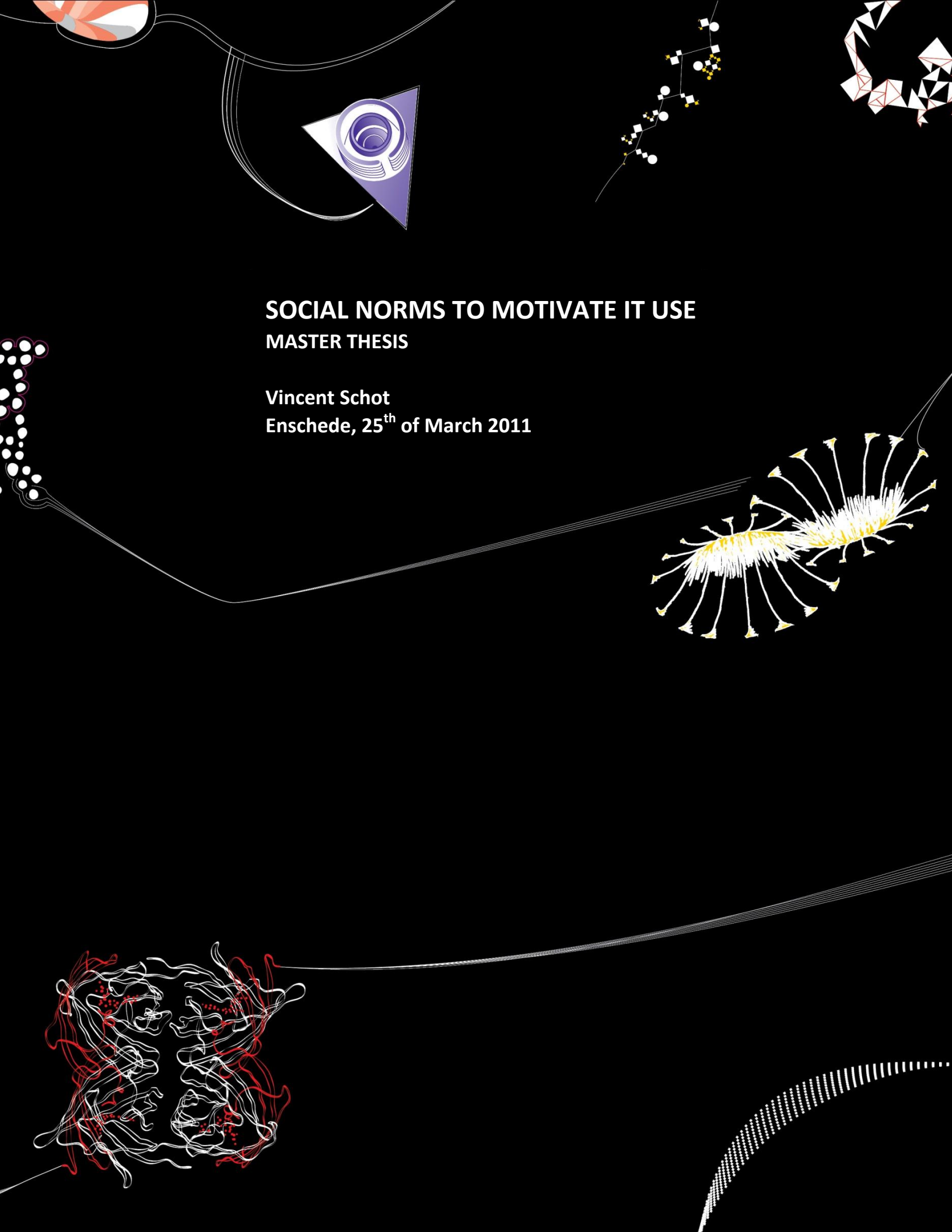

SOCIAL NORMS TO MOTIVATE IT USE

MASTER THESIS

Vincent Schot

Enschede, 25th of March 2011

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MASTER THESIS VINCENT SCHOT

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Summary

Current IT implementations do not realize the expected benefits. One of the major barriers for realizing these benefits are low adoption and underutilization of newly implemented IT systems. There are little effective interventions known that can increase these problematic IT adoption rates. In this study it is explored whether it is possible to design and develop interventions that can help practitioners.

Scholars have shown the power of social norm interventions to guide and influence a wide variety of human behaviors. Social norm interventions are used to influence behaviors such as littering, hotel room towel re-use, voting, wood theft, energy consumption, drinking and curbside recycling. So far it was unknown whether these findings can be replicated in an IT setting. If this is the case, the use of social norms might provide an important key for improving current problematic IT system adoption rates

The aim of this research was to empirically verify whether social norms can influence IT usage behavior. This serves two purposes:

1) Extending current literature on social norms and IT acceptance by researching whether social norms influence IT usage behavior.
2) Developing an organizational intervention that can be used by IT practitioners. This intervention needs to be empirically tested to proof its usefulness

There are two important types of social norms: descriptive norms and subjective norms. Descriptive norms refer to the perception of what is commonly done by others in a given situation. Subjective norms refer to the approval or disapproval of important others in engaging in certain behavior. These two perceptions are important motivators of human behavior.

Normative feedback interventions use those social norm mechanisms to deliberately influence human behavior. People are made aware of their deviation from the norm. Subsequently, people will correct their behavior to converge towards the norm. Reported studies on normative feedback interventions allowed us to develop a generic design for an organizational intervention. The design consists of five steps: (1) define IT usage, (2) determine baseline, (3) develop descriptive norm, (4) personalize messages and (5) communicate the norm.

I conducted a field experiment to empirically verify a normative feedback intervention for IT use. The experiment aimed to increase the use of a voluntary IT system in a Big Four company. Participants were randomly assigned to an intervention or control group. The intervention group received a normative feedback e-mail that compared their peer usage (descriptive norms) with their own usage behavior. The control group received a similar e-mail without normative feedback.

The results confirmed that social norms do stimulate the individual use of IT. The intervention group outperformed the control group (35% versus 21%). These results are statistically significant with a reliability of 95% (alpha = 0,05). This effect is in line with the earlier reported social norm interventions in social psychology.

Within the results there were notable differences among two subgroups. Prior to the experiment one subgroup had a favorable descriptive norm (61%) towards using the voluntary system, while the other subgroup had not (17%). The result of the intervention group with the favorable descriptive norm (52%) is substantial larger than the effect for the other intervention group (29%).

The main conclusion of my research is that social norms influence IT use. With a well-designed e-mail, it is possible to activate the norm mechanisms to motivate the use of a voluntary IT system in a Big Four company. The e-mail contained two descriptive norms with the alignment of the appropriate subjective norm. The e-mail led to the fact that 35% of the intervention group used the system.

I could explain the subgroup differences with the actual behavior of *similar peers*. It seems that the behavior of similar peers moderates the effect size of a social norm intervention. The intervention was more likely to motivate an individual if there were more similar peers in his environment that already use the system. I mentioned three similar colleagues that were using the system for each receiver of the normative feedback e-mail. The quality or similarity of these names did not predict or explain the results itself. I assume that mentioning these colleagues led to the fact that people verify the norm in reality. This is corroborated by the fact that there is a linear correlation between the intervention success and the amount of similar peers in the environment of a person.

Further, the field experiment validated the organizational intervention of the generic design mentioned above. Therefore, I can conclude that this generic design can be used by practitioners to develop their own interventions in order to increase IT adoption rates.

This study has two important limitations. The first limitation is the rather narrow definition of IT use. IT use in this study referred to updating a profile with resume on a portfolio tool. This definition does not incorporate repeated use or use on a daily basis. The second limitation is that this study is not longitudinal. I do not know what the effects of social norm interventions are for a longer time span. Norms and norm activation need repetition and time to become more prevalent. So it is hard to generalize to arbitrary IT use, but the experiment has proven that normative feedback interventions in an IT setting can give significant results. This result also has implications for the theory of IT acceptance. Evidence from literature as well as this study suggests that descriptive norms should be considered in IT acceptance models. To that end, I propose an update of the so-called TAM2 model for IT acceptance.

Preface

This master thesis marks the end of my student career which I enjoyed in many ways. During the project I realized how many I have learned in the last five and half years. Many skills were necessary to successfully complete this project. Aspects such as statistics, research methodologies and critical thinking, but also listening, discussing and intuition were important to me.

Maybe the most important result of this project is not the master thesis itself. During this project I realized where my passion lies. I felt: “I want to do more projects like this”. My project focused on people and their behavior in IT settings. Why do people want to use an IT system? Why are some using the system while others are not? These questions about human behavior puzzle which intrigue me. I hope to explore, consult and advice organizations on these kind of puzzles in the future.

Obviously, this project would not have been successful as it has been without the support of the people involved. First of all, I would like to thank Jeroen van Dalen. He supported me throughout the process as a critical follower and friend. We had an ongoing discussion about this study for nearly six months during birthdays, phone calls and other social events that contributed greatly to the quality of this master thesis.

I also want to express my gratitude to my supervisors Christiaan Katsma, Klaas Sikkel en Maarten Wilpshaar. Christiaan en Klaas guided the process as university supervisors. Whenever I felt that I had “major breakthrough” in the research process they welcomed my ideas and were prepared to discuss them with me. In such a situation, Christiaan kept on asking questions to delve a bit deeper and thereby helped to generate new thoughts. Klaas challenged my ideas throughout the process. Their combined support and probing questioning allows me to present you a coherent story with academic quality. Maarten was my company supervisor at KPMG. Without him it had not been possible to carry out my research in such a large company. He ensured that I felt at ease and generated the opportunities that shaped the research in manifold ways.

Apart from the people directly involved in the process of my thesis, I would like to thank my girlfriend, family and friends for their support and the many joyful moments we shared in the past months. Special thanks go out to my parents for their care, attention and love. They always stimulated me to think and discuss ideas openly.

I hope you all enjoy reading this master thesis and benefit from the content. If you have any questions or comments do not hesitate to contact me. I will be happy to help you whenever I can.

Best regards,

Vincent Schot

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PART III - DESIGN OF AN ORGANIZATONAL INTERVENTON

PART IV - RESULTS AND CONCLUSIONS

PART V - APPENDICES

Part I: Research Introduction

1 Introduction

80% of the people that read this thesis enjoyed reading it. After you finished reading this master thesis, you will know two things: that the first sentence is, of course, true, but more importantly, why this sentence is very powerful and how you can use that power yourself. As we will see later on, this sentence describes a fundamental mechanism of human behavior. The topic of this master thesis is people and their use of IT. The reason that I choose this topic is because I am interested in the behavior of people and how their behavior is influenced. And as a Business & IT master student, it is exciting to know how people are motivated to *use* IT systems.

But why are IT systems important? IT systems are central to many organizations nowadays. Important business processes are supported by systems such as CRM, ERP and MIS systems. Large organizations have countless IT systems. But, how do you know which system to use? And for managers and decision makers, how do you stimulate your people to use the critical system you just invested several millions in? The same and other questions hold for smaller organizations: How do you get people to abandon their old habits? Imagine that your just replaced your old paper-based form handling with an electronic system. Some of your employees retain the paper-based form handling. Is there a way to trigger them to use the system?

The questions above motivate the relevance of this study. In this study I zoom in on the behavior of users that use IT systems. And in particular I want to answer the following question: How can we encourage people to use IT systems? A critical person could say: “why should you stimulate people anyway? If the system is good people will use it”. This is true of course, but reality is far from perfect. Many systems are hard to use or we need to spend time to learn it. Therefore, I consider an IT system as a magical black box that can be good or a bit worse. We cannot change its properties, but we want that people are engaged in using this magical black box.

Our question still yields many possible answers. Human behavior is very complex; many factors can trigger and contribute to IT use. The motivator of interest in this study is social influence. Social influence occurs when one’s thoughts or behavior is affected by someone else. Social influence often occurs via *social norms*. Social norms are implicit shared rules that enable or constrain behavior in groups. We are all familiar with the social norms to be quiet in a church and library or to dress properly for a funeral and wedding. How would you dress for a wedding? I bet you were just thinking about a suit or a dress. No one forced you to do so and I didn’t mention those upfront, but our societal norms probably did influence your thoughts on this topic. But, what do those norms have to do with IT use?

This particular study is inspired by studies of Cialdini and his colleagues. They demonstrated the strength of social norm interventions to influence behavior. In this case I do not mean the societal norms as the library or a wedding, but using or creating particular norms to influence behavior. The most striking example is that of hotel towel re-use. A large hotel chain in the US faced the problem that most of their hotel guests did not re-use their towels. Along with his colleagues, Cialdini demonstrated that they could increase the towel re-use rate with 33% in the whole chain. This result was possible with only changing the text on a door hanger! How is this possible? The short answer: social norms.

