302 Members)
13. GEOPOLITICAL BUSINESS Community Club (19,833 Members)
14. Gründer und Selbständige (92,820 Members)
15. Handel zwischen Innovation und Praxis (648 Members)
16. Innovation Corporate Media – Informationsplattform (321 Members)
17. Innovation inside (36 Members)
18. Innovation Management (8,624 Members)
19. Innovation Risk and Innovation Management (38 Members)
20. iphone entwicklung (78 Members)
21. IT-Connection (78,953 Members)
22. Jahr der Kreativität und Innovation (856 Members)
23. Knowledge Management (5,890 Members)
24. Kontaktgruppe für Finanzdienstleister (9,214 Members)
25. MacHeads - Das Kompetenznetzwerk für Apple-Anwender (4,608 Members)
26. Management der Produktentwicklung (1,073 Members)
27. Management Innovation - Unternehmen anders führen (689 Members)
28. Marketing and Innovation Forum Europe (682 Members)
29. Marktforschung - Menschen, Wissen, Partner (7,880 Members)
30. NoAE Innovation-Competiton NoAE Innovations-Wettbewerb (2,189 Members)
31. offene Produktentwicklung (20 Members)
32. Open Innovation (2,488 Members)
33. Open Innovation and Collaboration (205 Members)
34. Open Innovation Club - Jeder hat Ideen! Jeder braucht Ideen! (1,448 Members)
35. open innovation Ideengeber (21 Members)
36. QUERDENKER-Club (104,671 Members)
37. Red Square - Die Innovations Community (17 Members)
38. Smart Grid - intelligente Stromnetze (1,627 Members)
39. Social Media in the Financial Industry (31 Members)
40. Swiss Association for Creativity and Innovation (285 Members)
41. Swiss Innovation Park (215 Members)
42. Technologie und Innovation in Ostwestfalen (8,492 Members)
43. technology, innovation and management (17 Members)
44. Vertrieb and Verkauf (95,655 Members)
45. Zeitgeist | Zukunft - international - megatrends - szenarien, utopien und visionen unserer welt von morgen (16,789 Members)

## LinkedIn-groups:

1. Innovation Excellence (22,445 members)
2. Innovation People Expert Innovators Creative Network by Gerald "Solutionman" Haman (23,468 members)
3. Innovation Management Group (17,058 members)
4. Strategy, Marketing and Innovation Forum (13,768 members)
5. Innovation and Entrepreneurship Society (9,560 members)
6. Social Media Innovators Innovation Network - Facebook, Twitter, YouTube by Gerald Haman (8,684 members)
7. Global Academic Innovation Network (GAIN) (4,939 members)
8. Innovation Management Institute (4,269 members)
9. Innovation Leaders (3,379 members)
10. New Product Development, Innovation and Growth (16,002 members)
11. Product Management, Marketing and Innovation (3,491 members)
12. Customer Service Innovation Group (17,308 members)
13. Product Design Innovation (8,259 members)
14. Innovation Process Management (4,286 members)
15. Consumer and Innovation Trends Network (3,926 members)
16. Management Innovation Exchange (3,378 members)
17. Marketing Innovation with LinkedIn (4,213 members)
18. Social Media and SEO | B2B Marketing Community (17,240 members)
19. Social Innovation Group (2,882 members)
20. Social Media Today (128,406 members)
21. Digital Marketing: Social Media, Search, Mobile and more (82,899 members)
22. Project Manager Community - Best Group for Project Management (223,474 members)
23. Product Management (45,812 members)
24. Telecoms Professionals: LTE, M2M, OTT, Cloud Computing, Mobile VAS, Apps and Telecom (400,000 members)
25. The Project Manager Network - #1 Group for Project Managers (543,959 members)
26. Technology Leadership Network ★ CIO ★ CTO ★ CEO ★ Chief information Officer IT Director Manager CFO (37,978 members)
27. New Product Development, Innovation and Growth (16,133 members)
28. "HORIZON 2020" Framework Programme for Research and Innovation [Official Group] (123,129 Members)
29. Social Media Mastery for Business Leaders (12,082 Members)
30. B2B Social Media (16,509 Members)
31. Brand Innovators, Branding Leadership Innovation Network from Gerald "Solutionman" Haman (14,676 Members)
32. Energy innovation by Statoil (45,525 Members)
33. Front End of Innovation (31,452 Members)
34. Innovative Marketing, PR, Sales and Social Media Innovators Innovation Network by Gerald Haman (266,876 Members)
35. Social Media and Digital Technology: Opportunities and Challenges (4,198 Members)
36. Social Media for Business (2,018 Members)
37. Social Media Marketing (862,050 Members)
38. Social Media Marketing Canada (2,615 Members)
39. User Group Management (61 Members)
40. Job Openings, Job Leads and Job Connections! (1,742,784 members)
41. E-Learning 2.0 (49,241 members)
42. The eLearning Guild (40,376 members)
43. Sweden, Denmark, Finland, Norway, Iceland - Scandinavia Group (4,678 members)