The question now is: To what extent are hotel towel re-use and IT use comparable? Do social norms also influence IT use? My girlfriend hinted at a possible answer to these questions. While I was in the middle of this study, she told me she started using the popular social network site FaceBook. When she was telling me this, I was very curious what motivated her to do so. After all, I was researching why individuals start to use certain IT systems.. I decided to just ask her straight away: "Why did you start using FaceBook?" I hoped she could provide at least an explanation, as many times we just *act.* She frowned a bit and answered immediately after: "Why do you bother asking? *Everyone* is using it!" Her response indicated an answer which was self-evident to her, but also perfectly hits the core of this study. Adopting FaceBook was motivated by the fact that other people were using it. Cialdini motivated towel re-use in a similar way. In this master thesis I want to find out if this is a structural property of IT use. Can I develop a similar social norm intervention as Cialdini to motivate IT use? Will this intervention hold in an organizational setting? I invite you to read this master thesis and find out.

This master thesis is structured in four parts. The first part provides an overview of the research. The remainder of Part I contains the following sections:

- Background
- Research Questions
- Research Design
- Research Overview

The other parts (II, III and IV) are structured based upon my research questions. I detail the structure of the remaining parts at the end of Part I.

2 Background

Current IT implementations do not realize the expected benefits (Jasperson et al., 2005). IT investments often promise more efficiency and effectiveness, but actually increase cost. A major problem to realize these benefits is the low adoption rate of implemented IT systems. If individual users do not use the system, the expected benefits such as gains in efficiency, effectiveness or productivity cannot be realized. It is suggested that low adoption and underutilization are major barriers for successful IT implementations (Devaraj & Kohli, 2003). As IT systems are becoming more complex and central to the enterprise, the problem is getting more severe (Venkatesh & Bala, 2008). Therefore, it is important that effective *interventions* are developed and tested that stimulate individuals IT adoption and use (Venkatesh & Bala, 2008; Jasperson et al., 2005).

Social psychology studies focus on change in attitudes and behavior. Research in this domain demonstrated that one particular successful strategy for changing behavior is social norm activation (Schultz, 1999). Social norms can be defined as: "[social] norms are sets of beliefs about what other people are doing or what they approve or disapprove" (Cialdini et al., 1990). Social norms guide human behavior and provide a source for intervention development. Norm interventions have successfully influenced a wide range of behaviors, such as hotel room towel re-use (Goldstein et al., 2007), littering (Cialdini et al., 1991), home energy consumption (Schultz et al., 2007), voting (Gerber & Rogers, 2009), theft of wood pieces (Cialdini, 2003) and drinking behavior (Neighbors, 2006). In these interventions people are presented normative information about the behavior of others. People seem to conform to their beliefs about what others do in a given situation. The beliefs of what others do in a common situation are referred to as *descriptive norms* (Cialdini et al., 1991). These descriptive norms can be influenced or altered through the presentation of normative messages. The other type of norms is *injunctive norms* (Cialdini, 1991). Injunctive norms refer to the perception of what others approve. Combining injunctive and descriptive norms further strengthens the effect of social norm interventions (Schultz et al., 2007).

These social norm interventions seem appealing to increase the low IT adoption rates. However, unknown is if the effects of social norms can be extrapolated to IT use. To the best of my knowledge no studies document the use of a descriptive norms approach to stimulate IT use. Only Hsu and Lu (2004) have shown that *perceived critical mass* affects online gaming decision of teenagers. Their study strengthens my idea that descriptive norms indeed affect IT use. But, this still does not proof that a social norm intervention would actually increase IT use. The opposite effect might even take place. Social norm interventions backfire in cases when the actual norm is not to perform the desired behavior (Goldstein et al., 2007). The reported low adoption rates of IT systems suggest that IT use risks this backfiring as well, as the majority is not using the IT system in these cases.

Furthermore, the current explanations of IT adoption do not include descriptive norms as a predictor of IT use. IT adoption and IT use are studied in the field of IT acceptance. The most-widely known and employed model for IT acceptance is the Technology Acceptance Model (TAM) (Davis et al., 1989). The TAM model suggests that the construct *attitude* predicts the *behavioral intention* to use an IT system. Behavioral intention in turn predicts a*ctual system use*. The model predicts about 50-55% of the

variance (Venkatesh, 2000; Venkatesh & Davis, 2002). This model does not include social influence as a predictor of IT use. Venkatesh & Davis (2002) proposed the TAM2 model to make up for this. They included *subjective norm* to account for social influence. Subjective norms are similar to injunctive norms (Minton & Rose, 1997) and refer to approval of important others. The addition of subjective norm allowed for explaining additional variance (5-10%). The TAM studies did not include descriptive norms.

Another issue with TAM2 is that social influence lacks predictability in voluntary IT situations (Schepers & Wetzel 2007). The introduction of subjective norm led to explaining additional variance, but *not* in voluntary situations. Attitude predicted IT use in these cases best. This weak relationship questions if a social norm approach works in voluntary IT settings. Yet, the reported behaviors in the social norms literature are all voluntary (e.g. auto purchase, littering or energy consumption). With this in mind, it seems intuitively strange that IT use is not motivated by social influence in voluntary situations. In sum, TAM(2) highlight some of the issues with a social norms approach for improving IT use. TAM states that IT use is predicted by social norms, but does not include descriptive norms. Also social norms do not seem to predict IT use in voluntary situations.

The above discussion leads to the idea of testing the effect of social norms in a voluntary IT setting. I designed a field experiment to verify if social norm interventions could stimulate IT use. The experiment consisted of an intervention to increase the use of a specific voluntary IT system in a Big Four company. The experiment should make it possible to proof that social norms also operate in voluntary IT settings. And hence, learn us about social norms as predictor for IT use. In addition, the results can be used to improve the current IT acceptance literature. Last but not least, if this intervention proofs successful, this study can be used by managers to fight the strikingly low IT adoption rates.

2.1 Problem statement

Scholars have shown the power of social norm interventions to guide and influence a wide variety of human behaviors (Gerber & Rogers, 2009). Unknown is if these findings can be replicated in an IT setting. If this is the case, the current problematic IT system adoption rates can be improved.

Current literature does not explicitly address social norm interventions for IT use. First, no studies document that social norms interventions encourage IT use. Second, neither TAM nor TAM2 do include descriptive norms as predictor of IT use (Venkatesh et al., 2002). This is problematic as social norm interventions rely on descriptive norms. Third, social influence is a weak predictor of system use in voluntary IT usage situations (Schepers & Wetzel, 2007). This questions the applicability of social norm intervention for voluntary IT settings.

In this study I want to empirically verify if social norm interventions can improve IT adoption and use. These findings could extend the current research on social norm interventions. Furthermore, it will give insights to what extent social norms play a role in IT adoption and use. The results can hint in possible new directions for theory generation. Finally, this study can guide practitioners in the effective use of social norm mechanism for motivating IT usage.

3 Research

This chapter contains the research outline. First, I pose the main research question and describe the sub questions. Second, I point out why this research is relevant and what can be expected in terms of theoretical and practical contributions. The third part of this chapter details the research design. I discuss research approach and method.

3.1 Research Question(s)

The above discussion and problem statement leads us to the following main research question:

- *What is effective use of social norms in an organizational intervention for increasing individual user acceptance of IT systems?*

This main question is divided into the following sub questions:

1. *What explains the behavior of individuals' user acceptance and usage of IT systems?*
2. *What is the influence of social norms on human behavior?*
3. *How can social norms be used in an organizational intervention to increase individual acceptance of an IT system?*
4. *What is the effect of an organizational intervention that uses social norms to increase individual user acceptance of an IT system?*

3.2 Research Relevance

The research project has the following expected contributions for theory and practice:

1. Extending current literature on social norm interventions. Can the reported findings be replicated in an IT setting? Are there structural difference between reported behaviors such as hotel room towel re-use and IT use? (Theory)
2. Assessing the impact of social norms (descriptive norm, subjective norm) on IT use. I explore the impact of this study for current knowledge on IT acceptance. This could help to further guide IT acceptance models and studies. (Theory)
3. Giving concrete recommendations to managers and practitioners on how to intervene effectively in IT/IS implementations using social norm. (Practice)

3.3 Research Design

The research contains two parts: (1) literature study and (2) field experiment. In the first part I explore our current understanding on IT acceptance and social norms and their mutual relationship. This is based on literature in the domains of social psychology, information systems and IT acceptance. In the second phase I want to apply and test a model derived from the literature study in a field experiment. The empirical case of interest is the acceptance of a voluntary IT-system at a Big Four firm. The units of study are all the IT advisory consultants in this company. An overview of the field experiment is given below in 3.3.1 and 3.3.2. In 3.3.3 I discuss possible outcomes and measurement.

3.3.1 Example of prior field experiment

There are many studies (field experiments) in social psychology that explore the use and manipulation of social norms to reach desired behavior. Examples are: increasing condom use, re-using towels and using less electricity in households. In these studies the social norms (combinations of descriptive and injunctive norms) are communicated in writing to the participants. The changes in behavior of the target group are measured afterwards. To create an organizational intervention that employs the social norm, I want to replicate these studies in such a way that they can be used in the context of an IT system.

To illustrate the dynamics I will briefly discuss a case where a social norm is used to motivate certain behavior. Goldstein et al. (2008) wanted to raise the re-use rate of towels in a large hotel chain. The hotel chain usually hangs a towel reuse sign at each door with the message:

> *"Help save the environment. You can show your respect for nature and help save the environment by re-using your towels during your stay".*

The message above focuses on the importance of environmental protection but does not contain any normative information. Goldstein et al. (2008) developed a new normative message for the reuse sign. This message included a normative description:

> "*Join your fellow guests in helping to save the environment. 75% of the guest participated in this program by using their towels more than onc*e".

This message caused an increase of 33% towel re-use in comparison to the regular message. Furthermore, when they changed the re-use sign to reflect that people who stayed in the *same* room re-used their towel, the re-use rate increased even a bit more. This finding is consistent with the fact that people tend to better conform to normative messages when the perceived similarity or closeness is higher.

3.3.2 Field experiment motivating IT acceptance

I want to do a similar field experiment as Goldstein et al. (2008) to study the usage of IT systems. The setting of the field experiment is a large consulting and auditing firm. Recently a new IT portal system has been launched. The system is available through intranet. The system is a business person's portfolio tool. Each person is expected to create a portfolio page in the system and update this regularly. The system can also be used to find relevant information about colleagues. The system usage is low and the acceptance is not assessed yet. The management would like to increase the usage of the systems.

The Big Four company is managed in a partnership structure. The target group of the field experiment contains consultants within the particular IT advisory partnership. The total amount of people within this target group is about 260. The partnership is divided in several groups such as sourcing, architecture and strategy. The use of the system differs between these groups. The system was introduced in two central meetings (PowerPoint presentations) and some general e-mails. All consultants are expected to have similar knowledge about the presence and functionality of the system.

In the field experiment I want to study whether it is possible to increase the usage of the system by presenting some of the consultants a normative message. For this experiment I created two messages. The first message will be a regular message that informs about the presence of the new system and invites people to use it. The second message was a normative message that contained usage information. This second message could have several variations:

- Usage behavior of the systems within other departments within the company
  (Example given: 60% of the people within the auditing partnership use the portfolio tool on a daily basis);

- Usage behavior of other groups within IT advisory
  (Example given: At the Groups sourcing and strategy 70% uses the portfolio tool on a daily basis);

- Usage behavior of individuals within groups
  (Example given: Consultant Rob uses the system on a daily basis and scores 10% more quotations);

- Usage behavior of KM and portfolio systems at comparable companies
  (Example given: At Big Four Company A and Big Four Company B, more than 70% of the people use portfolio tools on a daily basis).

The groups within the IT advisory group are randomly assigned to the regular or the normative message. The sender of the e-mail was the responsible manager. Guadagno and Cialdini (2002) demonstrated that sending a persuasive message either by regular mail or via an online medium does not yield substantial differences in outcome for males. The decision to use a senior manager or a responsible partner as the proposed sender of the message has several reasons: (1) the message comes from within the company itself as it should feel as an internal normative message. (2) The ultimate goal of the experiment is to

study an intervention which will typically come from a manager. (3) This automatically adds an injunctive part to the message: the manager “approves” the use of the system.

Both social psychology experiments (Forward, 2009; Goldstein et al., 2008; White, Smith, Terry, Greenslade, & McKimmie, 2009) and the TAM model suggest that an increase of normative beliefs should lead to an increase in both intention and actual usage. This literature even predicts an increase of about 25% in desired behavior. Therefore, I hypothesize and predict that my intervention will also lead to a similar increase as in the reported studies. The field experiment in this study has to validate this prediction.

3.4 Research Overview

In this Part I of my master thesis, I derived a central question and sub questions. The central question to be answered is:

> *What is effective use of social norms in an organizational intervention for increasing individual user acceptance of IT systems?*

Subsequently, I discussed my approach inspired by discussed field experiments and ideas behind them to answering this question. The next step is to provide an overview of the research and the structure of this master thesis.