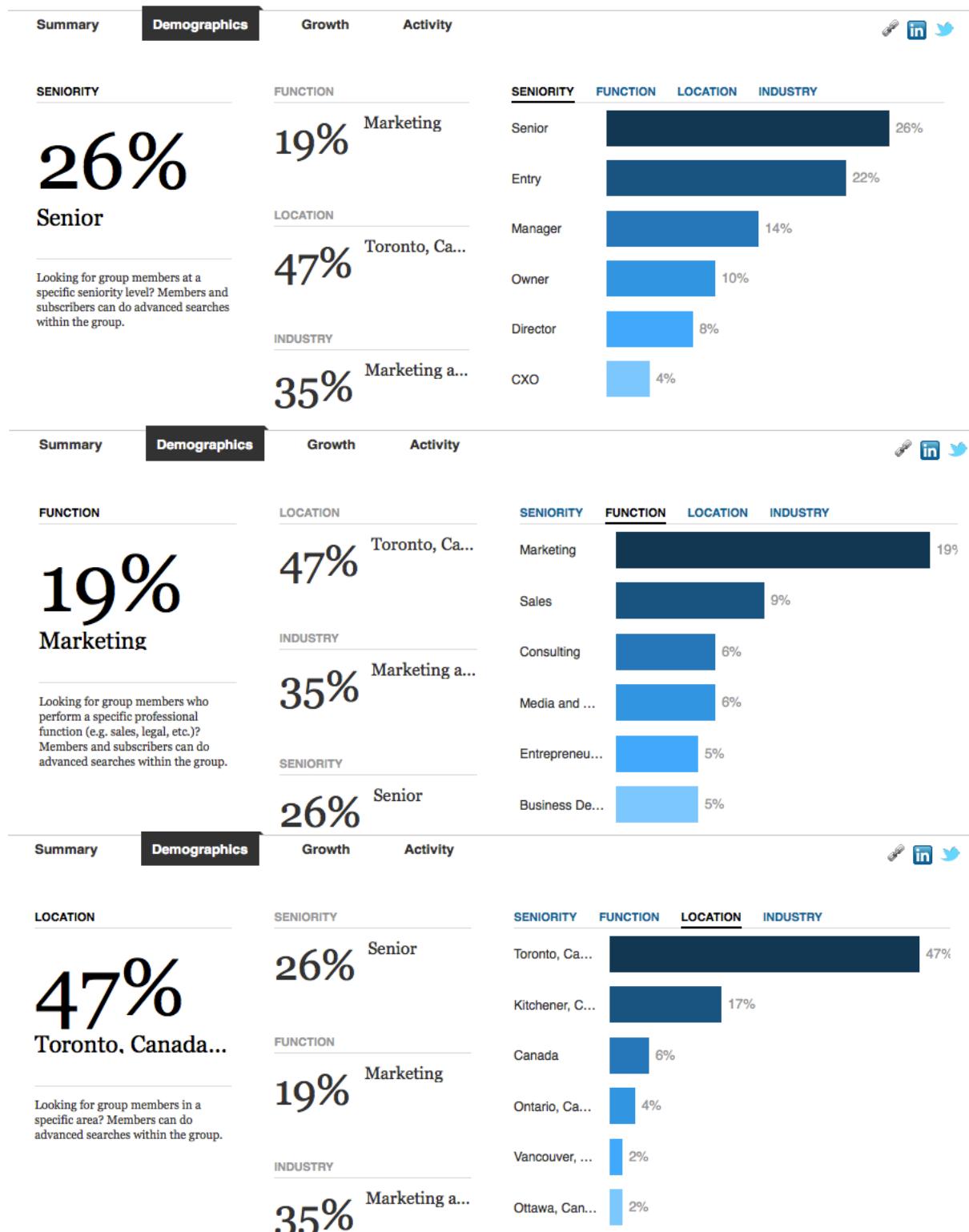
44. Scandinavian Networking [Sweden Norway Denmark Finland Iceland - Scandinavia Group]  
(8,721 members)

## Appendix C: Correlation between different items

		Correlations																															
		PU2	PU3	PU4	PU6	PU7	PU8	PU9	PEU1	PEU3	PEU5	PEU6	PBC1	PBC2	SN1	SN2	SN3	SN4	SN6	SN7	BI1	BI2	BI3	BI4	ATT1	ATT5	PIT1	PIT2	PIT3	PIT4			
P	Pearson	1	.679**	.622**	.571**	.478**	.519**	.561**	.449**	.144	.193*	.486**	.470**	.355**	.495**	.432**	.528**	.463**	.440**	.359**	.459**	.509**	.547**	.487**	.564**	.520**	.148	.189**	.173**	.102			
U	Correlation		.000	.000	.000	.000	.000	.000	.000	.000	.028	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.049	.045	.236				
2	Sig. (2-tailed)																																
N		136	134	133	136	136	136	136	136	135	136	135	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136			
P	Pearson	.679**	1	.730**	.589**	.559**	.551**	.679**	.476**	.096	.150	.572**	.521**	.276**	.534**	.567**	.631**	.478**	.392**	.381**	.529**	.638**	.616**	.589**	.642**	.627**	.047	.020	.103	.110			
U	Correlation																																
3	Sig. (2-tailed)																																
N		134	135	132	135	135	135	135	135	134	129	135	135	135	134	134	135	135	135	135	135	135	135	135	134	135	135	134	135	135			
P	Pearson	.622**	.730**	1	.604**	.489**	.467**	.577**	.498**	.043	.118	.540**	.575**	.380**	.545**	.605**	.566**	.501**	.502**	.408**	.617**	.678**	.616**	.631**	.688**	.155	.160	.229**	.134				
U	Correlation																																
4	Sig. (2-tailed)																																
N		133	132	133	133	133	133	133	133	132	127	133	133	133	132	133	133	132	133	133	132	133	133	132	133	133	132	133	133	132			
P	Pearson	.571**	.589**	.604**	1	.537**	.488**	.619**	.456**	.225**	.293**	.489**	.534**	.444**	.491**	.615**	.640**	.463**	.385**	.354**	.585**	.577**	.549**	.537**	.607**	.621**	.290**	.276**	.366**	.234**			
U	Correlation																																
5	Sig. (2-tailed)																																
N		136	135	135	133	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	137	137	136	137			
P	Pearson	.478**	.559**	.489**	.532**	1	.617**	.664**	.363**	.259**	.257**	.419**	.475**	.226**	.421**	.498**	.424**	.192**	.286**	.255**	.534**	.512**	.513**	.536**	.578**	.506**	.206**	.104	.305**	.273**			
U	Correlation																																
7	Sig. (2-tailed)																																
N		136	135	133	137	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	137	136	137				
P	Pearson	.519**	.551**	.467**	.489**	.488**	1	.677**	.424**	.222**	.375**	.601**	.466**	.320**	.494**	.404**	.447**	.370**	.316**	.206**	.572**	.573**	.431**	.462**	.587**	.605**	.150	.128	.207**	.206**			
U	Correlation																																
8	Sig. (2-tailed)																																
N		136	135	135	133	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	137	136	137				
P	Pearson	.561**	.679**	.577**	.619**	.664**	.677**	1	.450**	.207**	.234**	.523**	.595**	.356**	.564**	.576**	.512**	.357**	.362**	.299**	.685**	.685**	.576**	.587**	.881**	.681**	.113	.107	.297**	.251**			
U	Correlation																																
9	Sig. (2-tailed)																																
N		136	135	135	133	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	137	136	137				
P	Pearson	.449**	.476**	.498**	.456**	.365**	.424**	.450**	1	.264**	.317**	.492**	.555**	.459**	.401**	.394**	.478**	.376**	.419**	.348**	.475**	.524**	.501**	.587**	.500**	.267**	.224**	.221**	.191**				
U	Correlation																																
10	Sig. (2-tailed)																																
N		136	135	133	137	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	136	137					
P	Pearson	.193**	.150	.118	.293**	.257**	.275**	.234**	.317**	.608**	1	.285**	.348**	.296**	.114	.090	.151	.025	.147	.087	.181**	.096	.187**	.230**	.258**	.140	.288**	.291**	.286**	.212**			
U	Correlation																																
11	Sig. (2-tailed)																																
N		130	129	127	131	131	131	131	131	130	131	131	131	130	131	131	131	130	131	131	131	131	131	131	131	131	131	131	131				
P	Pearson	.466**	.572**	.540**	.489**	.419**	.601**	.523**	.492**	.189**	.285**	1	.515**	.361**	.424**	.512**	.500**	.409**	.416**	.337**	.412**	.471**	.437**	.494**	.527**	.536**	.238**	.254**	.260**	.144			
U	Correlation																																
12	Sig. (2-tailed)																																
N		136	135	133	137	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	136	137					
P	Pearson	.470**	.521**	.575**	.534**	.475**	.466**	.535**	.553**	.362**	.348**	.515**	1	.583**	.505**	.466**	.525**	.411**	.311**	.295**	.606**	.596**	.474**	.579**	.568**	.581**	.196**	.219**	.345**	.182**			
U	Correlation																																
13	Sig. (2-tailed)																																
N		136	135	133	137	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	136	137					
P	Pearson	.495**	.534**	.545**	.491**	.421**	.494**	.564**	.401**	.078	.114	.424**	.505**	.371**	.1	.589**	.657**	.720**	.409**	.399**	.590**	.648**	.517**	.529**	.667**	.145	.247**	.276**	.177**				
U	Correlation																																
14	Sig. (2-tailed)																																
N		136	135	133	137	137	137	137	137	136	131	137	137	137	135	135	136	137	137	137	137	137	137	137	137	137	136	137					
P	Pearson	.432**	.631**	.605**	.615**	.401**	.576**	.394**	-.003	.090	.512**	.466**	.281**	1	.803**	.540**	.483**	.572**	.582**	.656**	.580**	.587**	.551**	.654**	.252**	.281**	.201**						
U	Correlation																																
15	Sig. (2-tailed)																																
N		136	135	133	137	137																											