Table 1 shows an overview of the structure of the thesis. It allocates the sub-questions to various parts, and indicates the used methodology and outcome. Part II contains chapters which discuss my literature study and provide answers for research sub-question (1) and (2). Subsequently, in Part III, the focus is on designing my own intervention based on the insights gained in the previous part. I discuss the use of social norms in interventions (sub-question 3). The set-up of the field experiment is detailed in the last chapter of this part. In part IV, I present the results of the field experiment, and answer the last research sub-question (4).

Research Question	**Methodology**	**Outcome**
Part II: Current insights from literature		
1. What explains the behavior of individuals' user acceptance and usage of IT systems?	Literature Study	Description of IT acceptance from the literature. (TRA, TPB, TAM1, TAM2, TAM3)
2. What is the influence of social norms on human behavior?	Literature Study	Description of social norms and documented interventions. Analysis of intervention suitability for IT use.
Part III: Design of a generic field experiment		
3. How can social norms be used in an organizational intervention to increase individual acceptance of an IT system?	Literature Study	Complete research design. Based on (1) and (2) a complete research design with procedure for the field experiment.
Part IV: Results and conclusions		
4. What is the effect of the proposed intervention on IT acceptance and usage behavior?	Field Experiment	A set of (validated) relationships between social norms and IT acceptance

Table 1: Research overview

Part II: Current insights on IT acceptance and social norms

4 IT acceptance and usage

This part aims to provide an answer to my first two sub-research questions. It examines current insights reported in the literature on IT acceptance on social norms and IT acceptance. I deliberately start discussing IT acceptance and usage behavior before digging deeper in social norms and norm interventions literature. It is easier to think about norms when we are already familiar with the target behavior of this study. After all, IT usage is the behavior I want to influence by using social norms. In addition, I can apply the lessons learned from social norm interventions to IT usage directly afterwards.

The first research question about IT acceptance is the leading question in this chapter:

> *"What explains the behavior of individuals' user acceptance and usage of IT systems?"*

To answer this question, I draw upon the IT acceptance literature. The Technology Acceptance Model (TAM) (Davis, 1989) is one of the better known models for the use of technology and in particular IT systems. Over the last decades, scholars have been using TAM to study factors that influence individual user acceptance. The goal of these studies is not only to understand acceptance, but also to enhance actual system usage (Schepers & Wetzel, 2007). I also explore TAM, not only to understand which factors determine the usage behavior of IT, but also to identify possible problems and difficulties generated by the use of this model.

The chapter itself has the following structure. I start with the description of the predecessors of TAM in behavioral science. Understanding these models and their constructs is necessary to explain why people use or not use IT systems. Subsequently, I extensively discuss TAM and its possible extensions. At the end of this chapter some of the current complications with TAM are highlighted. This discussion is a prelude to the literature on social norms in the coming chapters.

4.1 Theory of Reasoned Action

Before we can understand TAM, we need to go back to the roots of this model in social psychology. The basis for TAM and many other acceptance models is the Theory of Reasoned Action (TRA) by Fishbein & Ajzen (1975). This theory provides a model that can be used to measure and predict human behavior. According to the authors, each behavior has a target and an action (Kowalcyk, 2008). In the context of an experiment in IT use the target would be the *IT system* and the action would be *using* it.

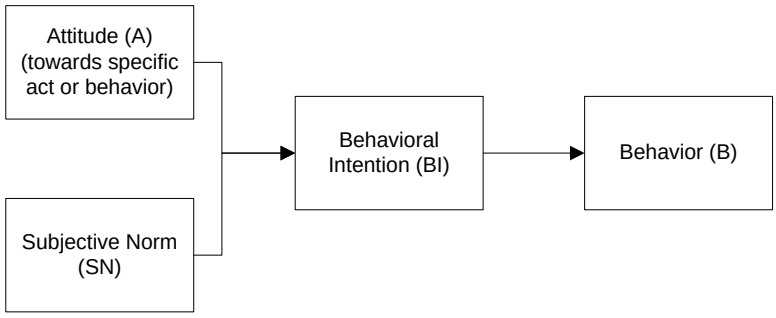

Figure 1: TRA model (Source: Fishbein and Ajzen (1975))

Figure 1 depicts the TRA model and has a total of four constructs. The TRA model suggests that behavior (B) is determined by the intention of someone to perform that behavior (BI). The behavioral intention of someone is determined by two constructs: attitude (A) and subjective norm (SN). Attitude is defined as the sum of personal beliefs about the consequences of certain behavior and the evaluation of those consequences. Attitudinal beliefs are thoughts about performing the specific behavior. Subjective norm concerns normative beliefs. Normative beliefs are about what important others think of certain behavior and the willingness to comply with their beliefs.

I give a brief example to make the TRA model and the constructs more clear: TRA could be used to explain the behavior of somebody going to the gym. The *intention* to actually go to the gym would be determined by *attitude* and *subjective norm*. Attitude could consist of beliefs such as: "When I go to the gym I lose calories. Losing calories is good" or "going to the gym makes me tired". Behavioral beliefs concerning the subjective norm could be positive thoughts of your friends who are also going to the gym ("*Jim likes working out. He also likes when I join him for the spinning hour*"*)* or the thoughts of a spouse who prefers that his/her husband is staying home ("*My wife/man doesn't like when I leave at the evenings, I'm already gone for the whole day*"). The combination of the attitudinal and normative beliefs would determine the intention to go the gym while the intention would predict the actual behavior.

The above example showed how attitude, subjective norm and intention guide behavior. But, there are several important qualifying remarks to make about the TRA model. The TRA model asserts that the only direct predictive variables are intention, attitude and subjective norm (Kowalcyk, 2008). This implies that this model moderates all other factor and influences (Davis, 1989). Further, the relative weighting of subjective norm and attitude differs per behavior and social context. In the example: the subjective norm may be more important for going to the gym than for using a specific supermarket for grocery shopping. Hartwick and Barki (1994) have shown that the relative importance of attitude is higher for non-mandatory behavior, while normative beliefs are relative more important for mandatory behavior. Especially the importance of subjective norm in mandatory settings has consequences for the individual user acceptance of IT and will be further discussed in section 4.3 about TAM.

4.2 Theory of Planned Behavior

Icek Ajzen (1991) introduced the Theory of Planned Behavior (TPB) as an extension of TRA. The extension was needed to account for the fact that sometimes performing certain behavior falls out of somebody's will or ability. For example: somebody can have a mental disorder which alters the behavior patterns. These types of exceptions could not be explained with the TRA model. Therefore, the TPB model includes one more construct: *perceived behavioral control*. Miller (2005) described the extension as: "This extension involves the addition of one major predictor, perceived behavioral control, to the model. This addition was made to account for times when people have the intention of carrying out a behavior, but the actual behavior is thwarted because they lack confidence or control over behavior".

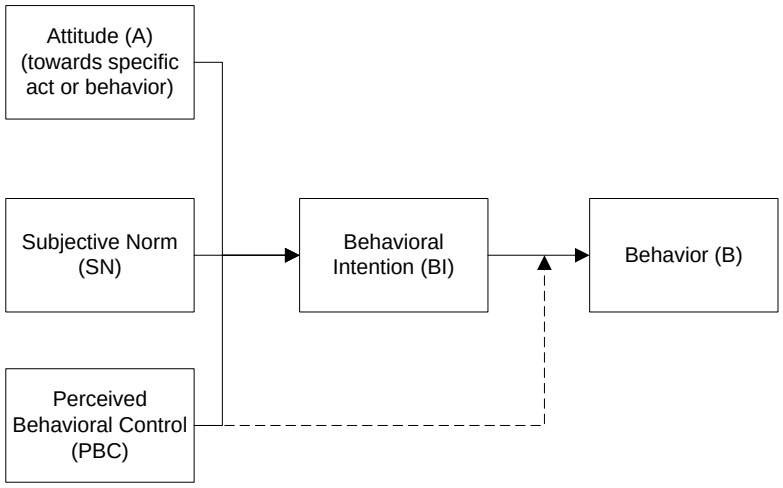

Figure 2: The Theory of Planned Behavior (Source: Ajzen, 1991)

Figure 2 depicts the TPB. Human action is guided by three types of considerations: *behavioral beliefs*, *normative beliefs* and *control beliefs*. Behavioral and normative beliefs were already included in TRA. Behavioral beliefs capture thoughts and evaluation about the specific behavior and produce an attitude. Normative beliefs results in perceived social pressure and are captured by subjective norm. Control beliefs are the perceived ability of someone to carry out the behavior. These control beliefs are new in the model in comparison to the TRA model. The combination of attitude, subjective norm and the PBC results in the motivation or intention to engage in the given behavior. As a general rule, the more favorable the attitude and subjective norm, and the greater perceived behavioral control, the stronger one's intention to engage in the behavior (Ajzen, 2002). Finally, the greater one's intention, the more likely the person is to perform the behavior. The dotted line in the figure is described by Norman et al. (2005): "Ajzen (1988) argued that when people are accurate in their perceptions of control, perceived behavioral control (PBC) should also have a direct influence on behavior independent of the influence of intention".

The introduction of control beliefs was especially helpful for the prediction and explanation for healthcare behaviors (Armitage & Connor, 2001). Why are TRA and TPB good models for explaining human behavior? The strength of both TRA and TPB is that it includes social influence processes in the form of subjective norm to predict behavior. Hereby the models can account for decisions and behavior that are not in line with one's personal opinion or attitude. This link is missing in more basic explanations model that only link attitude and behavior. However, there are some problems with the conceptualization of social influence that yield implications for the TPB model (Rivis & Sheeran, 2003). These implications will be discussed after the discussion of TAM in the next section, because the implications also hold for TAM.

4.3 Technology Acceptance Model

The Technology Acceptance Model (TAM) has been introduced by Davis (1989). The purpose of TAM is to provide a model for the acceptance and usage of a particular information (or IT) system. The foundation for TAM lies in the TRA/TPB models. TAM can be seen as a specific version of TRA to predict the behavior of system usage. The TAM model is depicted in Figure 3. Davis (1989) only used attitudinal beliefs in TAM. This means that the normative beliefs and its construct subject norm are discarded in TAM. During the construction of the model it seemed that the subjective norm did not explain any additional variance of the behavioral intention construct (BI). The original links between attitude, behavioral intention and behavior remain the same in TAM.

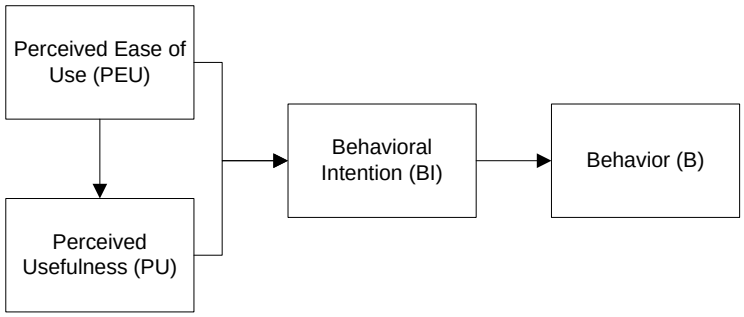

Figure 3: Original TAM model (Source: Davis, 1989)

TAM posits that the attitude for using a system can be captured by the two constructs *Perceived Usefulness (PU)* and *Perceived Ease of Use (PEU). Perceived Usefulness* refers to the degree that a certain person beliefs that using the IT system has a positive effect on his job or work. Davis (1989) defines this as: "the degree to which a person beliefs that using a particular system would enhance his job performance". The usefulness is measured with questionnaire items on a Likert scale: "The system improves the quality of my work" and "The system improves the speed of my work".

Perceived Ease of Use refers to the degree a certain person beliefs that using the system is easy. Davis (1989) defines: "the degree to which a person beliefs that using a particular system is free of effort". As a general rule, the greater the constructs perceived ease of use and usefulness, the greater the intention to use the system. Further, if a person beliefs that a system is easier to use, he/she also beliefs that its usefulness is higher.

The original TAM model explains typically about 40-50%% of the variance (Venkatesh et al., 2000). Venkatesh & Davis (2000) introduced TAM2 to increase the predictive power of the model. They included some additional key determinants in TAM. These additional determinants allow explaining some of the limitations of the original TAM model. For example, Hartwick & Barki (1994) demonstrated a significant difference between mandatory and voluntary usage behaviors. This difference cannot sufficiently be explained with the original TAM model and only the behavioral beliefs.