## Appendix D: Examples of group statistics (screenshots)

### LinkedIn – Group: Social Media Marketing Canada



**INDUSTRY**

**35%**  
Marketing and A...

Looking for group members in a specific industry? Members can do advanced searches within the group.

**SENIORITY**

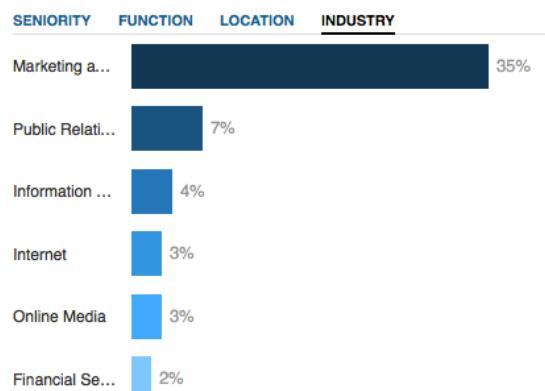
**26%** Senior

**FUNCTION**

**19%** Marketing

**LOCATION**

**47%** Toronto, Ca...



## LinkedIn – Group: User Group Management

**SENIORITY**

**28%**  
Manager

Looking for group members at a specific seniority level? Members and subscribers can do advanced searches within the group.

**LOCATION**

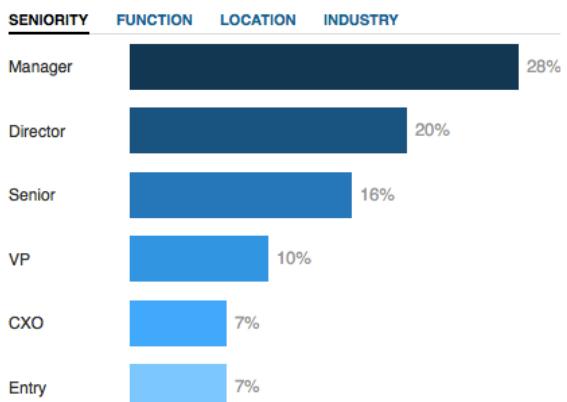
**7%** Greater Min...

**INDUSTRY**

**31%** Information...

**FUNCTION**

**21%** Marketing



**FUNCTION**

**21%**  
Marketing

Looking for group members who perform a specific professional function (e.g. sales, legal, etc.)? Members and subscribers can do advanced searches within the group.