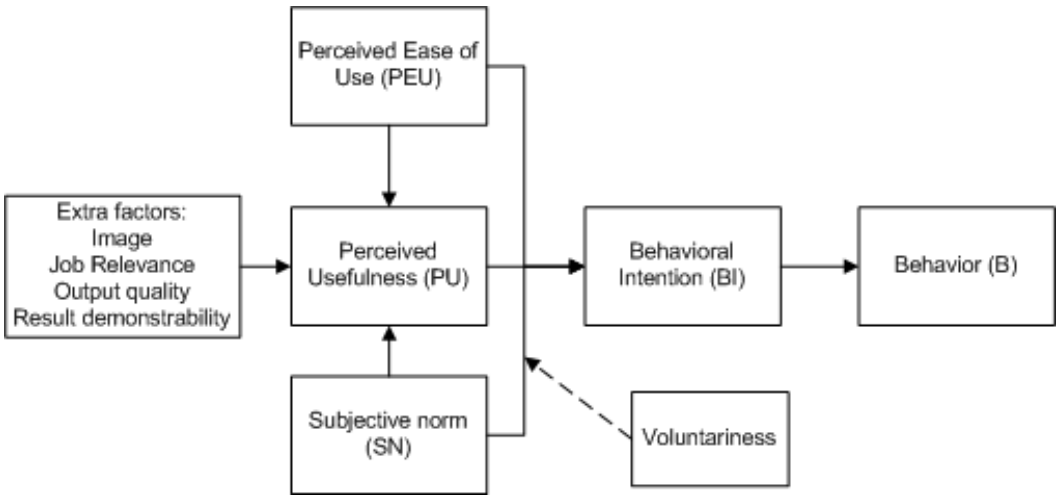

Figure 4: The TAM2 model (Source: Venkatesh & Davis (2000))

Figure 4 depicts the TAM2 model. Venkatesh & Davis included two groups of constructs: social influence processes (subjective norm, voluntariness, image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use). The cognitive instrumental processes explain how perceived usefulness is constructed and determined. The most interesting addition in TAM 2 is the inclusion of the subjective norm. Here the authors follow TRA and TPB which also include the subjective norm. This is the only new factor that directly affects intention (similar to PEU and PU). The subjective norm represents, similar as in TRA and TPB, the fact that people can intent to use a system to comply with the group or important others even if they have a less favorable attitude towards the system. Voluntariness is incorporated as a moderating factor as a result of the study by Harwick & Barki (1994) and further validated in research by Brown (2002). Furthermore, there is also an *indirect* relationship between subjective norm and behavioral intention. The subjective norm also influences perceived usefulness. This captures the mechanism that: "*If Joe uses the system, it should to some extend be useful or else he wouldn't use it*".

The validation of TAM2 demonstrated that especially the subjective norm indeed added predictive power to the model and especially in non-mandatory situations. One could say that the TAM model converged to its predecessor TRA and TPB with the inclusion of the subjective norm. TAM2 demonstrated that individual user acceptance of IT systems can be explained by the behavioral intention to use a system which in turn is determined by perceived usefulness, perceived ease of use and subjective norm.

4.4 Problems with subjective norm in TAM

Many studies replicated TAM(2) to explain and predict IT usage intention, but, in these studies, contrary to the original one, the role of subjective norm was mixed and inconclusive (Schepers & Wetzels, 2007). Schepers & Wetzels (2007) did a meta-analysis of subjective norm and its moderation effects in TAM studies. As expected, they found the effect of subjective norm predicting perceived usefulness and intention, but only in mandatory settings. In voluntary settings the relationship between subjective norm and behavioral intention turned out to be weak. How can we explain this?

The gym example given earlier certainly qualifies as voluntary behavior. Is there no or only very weak social influence in the cases of voluntary behavior? Recent advancement in social psychology can help us to answer this question. As we know by now, TAM has its roots in the TRA and TPB model. Also in other TPB studies, it has been shown that the subjective norm-intention relationship can be quite weak (Armitage & Connor, 2001). The explanation for this weak subjective norm-intention relationship has to do with the narrow conceptualization of social influences (Rivis, 2003). The literature on social influence and social norms suggests an important distinction between injunctive norms ("what important others think a person *should* do") and descriptive norms ("what others are doing") (Cialdini & Kallgren & Reno, 1991). The construct subjective norm used in TAM studies focuses mainly on injunctive norms since it refers to approval of important others. This is referred to as *normative* influence. The origin of the influence of a descriptive norm is different. It is an *informational* influence: "if everyone is doing it, then it must be the sensible thing to do" (Cialdini et al., 1991). In the social psychological literature on social influence, it is argued that precisely these descriptive norms predict behavioral intention in all kinds of voluntary settings such as speeding, eating and going to the gym (Gerber & Rogers, 2009).

The combination of the above discussed problem of seemingly weak direct relationship between behavioral intention to use IT systems and the subjective norm in voluntary settings, and the suggestion done in the social psychological literature about the importance of descriptive norms was the focal point for my own field experiment. It felt intuitively strange that social influence is weak in voluntary IT situations as it predicts many other voluntary behaviors very well. Furthermore, it was clear to me that the role is of descriptive norms might solve this puzzle. I will continue the discussion of the role of social influence and social norms for IT acceptance when I know the effects of my proposed field experiment. Hopefully, these results provide insights which solve the puzzle.

This chapter highlighted the components which predict IT use (perceived usefulness, perceived ease of use and subjective norm). It pointed at a as of yet unresolved issue related to the importance of social influence in voluntary settings. Before we proceed to the experiment, we first delve a bit deeper into the literature on social norms with the aim to improve our understanding of their influence.

5 Social norms

In the previous chapter we have seen that human behavior, and in particular the use of IT systems, can be explained by several factors. One of them is the subjective norm. A subjective norm accounts for social influence. But what is social influence? How does social influence translate in social norms? And, especially: (How) can social norms be used to leverage and influence desired behavior? This chapter explores possible answers for these questions to answer the second research question of this study. The second research question is:

> *"What is the influence of social norms on human behavior?"*

The goal of the proposed exploration of social norms in this chapter is to understand the concept and the underlying mechanisms. This exploration will not answer the above second research question as a whole. For this answer I need to combine this chapter and the next chapter. In the next chapter, I more specifically look at how I can use the mechanisms ourselves to intervene in ongoing processes. But, first we need to learn and understand those mechanisms. Our exploration of social influence and social norms starts in the next section.

5.1 Social influence and social norms

Human are social animals. We live in groups and these groups provide a context for our thoughts and actions. Behavior of humans is strongly influenced by the behavior of other humans (Aarts & Dijksterhuis, 2003). When thoughts or actions of an individual are influenced by others, we refer to this as a process of *social influence*. Influence of others can refer to both individuals and groups. Fehr (2004) describe human societies as groups that are known for their large-scale cooperation. For this large scale cooperation to succeed, certain behavior is beneficial for the group. Behavior of individuals within the group is affected through *social influence* processes. For the sake of the group it is beneficial if through these *social influence* processes individual behavior is aligned with group interests. This alignment is possible with *social norms*.

Social norms are standards of behavior that are based on widely shared beliefs of how members of a certain group *ought* to behave (Fehr, 2004). These standards for behavior are understood by all group members. Social norms constrain behavior without the force of laws (Cialdini & Trost, 1998). This means that norms are sanctioned informally and socially. Members of a group who comply consistently with the normative standards receive greater acceptance and approval than people who deviate (Turner, 1991). The definition of social norms also implies that norms are always specific to a focal group. Norms can apply to large groups (society) but also to smaller groups (sports club, family, and friends). An example of a specific group norm would be: "having breakfast with the whole family on Sundays is a contribution to family life". This results in an unwritten standard for behavior within the family group. Members of this family are expected to be present at this breakfast. Members who are not available for breakfast could be punished socially in the form of jokes or negative reactions. The norm in this example is specific for the given family, but this norm could also be a norm for a larger group or community.

Another important characteristic of norms is that they are by definition *social* and need to be communicated. Norms can only exist when they are shared with others (Cialdini & Trost, 1998).

Transmission of norms can be done in many forms. Examples of (cultural) mechanisms that convey norms are traditions, standards, rules, values and fashion. Norm transmission can be analyzed on basis of intentionality (Cialdini & Trost, 1998). Norm transmission can be direct and deliberate. Examples of direct norm communication are instruction, demonstrations, storytelling and rituals (Allison, 1992). Norm communication can be done more passively too. An example of this subtle and more passive norm transmission is researched by Maccoby (1983). He found that chances that a father would give a doll to a one-year-old daughter than to his son is substantially higher. In this way role patterns of boys and girls are passively communicated to and passed on to children.

According to Cialdini & Trost (1998) there are three goals for individuals to conform to social norms: (1) desire to act effectively, (2) build and maintain relationships with others and (3) to maintain self-image. Maintaining self-image has to do with *personal norms*. They are less relevant within an IT context and are not discussed further. The first two goals lead to specific dimensions of social norms which I touched upon earlier. Deutsch & Gerrard (1955) observed that social influences operate through *informational influence* and *normative influence* which correlate with the two goals acting effectively and maintaining relationships. Cialdini, Reno & Kallgren (1991) proposed the distinction between *descriptive norms* and *injunctive norms* based on these two types of normative influence. The subjective norm introduced in the TRA by Fishbein & Ajzen (1975) is related to *normative influence* and quite similar to *injunctive norms.* In the following three sections each of the norms (descriptive norms, and injunctive norms/subjective norms) are discussed in more depth.

5.2 Descriptive norms

As humans, we are motivated to act in ways that are effective in achieving our goals. The behavior of others can often be a valuable source when optimizing own behavior. Behaviors of others provide a descriptive norm: “Descriptive norms are derived from what other people *do* in any given situation” (Cialdini, 1991). If certain behavior is commonly done in a given situation this provides a descriptive norm. Also, descriptive norms contain consensus information. Descriptive norms refer to what *most others* do in a given situation. In other words: the more people perform a certain behavior, the more accurate and effective we perceive the behavior to be. We see descriptive norms in many forms. If seven out of ten people pick a certain car, this must be a good one and other people pick if for this reason. The “best” song is the one that is sold the most. People look at these music charts to influence their buying behavior. Other trends such as iPhones, Twitter, Blackberry’s also get greater appeal through the mechanism of descriptive norms. As Cialdini, Reno & Kallgren (1991) put it: “If all others are doing it, it must be the sensible thing to do”.

Especially when a certain situations are novel or ambiguous, people use “social reality” (Festinger, 1954) to determine appropriate behavior. Social reality, constructed from descriptive norms, provides a decision heuristic. These heuristics become even more relevant in novel or ambiguous situations (Deutsch & Gerard, 1955). There is a famous experiment by Milgram, Bickman and Berkowitz (1969) illustrating the power of descriptive norms. A few confederates gazed up into the air (at nothing) at a city street. 84 per cent of the pedestrians passing these people joined the confederates for a considerable amount of time also gazing up into the air.

An important aspect of descriptive norms is that these norms rely on the *perception* of what others commonly do. If people perceive that most others engage in certain behavior, they are more likely to do the same. But, there can be a discrepancy between the actual behavior of a group and the perception of this. Cialdini et al. (1991) did several experiments with descriptive norms in the context of littering. When walking in a clean environment, people assume that other people didn't litter, and this affects their behavior. But, even in a clean environment, it could be possible that people litter a lot and that extensive cleaning keeps the environment neat. This perception problem became especially apparent with drinking of college students (Agostinelli et al., 1995). Students engage in excessive drinking behavior because they overestimate the amount of drinking of their peers. Some studies have shown that correcting these misperceptions lead to reduced drinking behavior of students.

As we will see in coming chapters, the altering of norm *perceptions* is one of the keys to influencing behavior. The examples given in this section were all examples where norms *describe* behavior of others. I now turn to normative social influence that *prescribes* certain behavior.

5.3 Injunctive norms

Injunctive norms refer to the approval and disapproval of most others. Cialdini et al. (1991) described injunctive norms: "[Injunctive norms] characterize the perception of what most people approve or disapprove". When people act out of approval or disapproval motives, we refer to this as *normative influence*. Injunctive norms are usually the norms referred to in daily speech. Injunctive norms determine what socially accepted behavior is. For example, People feel obliged to donate to charities at the door because societal norms prescribe that this is the good thing to do. Similarly, the norm of reciprocity dictates that when we receive a favor, the provider can expect a favor in return later on.

An important element of injunctive norm is that they refer to the extent that people feel pressurized to engage in certain behavior (Rimal & Real, 2005). The pressure is based upon the threat of social sanctions. For example, people can lose friendships or expect to lose future benefits within a group. Again, similar to descriptive norms, injunctive norms refer to a perception; it doesn't have to be the case that the expected social sanctions will actually apply. Also because perceptions between individuals differ, norms can produce different results for either person within a group (Lapinski & Rimal, 2005). Further, the sanctions do not have to come immediately from direct peers but can also come later on from the group as a whole. Sanctions do not have to come in the form of the focal behavior but can be on larger issues as group membership (Lapinski & Rimal, 2005). People, who do not comply with the norm, do after all threaten the identity of a group (Sherif et al., 1973). The more salient a specific injunctive norm, the more pressurized people feel in conforming to it. Especially in smaller groups, norms become more salient and therefore injunctive norms become stronger.

It is important to consider that injunctive norms and descriptive norms are two distinct types of influences that can operate at the same time (Conner & Sparks, 1996). For example, one can perceive behavior as uncommon but still feel pressurized to engage in this behavior. The distinction is important, because there are different underlying mechanics. And, these mechanics are activated in different ways. We will see later on that the when both norms are congruent they produce stronger results (Borsari & Carey, 2001). Closely related to injunctive norms are subjective norms. Subjective norms are also based

on normative influence but there are some subtle differences with injunctive norms. I discuss subjective norms in the next section.

5.4 Subjective norm

Subjective norm captures the degree to which a person feels or beliefs that *important other persons* think he or she should engage in certain behavior. The construct is originally introduced in the Theory of Reasoned Action (TRA) and used and replicated in several TAM studies (Venkatesh & Davis, 2000) . It is defined as: "The degree to which an individual perceives that most people who are important to him think he should or not should use the system" (Venkatesh & Davis, 2000). In the technology domain, both peer and superior influences have been shown strong determinants of subjective norm (Mathieson, 1991; Taylor and Todd, 1995). A good example of subjective norm predicting behavior is that of donating organs. When predicting if someone intents to donate his or her organs, it is not enough to only ask what they think about it, but it is also important to consider the perceived expectations and thoughts of friends and family of the focal person. These perceived expectations are an example of a subjective norm.

Subjective norm differs from injunctive norms in the referents of the norm. Injunctive norms focus on *most others*, the group, while subjective norms focus on *valued* or *important others*. In other words: Injunctive norms measure the degree to which one feels pressure from a *group*. Subjective norms measure the degree to comply with specific *individuals*. Furthermore, subjective norms can be measured directly.

With simple and validated questionnaires subjective norms can be measured relatively easy. The subjective norm is normally measured by asking respondents to rate the extent to which "important others" would approve or disapprove of their performing a given behavior (Ajzen, 1991). The constructs used to measure subjective norm are widely tested and reported (Schepers & Wetzels, 2007). Kowalcyk (2008) tested a TAM model within a mandatory healthcare environment for the usage of a digital image system.

An advantage of the subjective norm as construct in this study is that it is already tested and documented in IT settings. As we have seen earlier it is part of the TAM model. In this model the factor "voluntariness" is a very strong moderator of subjective norm (Hartwick & Barki, 1994). Brown (2002) demonstrated in his TAM study that the strength of subjective norm (and perceived behavioral control) increases substantially in mandatory (non-voluntarily) usage environments. In this study these two factors explained over 50% of the variance in behavioral intention. Venkatesh & Davis (2000) concluded that in voluntary environments the subjective norm has more of an indirect influence through perceived usefulness while in mandatory settings it has greater directed predictive power of usage intention.

In this chapter I discussed two types of social norms: on the one hand descriptive, and on the other hand injunctive and subjective norms. The conclusion about the lack of direct influence on behavioral intention in voluntary settings only accounts for the latter type, and not for the one type of norm, while this is also an powerful mechanism that guide and enable human behavior. The question I now turn to this how to design an experiment to test the influence of both type of norms.

6 Social norm interventions

We now know that social norms guide and direct behaviors, although the influence of descriptive norms on IT use in voluntary settings is not tested yet. Therefore in this chapter I focus on the question: How can we deliberately activate the mechanism of social norms, and in particular use descriptive norms to motivate IT usage?

Fortunately, There are quite a few field experiments in non IT settings that explicitly use the descriptive norm to change or influence behavior. In this chapter I provide an overview of these experiments. The goal of this overview is to identify how we can use descriptive norms in combination with other norms in an IT setting, and also take into account possible caveats and problems. Table 1 at the end of this chapter summarizes the overview. The overall trend is that the use of normative messages leads to an increase in desired behavior (typical effect size 20-25%). Furthermore, there are also several concerns that have to be taken into account when presenting normative messages.

The structure of this chapter is as follows. First, I sketch the general pattern of the documented field experiments and what they predict for future similar field experiments. Subsequently, I discuss the possible problems with using descriptive norms. Finally, I synthesize the general pattern and the problems within the context of IT implementations. This synthesis provides the foundation for the design of an IT intervention in Part III.

6.1 General pattern of normative messages in field experiments

There are several experiments that used normative messages to influence desired behavior. During the research introduction we already learned about the towel re-use experiment by Goldstein et al. (2008). But there are many more studies. The studied behaviors are very diverse in these studies: littering, energy consumption, environmental recycling, drinking, tax claims, theft and sun protection. Scholars tested the effect of providing a descriptive norm and measured the changes in the variety of desired behaviors afterwards. The goal of providing the descriptive norm is to activate the norm. Norm activation should lead to an increase in the desired behavior. Usually, the descriptive norm is not manipulated itself (no cheating is done with increasing the actual numbers). The process of presenting the descriptive norm to individuals is referred to as normative feedback. The descriptive norm can be taken from baseline measurements. The information from the baseline measurements is presented to the participants. The message describing the subjective norm could look as follows: “50% of the people in this street recycle 0.8 containers per week”. Often this message is printed in writing, but this can also be communicated by handwritten messages, e-mail or telephone. Subsequently, the effect of the message is measured in terms of changed behavior (dependent variable). The typical effect size is about 20-25% increase of the desired behavior. At the end of the chapter, I included an overview of the studies that followed this pattern in Table 2.

6.2 Learning from concerns in other experiments

Besides the general pattern described above there are some differences and concerns mentioned in the studies. Some studies did include injunctive (or subjective norms) to strengthen the effect of the descriptive norm. Also there were some additional findings that are important to consider when designing the field experiment in the context of an IT system. These important remarks can be

categorized in three topics: boomerang effects, combining injunctive and descriptive norms and medium/exposure. I will discuss the three themes and their respective studies below.

6.2.1 Boomerang effects

One of the most important effects to consider when communicating the descriptive norm are so-called "boomerang effects" (Cialdini, 2003). Boomerang effects occur when communicating the descriptive norm is counterproductive. How can the provision of descriptive norms be counterproductive? The answer is that this is inherent to the way descriptive norms operate. Descriptive norms are standards for accurate behavior from which people do not want to deviate too much. In other words the behavior of people converges to the average norm. This principle of converging to the norm has some implications for providing a descriptive norm. People who perform better than the norm could decrease a bit on average. People who perform a lot worse than the norm will increase in desired behavior on average. This means that the *net result* of descriptive norm provision can be worse than the baseline (on average more people drop in desired behavior than people increase). When the net result of norm activation is below the baseline, this is a boomerang effect.

Boomerang effects are stronger when undesired behavior is communicated. as the one which occurs more frequent than the desired one. In such case one communicates implicitly that the current norm is to perform the undesired behavior. Cialdini et al. (2006) gives an example from a forest park. In the forest park one could read the following sign:

> "*Your heritage is being vandalised every day by theft losses of petrified wood of 14 tons a year, mostly a small piece at a time*."

This sign conveyed that on a regular basis petrified wood is stolen and this message even worsened the problem (!). In the above message it is relatively easy to spot the undesired behavior as a norm. The problem with the message above is that it communicates that apparently many visitors take wood pieces from the forest. Rather than invoking the desired behavior (leaving wood pieces in the forest) it communicates that if you steel wood pieces you are not the only one. Cialdini et al. (2006) concluded that the above message is not effective as it communicates an undesired descriptive norm. Further, also a second observation can be made from this experiment. The "14 tons a year" in the message look like a huge amount, but Cialdini et al. (2006) found out that this means that less than 5% of the people actually took a piece of wood from the forest (which would be a more effective descriptive norm to communicate). In the experiment the "14 tons a year" seemed to be counterproductive, however I hypothesize that this mechanism can also be used in a productive way. This can be done in cases where the desired behavior is performed by a minority. The observation can be defined as: When the majority of a certain group is *not* performing the desired behavior, one can better communicate an alternative measure such as a high absolute number. With the alternative measure the desired behavior gets communicated as frequent rather even if it is performed by the minority.

From the -obvious to spot- undesired norm we continue to a more implicit variant. The following message also risks the boomerang effect:

> *"25% of your colleagues use the IT system on a regular basis. Please join them and also start using the system".*

This message implicitly communicates that 75% of the people are *not* using the system and that people actually conform or comply with the current norm when *not using* the system regularly. The effect is also explicitly tested in studies with provision of a low descriptive norm (Cialdini, 2003) (Schultz et al., 2007).

Another study describing and testing this mechanism is Gerber (2009). Gerber (2009) tested the boomerang effect for voting intentions. In this experiment he tested the effectiveness of two scripts: a low descriptive norm (not many people will vote) and a high descriptive norm (many people will vote) in relation to voting intentions. Potential voters received a phone call where one of the scripts was provided to them. Afterwards they were asked the chances that they would vote themselves. From a rational perspective it would make sense to vote when most people are not voting as these increases the significance of one's own vote. However, after hearing the high descriptive norm people were substantially more motivated to vote and vice versa. This study is thus consistent with the reported boomerang effects in the earlier studies by Cialdini (2003) and Schultz et al. (2007).

Boomerang effects are an important factor to consider in the context of IT systems. After all, the adoption rate of IT systems is often quite low. Using these low adoption rates as normative feedback could easily invoke boomerang effects. The communication of the low descriptive norm will not result in an increased system usage since most participants already comply with the norm, which is that they are *not* using the system. Therefore, the earlier observation that another way of describing the norm can be more effective is thus also relevant: One could minimize the boomerang effect with using alternative measures. This could be absolute numbers or only providing the average of high-using subgroups. In this way the desired behavior is described as frequent even when it is performed by the minority.

6.2.2 Combining descriptive and injunctive norms

Another way to deal with the boomerang effect is to align descriptive and injunctive norms. With alignment is meant that both the descriptive and the injunctive norm describe and prescribe the same behavior. The injunctive norms could then be used to indicate that the behavior of the minority is the *approved* or *socially accepted* behavior and thus is the norm to converge to.

Schultz et al. (2007) demonstrated that the boomerang effect could be prevented with this alignment. Schultz et al. (2007) conducted a field experiment to decrease energy consumption at homes in a town in California. On average 40 per cent of the homes performed well at the initial baseline measurement. During a period of several week each of the homes received feedback about how many energy they were saving in comparison to the norm. One half of the homes also received an injunctive component in their messages. Injunctive norms were added with large emoticons (e.g.: approval was a large happy emoticon: ☺) for people above the average and with a unhappy emoticon (☹) who were below the average. In this way the boomerang effect could be minimized: "However, adding an injunctive component to the message proved reconstructive by buffering this unwelcome boomerang effect." (Schultz et al., 2007). The injunctive component told people performing below the norm or average that

they should improve while people who are performing better than average are told that they are doing the right thing and should continue with this. People in a control group in this study which were only provided the descriptive norm did consume substantially more.

A recent study on the use of sun block further elaborates on the strength of inclusion of both norms (Mahler et al., 2008). In the study was tested how effective the addition of descriptive and/or subjective norm information was in comparison to regular knowledge-based (information with pro/cons) interventions or no intervention at all. This is one of the few studies were the descriptive norm is actually manipulated. The experimenters choose to inflate the descriptive norm to 85% ("A recent survey showed that 85% of Southern California college students are now using sunscreen regularly"). The descriptive norm was delivered orally by the experiment before the interview and re-iterated in an audio tape with role playing demonstrating pro-using behaviors. The injunctive information was added with usage information from a professional organization suggesting that one *should* use sun care. The effect size of the normative intervention in comparison to the regular information-based intervention was an increase of 43%. Further the authors mention the following: "Also, the additional combination of *both* types of normative information increased self-reported sun protection behaviors during the subsequent month" (Mahler et al., 2008)

6.2.3 Medium and exposure

Studies on descriptive norm rarely discuss the nature of the medium and exposure, while it can be inferred that these variables might have an effect. The importance of the nature of the exposure can be inferred from an interesting finding by Schultz (1999) which is not discussed in later studies. This finding is that descriptive norm (group feedback) produced a longer lasting change than invoked individual norms (one's own standards used as reference for deciding about behavior). A longer lasting change means that the effect of the descriptive norm intervention also keeps apparent in the post-intervention period. But, the initial effect of the descriptive norm was smaller than in the case of individual norms. It needed some time to reach its effect. The explanation by Schultz (1999) was that individual norms already exist (they are created during someone's lifetime), while the norm of the group may require more time to be activated. Persons need to internalize and process the new norms and this takes some time. The longer lasting effect of descriptive norms in relation to behavior is also noted in a meta-analysis of TPB studies and their relationship to injunctive and descriptive norms by Manning (2009).

I think that (without the authors explicitly addressing this) the frequency and salience of the descriptive norm provision in the field experiment supports the activation process described above. Several studies (Schultz et al., 1999; Schultz et al. ,2007; Goldstein et al, 2008)) kept informing the participants repeatedly about the behavior of the group (i.e. weekly/monthly updates about the recycling behavior of the whole street). This repeatedly exposure helps enforcing and activating the group norm. As Schultz (1999) argued it takes some time to activate the group norm, therefore repeated exposure can help this activation process. Another interesting thing about frequently communicating the norm is that it activates the mechanism of positive feedback (a descriptive norm by itself). As people see the weekly averages increase, this trend by itself can even further enhance the normative effect.