**LOCATION**

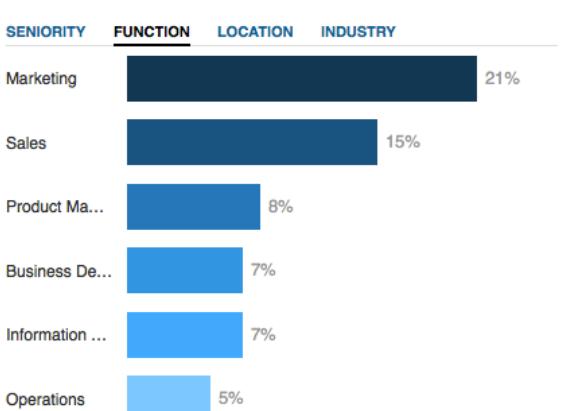
**7%** Greater Min...

**INDUSTRY**

**31%** Information...

**SENIORITY**

**28%** Manager



## Appendix D: Output SPSS

### *Descriptive Statistics*

**Overview of Distribution of Respondents' Gender**

		Frequency	Percent
Valid	female	38	27,7
	male	99	72,3
	Total	137	100,0

**Overwiev of Distribution of Respdents' Age**

		Frequency	Percent
Valid	age 21-30	15	10,9
	age 31-40	44	32,1
	age 41-50	37	27,0
	age 51-60	27	19,7
	above age 61	14	10,2
	Total	137	100,0

**Overview of the actual use per day**

		Frequency	Percent
Valid	not every day	27	19,7
	1 time per day	32	23,4
	2 times per day	19	13,9
	3 times per day	23	16,8
	4 times per day	6	4,4
	5 times per day	5	3,6
	6 times per day	4	2,9
	constantly	21	15,3
	Total	137	100,0

**Overview of actual use per week**

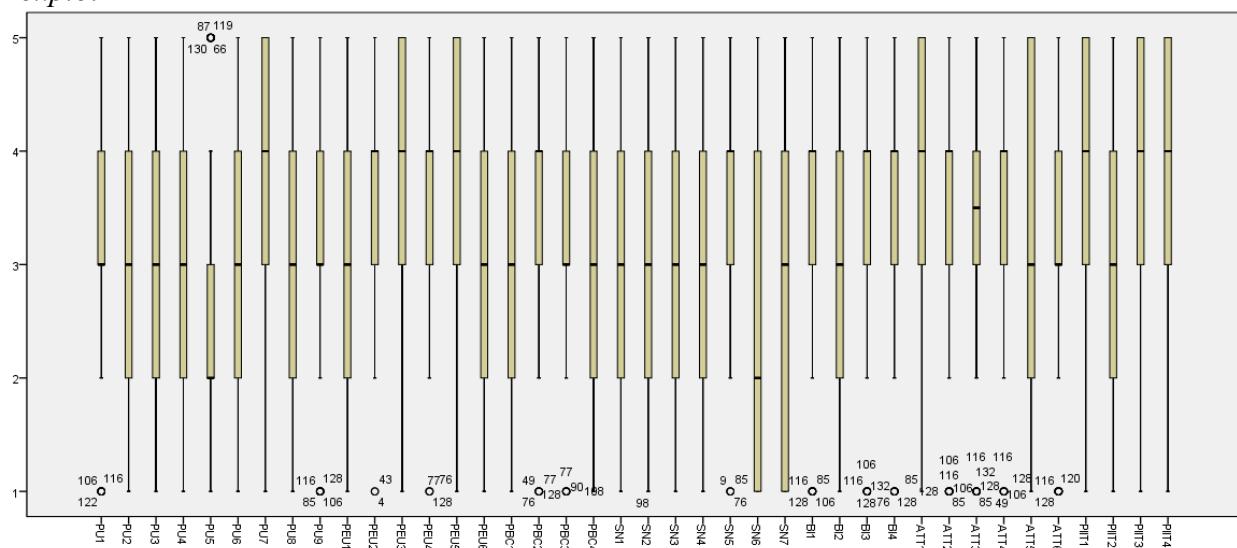
		Frequency	Percent
	not every week	21	15,3
	1 time per week	18	13,1
	2 times per week	10	7,3
	3 times per week	21	15,3
	4 times per week	4	2,9
	5 times per week	21	15,3