In line with the Focus Theory of Normative Conduct (Cialdini et al., 1991), also salience of the message (plays a role: Door hangers and signs in parks are salient ways of communicating the norm. In example: the door hanger in the hotel room stays present in the room. When one is evaluating to perform the recycling behavior one can read the door hanger. When walking through a forest park one can place multiple signs that keep people reminded of the norm. With the above discussion in mind, it can be expected that the full effect of descriptive norms can be better realized by exposing participants in an experiment to the norm in a frequent and salient way.

Now I can come back to the topic of what medium to use. It didn't seem to matter what medium was used to transmit the message: an oral or written communication method. But, it does seem to matter *when* the norm is communicated. Norm activation is most effective when the behavior is focal (Cialdini et al., 1991). Therefore, these findings suggest that medium should be chosen that is most appropriate in the setting of the focal behavior. The medium must support the fact that the normative message gets communicated on the moment that the behavior is taking place.

6.3 Conclusions for social norms in the context of IT systems

Summary of key findings that have to be taken into account:

- Descriptive norm should be presented through normative feedback (e.g.: "60% of your group is performing this behavior. Please join them")
- Expected effect size is an increase of about 20-25% of the desired behavior.
- Describing undesired behavior as frequent will lead to boomerang effects
- Boomerang effects can be minimized by:
    - Aligning descriptive and injunctive (or subjective) norms
    - Describing the desired behavior as frequent (for example: "14 tons a year")
- The messages can be conveyed through several mediums (orally & writing) but in any case should be communicated on the moment the behavior is taking place.
- Descriptive norms take some time to activate. Therefore: repeated or intense exposure and use of salient messages can increase the effect size and lead to more long lasting change.

Source	Behavior	Type of experiment(s)	Results
Cialdini et al. (1991)	Reducing littering	Field experiment with pro and contra littering messages using the descriptive norm.	Descriptive message lowered littering substantially. Littered environments induce littering, while clean environments induce to not litter.
Schultz (1999)	Curbside recycling	Field experiment activating personal (individual) and social norms (descriptive norm) through feedback; Medium: Door hangers	An increase of about 20% recycling behavior in both individual and descriptive norm feedback groups. Group feedback was more sustainable than individual feedback. Feedback was repeated for four weeks.
Agostinelli G et al. (1995) Nye et al. (1999) Werch et al. (2000) Lewis & Neighbors (2006) Neighbors et al. (2006)	Drinking among college students	Several field experiments that used normative feedback to correct misperceptions and reduce drinking. Neighbors (2004) even used computerized feedback.	Mixed results. This has to with several factors: - Misperceptions about the actual norm - Boomerang effect (Implicitly telling others that drinking is regular raises the problem.)
Wenzel (2005)	Tax claims	Field experiment with looked upon the relationship between tax claims and deductions and perceived (descriptive norms)	The tax ethics of other tax payers did influence the claims made by 1500 Australian taxpayers. Work related claims were similar to control group, but other deduction claims were significantly reduced.
Cialdini et al. (2006)	Theft of petrified wood pieces from forest	2x2 factored design (descriptive and injunctive norm) x (negatively and positively worded).	Positive (or high) descriptive norm seem to be more powerful. Injunctive norms are stronger in negative form. About 25% less theft of wood pieces in case of most powerful design.
Schultz et al. (2007)	Energy consumption at home	Field experiment with repeated door hangers with personalized feedback on energy consumption.	Significant lower kilowatt/h usage. Further aligning subjective and injunctive norms further increases the effect size.
Goldstein et al. (2008)	Towel re-use in Hotel chain	Field experiment using descriptive norms to motivate towel re-use. Medium: Written	An increase of about 33% in the desired behavior. Written door hangers describing that 75% of the people in that

		communication	room re-used their towel seemed to be most effective.
Mahler et al. (2008)	Using sun protection	Field experiment presenting information about sunshine with or without social norms information. Medium: Orally	The social norms (descriptive and injunctive) addition on the informative message increased intention of usage behavior (effect size 43%). Furthermore in combination the effect size was the most powerful.
Gerber & Rogers (2009)	Voting in political elections	Two field experiments with comparing low and high descriptive norm scripts to measure voting intention. Medium: Telephone	High descriptive norm scripts were significant more powerful for influencing voting intention. And effect size was biggest for infrequent and occasional voters

Table 2: Overview of field experiments that study descriptive norms that influence behavior.

Part III:
Design of an organizational intervention

7 Design of norm intervention for IT use

In the previous chapters, we have seen how social norms motivate human behavior. We also looked at particular examples of successful interventions such as the towels in hotel rooms or energy consumption. The follow up question treated in this Part III is how to design such an intervention for IT usage? Specifically, the research question (RQ3) I answer is:

> *"How can social norms be used in an organizational intervention to increase individual acceptance of an IT system?"*

7.1 Translating literature findings into a design

To come up with a successful design, I first briefly summarize what we have got so far: I discussed two parts of social norms literature: (1) literature on social norms in general and (2) literature on normative feedback interventions. The first literature part showed the distinction between *informational* and *normative* influence. I also discussed that TAM only explicitly addresses normative influence with the subjective norm. There are several conclusions on the relationship between both type of norms and IT:

- Current IT acceptance and adoptions models only include subjective norms to predict IT use, while descriptive norms are not taken into account;
- The use of descriptive norms can be tricky when it low regarding the desired behavior. This is often case for IT applications since they tend to have low adoption rates; (current norm/baseline);

The second part of the literate study focused solely on discussing literature that discusses actual interventions with social norms. The literature review highlighted some key findings that should be considered when designing an IT intervention. These key findings are:

- Norms can be activated through providing people with *normative feedback*
  - Normative feedback is most effective for people who are performing below the norm
  - Normative feedback should be repeated for maximum effect size as descriptive norms take some time to activate
  - Normative feedback should be presented when the norm is *focal*
- Norms are more effective when the people who the norm applies to are perceived as *similar*.
- Describing undesired behavior as frequent can lead to boomerang effects. Boomerang effects can be minimized by:
  - Aligning descriptive and subjective norms
  - Describing the desired behavior as frequent (For example: "14 tons a year")

The various interventions on energy consumption, littering, voting and drinking behavior, social norms have demonstrated the strength of *normative feedback*. When people are made aware of a norm, this can motivate them to show the desired behavior (Petty & Cacioppo, 1986). These conclusions help us to craft an effective message for my field experiment. In the next sections I develop a similar normative feedback intervention for IT usage.

7.2 Personalized normative feedback intervention for IT use

The first question to answer is how a *personalized normative feedback intervention* for IT usage should look like. The goal of such an intervention is to motivate a target group to use an IT system. In the case of an IT usage intervention, the target group is often a company or a department within a company. The intervention will expose the target group to normative feedback and measure whether it had any effect on the use of the IT system. *Normative feedback* means that individuals of the target group are informed how they are performing in comparison to the norm. Information included in normative feedback in an IT setting could refer to are:

- How many hours a given user is spending in comparison to the other users
- How complete a certain user profile in a IT system is in comparison to the other users
- How many sales are submitted in a certain system in comparison to the other users

Normative feedback interventions, I discussed earlier showed a specific pattern. Figure 5 summarizes this pattern. The five important activities seem to be (1) defining IT use, (2) determining the baseline, (3) develop measure for the norm, (5) personalize messages and (5) communicate the norm. For each of these activities some key aspects and variables have to be considered. Below, I discuss each of the activities and key aspects for consideration.

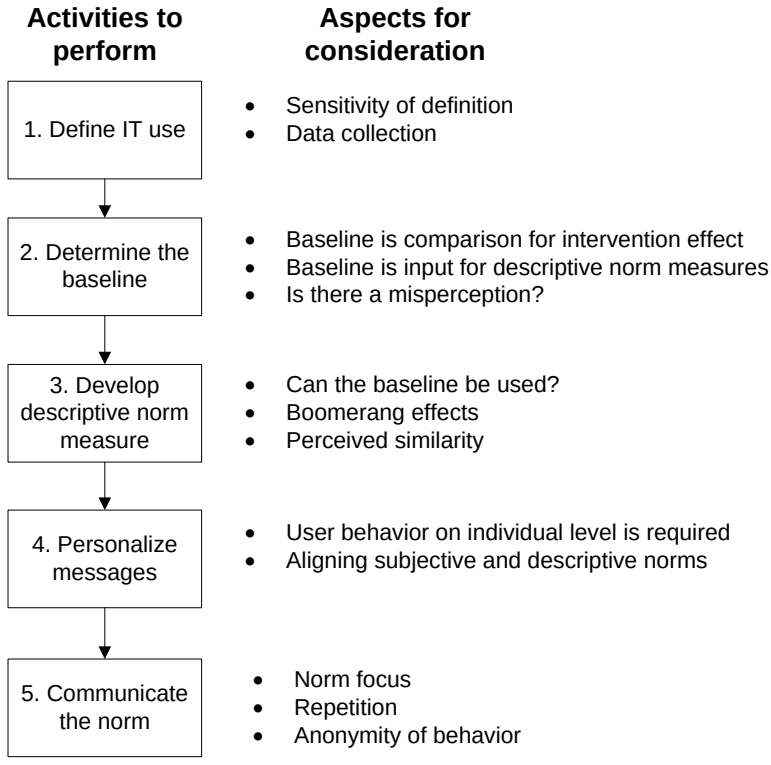

Figure 5: Designing a personalized normative feedback intervention for IT usage

1. Define IT use. What does IT use mean? It is important to define IT use as clearly as possible. Does IT use mean clicking occasionally through an IT system? Or is spending more than 2 hours on a daily basis using the IT system? This first step seems trivial, but it is not. All of the discussed norm interventions first define the behavior. For example: Towel re-use was defined as using the same towel for two or more nights by the same guest(s). If re-use was defined as re-using towels for three or more nights, what would be the effect? We can assume that other results certainly might be possible. Maybe less people re-use a towel for three nights, and in this case also the provided norm of 75% would be incorrect. Furthermore, the definition of the behavior, in this case IT use, determines the data collection procedures. The experiment of Gerber & Rogers (2009) defined voting behavior as one's intention to vote. This allowed them to call participants to ask their voting intention after providing them with a norm script. Other definitions of voting behavior, could have led to different procedures and outcomes. E.g.: providing people with a norm before they actually go to vote. And subsequently, measuring their voting behavior by asking respondents what they actually voted after the fact.

To conclude, two factors seem to be important. First, the sensitivity of the IT usage definition should be explored. The definition determines the data collection but also influences the results. The researcher needs to be aware that different procedures can produce different results. Second, as a prelude to the coming activities, choosing a definition that allows a higher baseline is generally a good idea. During activity three, when I developed measures for descriptive norms based on the baseline, it is to be recommended to explore whether different behavior definition alternatives exist. If so it may be wise to choose the one that allows for the highest baseline.

2. Determine the baseline. How do we provide this normative feedback in an effective way? After the definition of IT use, a baseline can be established for the usage in the target group. This is necessary for two reasons. The first reason is that you need this baseline to assess the effect of the intervention afterwards. It provides a basis for comparison later on. The second reason is that the current baseline determines what kind of measures can be used in the normative message. If the current majority (above 50%) uses the system one could use this as a beneficial descriptive norm. When the majority is *not* using the system, which is a common practice during IT adoption stages, one should consider alternative measures in the next step. Furthermore, in this first stadium it can be beneficial to identify whether there is a "misperception" problem. This occurs when the perceived norms to not match reality. In this case correcting the misperception can be enough to ensure victory. Questions to detect such a misperception are: Is the IT usage behavior relatively anonymous? Is the perception of people similar accurate in respect to the actual usage behavior?

3. Develop descriptive norm measures. The third step is to develop the *measures* to present a descriptive norm to the target group. A "right" descriptive norm describes the desired behavior as *frequent* (even if the majority is not performing it). In some cases such a norm is easy to define. For example, if 95% of the people is *not* stealing wood pieces from the forest. This would be a good measure to use as descriptive norm. How should the descriptive norm be presented when the majority is not performing the behavior? As I noted earlier: one should use alternative measures to prevent boomerang effects. The alternative descriptive norm could be taken from a specific subgroup (e.g. 55% of the users in the department "Sourcing" use the system on a daily basis). Or alternative measures could be used

such as: “on a monthly basis more than 500 people use the system”. In this way the behavior is perceived as frequent and possible boomerang effects can be minimized. Furthermore, people identify with others who are perceived as *similar.* Therefore, it is important that the presented descriptive norms apply to the target group. The question to be addressed in the design of the intervention is whether the provided descriptive norm is used by people similar to the target group?

4. Personalize messages. Subsequently, one should tailor the specific messages to each individual. The reasons for this are twofold. The first reason is that this is necessary so people can compare their own IT usage behavior in comparison with the group. This creates actually *feedback.* Personalized information has more effect than a general message. In this way the subjective or injunctive norms can be aligned with both the descriptive norm as the specific behavior of the individual. The second reason is that one needs to distinguish between people who are performing above (high-baseline) and below (low-baseline) the developed norm. If people are performing above the norm they should be “rewarded” with signs of approval and when people are performing below the norm they should be notified with the proper disapproval.

Personalization and alignment of norms is similar to the energy consumption intervention I described earlier. Each home was told how many energy they used and how much energy the average household was consuming. Also disapproval of the specified energy consumption was given in the form of emoticons. In order to actually be able to perform this step one needs usage information of IT systems on individual level.

5. Communicate the norm. The last step is to actually communicate the message to the target group. Which factors should one consider when communicating the message? According to the literature the medium is not the most important factor to consider when communicating the norm. Door hangers, signs, phone calls or voicemail messages all seemed to get the message across. Important factors to consider when communicating are norm focus and repetition. The Focus Theory of Normative Conduct (Cialdini et al., 1991; Callgren, 2000) describes that normative interventions are most effective when the behavior is focal. Hence informing people about drinking norms is most effective when it is done in a bar. Therefore, in the case of IT, I suggest to present the norm when people are behind or close to their computer. The norm can be presented on the computer itself (desktop background, screensavers, e-mails) or in the environment of the computer (sign/posters on desk, wall or office). Further, the norm should be salient enough. Presenting the norm only once is not very likely to have long lasting effects. A combination of channels could also help to ensure people take note of the prescribed norms. Furthermore, it takes some time to activate the normative mechanisms. Continuous or repeated exposure of the norm message is most likely to have the biggest effect.

I want to devote some special attention to the aspect anonymity in the process of communicating the norm. Norms and especially normative influence operate in public settings. IT behavior can vary on the continuum of private/public behavior. Some IT systems work with username and make the activities of users visible (for example: a wiki system, e-mail). However, many systems do not make activities of users visible. In these cases the IT usage behavior stays anonymous. This anonymity can be partly removed by the personalized feedback intervention. When you tell people “You use the system once a week, the

norm is to use it every day", people notice that their behavior is no longer *totally* anonymous and at least monitored on aggregate level. This effect can further be enhanced by presenting the usage behaviors to the whole group. In this way the results and usage behavior get public and people are more likely to comply with group norms.

To summarize, I presented a generic design to develop a normative feedback intervention for IT use. In the coming chapters we will see how this generic design is used in a concrete IT usage case. I design a personalized normative feedback intervention. The intervention is empirically tested in a field experiment afterwards.

8 Application of design: My Site

To successfully test my normative feedback design, I need a concrete setting to conduct a field experiment. I choose IT use in a Big Four company in Netherlands. This IT system is called My Site. My Site is a relatively new IT system and has some adoption problems. In this chapter, the normative feedback intervention will be tailored for the My Site case based on the generic design from the previous chapter.

This chapter is structured as follows. First, I introduce My Site. Second, before I present the design, we need to know which people will be part of the intervention. Therefore, I introduce the target group in 5.2.I will identify two subgroups within the target group. For each of the cases the design activities (Step 1 – 5) are discussed. Finally, I present the result of this chapter which is the proposed intervention within the Big Four company.

8.1 My Site: voluntary IT system

This section introduces the My Site system and discusses how it will be part of the intervention. My Site is a skills and expertise system used within the international network of a Big Four company. The goal of this system is to support the process of finding people. The process of finding people is especially important for the consultants within the project acquisition and initiation phases. Usually when preparing an offer the senior people have to form a team that can fulfill the project. Finding people with the right qualifications is often a time-consuming job which involves many phone calls.

My Site should ease the process of finding qualified people. In order to make My Site an effective system, people are expected to build a profile in the system. Each person has already a standard profile on the portal. These standard profiles are created automatically when a person joins the company and for the existing employees with the launch of the system. This standard profile contains only personal information. So people are required to extend the standardized profile with their unique information. Furthermore, they are also expected to update the profile regularly. After each project people have gained new experiences that qualify them for more future jobs. The system provides an internal social network that can be used as a reference within the whole company.

The use of My Site is voluntary. People do get informational messages that tell them how to use the system and why it can be useful. However, the system is by no means part of procedures or necessary to perform the activities of the job. Furthermore, My Site is not tied to employee evaluation or any other financial incentives. People within the company argue that the non-voluntariness of the system leads to non-adoption or low usage.

8.2 Target group of intervention

The target group is a subgroup of My Site users. This means that these specific people will get normative feedback to boost their use of My Site on a more regular basis. The target group is the IT Advisory business unit. There are two service groups in this business unit: Performance & Technology (P&T) and Risk & Compliance (R&C).

Table 3 summarizes some descriptive statistics about the P&T service group. This service group focuses on delivering consultancy services to clients. P&T consists of 120 people. These 120 people are all persons who are expected to use the system. I filtered out secretaries and people who recently left the company but were still listed in the company directory as these people are not relevant anymore. I also excluded myself from the sample. Furthermore, there are a total of six service lines within the P&T group: Business Intelligence, ERP, Infrastructure & Architecture, Project Advisory, Sourcing and (IT) Strategy.

Table 4 summarizes the descriptive statistics about R&C service group. This service group focuses on auditing services for clients. R&C is a little bit bigger than P&T and contains 145 consultants. There are also 6 service lines for R&C, but organized regionally: Amsterdam GP, Amsterdam ITS, Amsterdam ITS, de Meern, Eindhoven and WZW.

There are seven hierarchical function levels possible as seen in Table 5 and 6. The levels are ordered from lowest (Stageair) to highest (Partner). Each person has a function level and a service line.

Service Line (SL)	Active consultants
P&T Business Intelligence	21
P&T ERP	25
P&T Project Advisory	15
P&T Sourcing	11
P&T Strategy	36
P&T ITPA	15
Subtotal	120

Table 3: Descriptive statistics of ITA P&T

Service Line (SL)	Active consultants
R&C Amsterdam FS	17
R&C Amsterdam GP	24
R&C Amsterdam ITS	23
R&C de Meern	25
R&C Eindhoven	30
R&C WZW	28
Total	145

Table 4: Descriptive statistics of ITA R&C

Function level	Number of persons
Stageair	3
Junior Advisor	17
Advisor	29
Manager	33
Senior Manager	22
Director	3
Partner	13
Total	120

Table 5: Function levels P&T

Function level	Number of persons
Stageair	6
Junior Advisor	46
Advisor	40
Manager	17
Senior Manager	24
Director	2
Partner	10
Total	145

Table 6: Function levels R&C

8.3 Applying intervention design for My Site

In this section I explore how a normative feedback intervention is designed for My Site. The goal of this normative feedback intervention is to ultimately enhance My Site usage. I use the generic design developed in Chapter 7. Each of the five activities is discussed in-depth for My Site.

8.3.1 Step 1: Define IT use – What is using My Site?

This section details the current usage of My Site. The current usage is an important factor for the field experiment, because it is necessary to effectively test the effect of the organizational intervention. In order to measure the effect of the intervention I need to know what to measure. To determine the baseline for current usage, the first question to answer is: "What means *using* My Site?" The system can be used in the following ways:

- **Extend your own standard profile**: This means that people update their standard personal profile with relevant information that can be used to find them;
- **Update the extended profile with new job experience :** This means that the extended profile is updated after a certain time span with the new qualifications and experience of someone;
- **Search for other people:** Search for people in certain fields of expertise based on keywords.

The problem is that currently a lack of profiles globally makes the third option (searching for other people) not meaningful. The first two usage behaviors seem most relevant: extending the standard profile and (regularly) updating this. However, company statistics show that less than 30% has even extended their standard profile, and thus can perform the second form of usage: update their extended profile. Therefore, the primary usage behavior to focus on for now is: the extension of the standard profiles.

Still, the extension of standard profiles needs a more detailed description. Which additions of the standard profile qualify as the extension of a standard profile? Does only filling in one's favorite food qualifies as extending the standard profile? The obvious answer is of course not. Let's go back to the system itself: The system functionality mirrors the profiles of popular social network sites. This means people can add many details such as photos, resume's, fields of expertise, birthdays and favorite food. I define which of the properties of a profile are required to make it useful.

For this definition I go back to the process of finding qualified people. When searching for people to form a project team, usually three things are needed:

- Fields of expertise (these are the keywords to search on)
- Photo (to be included in the project proposal)
- CV (To assess if someone is truly qualified and this document is also included in the project proposal)

With the above requirements in mind, I define extending the standard profile as: *when users add a photo, resume and fields of expertise to their standard My Site profile*. Now also the second usage behavior can be defined (which can be helpful later on). The second usage behavior, updating the extended profile, is defined as: *when a user changes his resume or fields of expertise of his extended profile*.

8.3.2 Step 2: Determine the Baseline

With the definition of the usage behavior: extended standard profiles, I can start to measure the baseline of this behavior for both service groups (P&T and R&C). Figure 6 provides a bar chart with the current usage of each of the six service lines. This data is collected by querying the SharePoint server for profiles within the target group that have a profile including a photo, resume and fields of expertise.

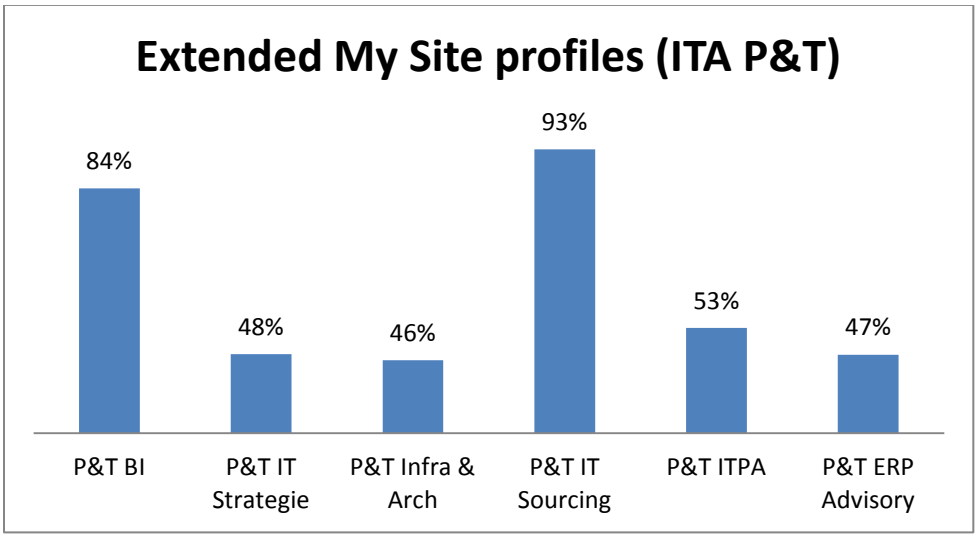

Figure 6: Extended My Site profiles (P&T)

P&T Figure 6 shows that the majority of the P&T consultants did extend their standard profile. To be more precise: 71 out of the 116 consultants (61%) extended their standard profile. Sourcing is the best scoring service line with a percentage of 93%. 13 out of 14 consultants filled their standard profile. ERP Advisory and Strategy seem to score relatively the lowest with 49% and 27%. These are also the largest service lines with 25 and 36 consultants. A possible explanation is that in the larger groups people are a bit more anonymous, and thus it is easier not to extend a profile since it is not detected.

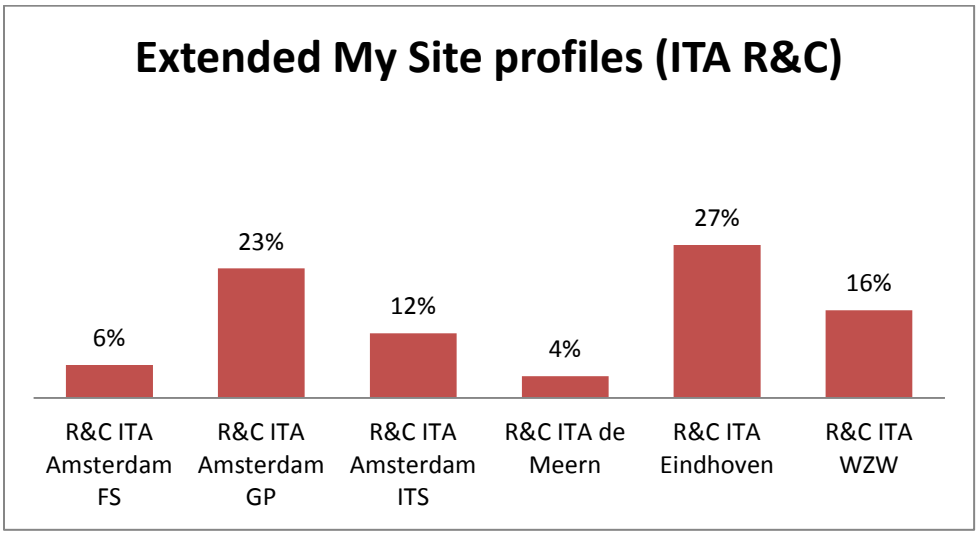

Figure 7: Extended My Site profiles (R&C)

R&C Figure 7 shows that the vast majority of R&C consultants did *not* extend their standard profile. The best scoring service line is ITA Eindhoven with only 27% of extended profiles. For the whole R&C group, only 17% extended their profile. This means that the actual norm is not to fill in the profile. This has several implications for the subsequent steps. The current baseline of R&C cannot be used as descriptive norm itself. Using the R&C baseline would risk incurring boomerang effects.