6 times per week	8	5,8
constantly	34	24,8
Total	137	100,0

#### Overview of distribution of originin of the headquarter

Country	Frequency
Belgium	1
Bosnia and Herzegovina	1
Brazil	1
China	1
Ireland	1
Israel	1
Italy	1
Netherlands	1
Serbia	1
Sweden	1
Australia	2
India	2
Nigeria	2
Norway	2
United Kingdom	2
Canada	3
Switzerland	5
Austria	6
USA	14
Germany	44

Boxplot



## Hierarchical linear regression

### Model 1

## Regression

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	Age, Gender <sup>b</sup> PBCall, PITCall,	.	Enter
2	SNall, PEUall, PUall <sup>b</sup>	.	Enter

a. Dependent Variable: ATTall

b. All requested variables entered.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,177 <sup>a</sup>	,031	,017	1,16946	,031	2,172	2	134	,118
2	,845 <sup>b</sup>	,715	,699	,64710	,683	61,731	5	129	,000

a. Predictors: (Constant), Age, Gender

b. Predictors: (Constant), Age, Gender, PBCall, PITCall, SNall, PEUall, PUall

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,940	2	2,970	2,172	,118 <sup>b</sup>
	Residual	183,264	134	1,368		
	Total	189,204	136			
2	Regression	135,187	7	19,312	46,120	,000 <sup>c</sup>
	Residual	54,018	129	,419		
	Total	189,204	136			

a. Dependent Variable: ATTall

b. Predictors: (Constant), Age, Gender

c. Predictors: (Constant), Age, Gender, PBCall, PITCall, SNall, PEUall, PUall

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
1	(Constant)	4,359	,479	9,096	,000
	Gender	-,152	,227	-,668	,505
	Age	-,160	,088	-1,823	,071

2	(Constant)	-,138	,400		-,344	,731
	Gender	,122	,130	,046	,937	,351
	Age	-,082	,049	-,081	-1,673	,097
	PUall	,563	,095	,456	5,928	,000
	PBCall	,075	,077	,064	,979	,330
	PEUall	,123	,097	,084	1,264	,209
	SNall	,405	,077	,350	5,249	,000
	PITTall	,014	,067	,012	,216	,829

a. Dependent Variable: ATTall

#### Excluded Variables<sup>a</sup>

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
					Tolerance
1	PUall	,790 <sup>b</sup>	14,847	,000	,790
	PBCall	,563 <sup>b</sup>	8,023	,000	,571
	PEUall	,545 <sup>b</sup>	7,599	,000	,550
	SNall	,732 <sup>b</sup>	12,508	,000	,735
	PITTall	,308 <sup>b</sup>	3,788	,000	,312

a. Dependent Variable: ATTall

b. Predictors in the Model: (Constant), Age, Gender

## Model 2

### Regression

#### Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	Age, Gender <sup>b</sup>	.	Enter
2	ATTall <sup>b</sup>	.	Enter

a. Dependent Variable: Blall

b. All requested variables entered.

#### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,112 <sup>a</sup>	,013	-,002	1,09695	,013	,857	2	134	,427
2	,848 <sup>b</sup>	,719	,713	,58690	,707	335,119	1	133	,000

a. Predictors: (Constant), Age, Gender

b. Predictors: (Constant), Age, Gender, ATTall

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,062	2	1,031	,857	,427 <sup>b</sup>
	Residual	161,244	134	1,203		
	Total	163,306	136			
2	Regression	117,494	3	39,165	113,702	,000 <sup>c</sup>
	Residual	45,812	133	,344		
	Total	163,306	136			

a. Dependent Variable: Blall

b. Predictors: (Constant), Age, Gender

c. Predictors: (Constant), Age, Gender, ATTall

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
1	(Constant)	3,577	,450		
	Gender	,157	,213	,065	,461
	Age	-,098	,082	-,104	,234
2	(Constant)	,117	,306		
	Gender	,278	,114	,114	,016
	Age	,028	,044	,030	,523
	ATTall	,794	,043	,854	,000

a. Dependent Variable: Blall

**Excluded Variables<sup>a</sup>**

Model	Beta In	t	Sig.	Partial Correlation	Collinearity Statistics	
					Tolerance	
1	ATTall	,854 <sup>b</sup>	18,306	,000	,846	,969

a. Dependent Variable: Blall

b. Predictors in the Model: (Constant), Age, Gender