Figure 8 summarizes the information for the target group. On average 36% of the people did extend their standard profile. The P&T and R&C group have notable subgroup differences. P&T has a clearly favorable actual norm towards extending My Site profiles with 61%. This is the opposite for R&C with only 17%. These subgroups are therefore structurally different. This has several implications for the design of the intervention. Furthermore, I will keep reflecting upon these subgroup differences in the remainder of this document.

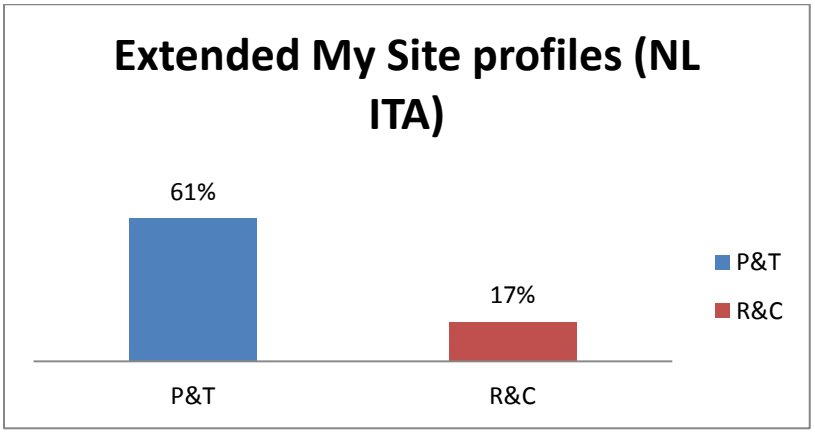

Figure 8: Extended My Site profiles (P&T and R&C)

8.3.3 Step 3: Determine the right measures

The third step in the intervention design model is to determine the right measures for the descriptive norm. The baseline statistics already give some hints for the intervention: using current averages as descriptive norm is expected to convey the desired norm in P&T. The majority of the P&T group (61%) has extended their standard profile in the system. In addition, the service line “Sourcing” within P&T has 93% of the standard profiles extended. Also this percentage could be used very well as a descriptive norm. As R&C only has an actual percentage of 17%, I propose to “borrow” the P&T descriptive norm. P&T and R&C are not the exact same group, but both are part of IT advisory after all.

However, I want to develop an additional descriptive norm measure for R&C to ensure that within R&C the behavior also is perceived as frequent. One of the key aspects of developing an effective descriptive norm is *perceived similarity*. You could put it in the following way: The more people feel that the norm applies to the group they are part of, the stronger the effect of the norm on an individual’s behavior. Especially in the case of R&C, I expect that providing the norm of only the P&T percentage might not provoke the desired effect. The groups do not have a full similar group identity. This is because people

at R&C are more IT auditors, while the people at P&T are more IT consultants. As noted, also the actual amount of extended profiles varies substantially between them.

I want, therefore, to develop an additional descriptive norm that describes My Site use in R&C as frequent. This additional descriptive norm will also be used for the P&T group to keep the intervention comparable. I propose to use an alternative measure of three similar colleagues for low-baseline users:

> "You could consult Colleague A, Colleague B or Colleague C on how they filled in their My Site profile"

If three similar people in your immediate surrounding did extend their profile, the behavior should look more frequent. The idea is similar to the "15 tons a year" in the forest (Cialdini et al., 2006) and "of the people in *this room*" in the hotels (Goldstein et al., 2008). In what sense is this similar? Well, mentioning three colleagues demonstrates that the behavior is frequent, and the norm applies to the reader as these colleagues are closely related.

I developed a database query to find those similar colleagues for each low baseline-user. I It seemed reasonable to assume that in this Big Four company the following three variables predict similarity: Service Line (same department or subgroup), Title (hierarchical position) and Office (physical location). As rooms are very small or people are working at flexible office space, service line and title seemed to be the most predicting variables of those 3. For every low-baseline user I could find the most appropriate matches by rating each dyad. The three dyads with the highest scores are the most similar. When more options were possible I selected randomly. In Appendix C, I enclosed the database query. In modified form this query can possible used in other company settings to find similar colleagues. During the results and conclusions, I also reflect upon the effect of perceived similarity.

8.3.4 Step 4: Personalize messages

The fourth step consisted of making the messages personalized. This is necessary because in this way people get confronted with their own behavior in comparison to the norm. In order to be able to create messages on individual level, I need usage statistics for each user. Therefore, I collected information about all the profiles in the target group.

One of the aspects of step 4 is aligning subjective/injunctive and descriptive norms. I can make a distinction between two messages: The people who did not and did extend their profile. For the people who did *not* extend their profile. A message similar to the one below is appropriate:

> *"63% of the people within ITA P&T filled in their My Site profile. The best scoring service line is Sourcing" with a percentage of 93%.* ***Unfortunately****, your profile is still empty. Please fill in you're my Site profile with a resume, photo and areas of expertise (just like your colleagues)."*

One of the key words in the message above is the word "Unfortunately". It indicates the disapproval of the sender, that the profile is empty. Also the percentages with filled My Site profiles indicate that the majority of the people did fill in their profile and should provide a powerful descriptive norm.

For the people that already filled in their profile a simple variant of the message above can be used:

> *"63% of the people within ITA P&T filled in their My Site profile. The best scoring service line is Sourcing" with a percentage of 93%.* ***We are glad to see*** *that you filled in your profile. We encourage you to keep your profile up to date."*

The first two sentences are exactly the same. The difference lies in the last two sentences. These last two sentences are used to align the subjective and descriptive norm again. As someone is performing with (or above) the norm they have to be reminded of that.

8.3.5 Step 5: Communicate the norm

The final step involves communicating the norm. Aspects to consider in stage are: norm focus, salience and anonymity. Let's start with norm focus. The Focus Theory of Normative Conduct (Cialdini, 1991; Callgren, 2000) asserts that the norm should be presented when the behavior is focal. In the case of My Site I want to present the norm when people are close or around their computer. The most obvious choice for computer-related messages is e-mail. Also e-mail based persuasion seems comparable to offline communication, according to two studies by Guadagno (2002, 2004). This is especially true for males, and thus fits the bill since the majority of the consultants at this Big Four company are males. Also, the previous step implies that we have to send individual messages as I have personalized messages for above and below norm performers. Furthermore, sending a mail to all persons at once (with them seeing it), could provide an undesired norm by itself.

The second aspect to consider is norm salience. Descriptive norms can take some time to activate. Therefore, it is beneficial to have some repeated exposure to the norm to enhance the effect of normative feedback. In the case of the e-mail, I propose to send some follow-up e-mails with the new statistics. This will keep people reminded about the norm, but also show (as I expect) that even more people complied with the request, which is a descriptive norm by itself: As other people are filling in their profile in response to this information.

The last aspect to consider is anonymity. Normative information is most effective when the behavior is perceived as public. The question is: to what extent is My Site usage perceived as public? Do people know what others do? Do people know that their own behavior is seen by others? In the case of My Site the behavior seemed quite anonym. When asking a few people: "Do you know which colleagues have a My Site profile?" they did not have any clue. Therefore, I propose to inform people about two facts: (a) that their behavior is being monitored in the research I am performing currently (b) I announce that follow-up e-mails will contain information on a personal level.

8.4 The result: proposed normative feedback intervention for My Site

I introduced My Site and discussed each of the design activities in the sections above. This section details the proposed design. This design can be described as a personalized e-mail campaign with the following specific details:

- Using My Site means extending the standard profile (Step 1)
- The right descriptive norm: The e-mail should describe the desired behavior as frequent with the 63% and the good scoring line sourcing with 93%; (Step 2-3)
- Mentioning three *similar* colleagues to describe extending My Site profiles as frequent behavior. This to ensure that the *perceived similarity* of the norm increases. (Step 3)
- The e-mail should contain both descriptive as subjective norms which are aligned: Low baseline and high baseline users get a different e-mail. (Step 4)
- To ensure norm activation: there should be follow-up e-mails (Step 5)
- To remove anonymity: People are made aware of the fact that their usage is monitored and that a public list will be enclosed follow-up e-mail. (Step 5)

The e-mail below is the first e-mail that was sent uniquely to each low-baseline performer. Low-baseline performers are in case of My Site, users that did not extend their standard profile since the beginning of this year. The design is translated into this specific e-mail:

> *Dear <first name>,*
>
> *Imagine that all relevant information of your colleagues is available through one click? This would be much easier than all the necessary telephone calls to find out which colleagues qualify for the next proposal. This is the reason we have introduced My Site in the beginning of this year and tried to actively promote this.*
>
> *Within IT Advisory NL we are collecting information about My Site usage.* ***The results of this research show that 66% within ITA P&T has an updated profile****.* **The best scoring service line is Sourcing with 93%** ***(A)****. In the beginning of February there will be an update about My Site usage within ITA P&T.* ***In these update the scores for each of the service lines will be announced with an included overview of names (B).***
>
> *My request to you is to update your profile extensively with Photo, CV and fields of expertise.* ***You can ask your colleagues <ColleagueA>, <ColleagueB> or <ColleagueC> how they filled in their profile (C).***
>
> *Below you will find a quick reference to a four step manual:*
> *<LINK>*
>
> *Towards an updated profile!*
>
> *Kind regards,*
> *<NAME OF RESPONSIBLE PARTNER OR SENIOR MANAGER>*

The above e-mail contains several sentences that contain normative information. Below is discussed which sentences contain normative information and which norm they invoke. The e-mail contains normative information in the following ways:

A) ***"The results of this research show that 66% of our reference group within this company has an updated profile".*** The percentage of the reference group conveys a descriptive norm: Within this company it is frequent behavior to fill and use My Site.

B) ***"In these update the scores for each of the service lines will be announced with an included overview of names***" This sentence gives information about the follow-up e-mails which should guide the norm activation process. It also removes the current anonymity of system usage: the follow-up e-mail will include a list with names. People are more likely to comply with group behavior when there is no anonymity and the behavior is perceived as public behavior.

C) ***You can ask your colleagues <ColleagueA>, <ColleagueB> or <ColleagueC> how they filled in their profile.*** This is a descriptive norm as the sentence implies that *similar colleagues* (same service line and preferably same function level) have already filled their profile.

9 Field experiment

This chapter presents the field experiment. In this field experiment I empirically test if my proposed design actually motivates people to use My Site. And, more importantly, does the proposed intervention perform better than a regular e-mail message?

9.1 Overview of the experiment

The goal of the experiment is to test if people use My Site when providing them normative feedback via an e-mail message. The effect of the experiment will be tested with measuring the amount of extra filled in extended standard profiles. I compare two situations: **just before** (t=0) and **1 month after** the sent date (t = 1) of the e-mails. The t=0 measurement is actually the baseline measurement presented in the previous chapter.

The experiment population contains the low baseline users of My Site (P&T and R&C). Low baseline users are users that did not extend their standard profile yet. There are about 160 low baseline users: about 40 persons of P&T and about 120 persons of R&C. The high baseline users are excluded for the scientific experiment as they cannot extend their profile anymore. Also sending the high baseline users an e-mail risks possible spillover effects. High baseline users could engage in peer pressure on low-baseline users. If this would be a regular intervention, and not a scientific experiment, it could of course be beneficial to also e-mail the high-baseline users. In this case, I want to measure solely the effect of presenting normative feedback to individuals.

The low-baseline users (N=160) are divided into two groups: an intervention and control group. The intervention group receives an e-mail similar to the one proposed in the previous chapter. This e-mail contains some general information about My Site and the normative sentences. The control group receives exact the same e-mail, but the normative sentences (A) and (C) are left out. The control group is necessary for the following two reasons:

1) The e-mail itself could be a trigger to extend the standard My Site profile. I want to rule out the effect of the e-mail and other effects by sending the control group an e-mail without the normative sentences.
2) Other effects could for example include natural growth: Every month, one to three profiles are extended, because of people joining the company or promotion of My Site through other channels. I assume that both the intervention and the control group have a similar other patterns in this respect.

In other words, the control group allows verifying whether the normative feedback e-mail performs better than a regular informative e-mail message. As I have seen in the previous chapter, the service groups P&T and R&C differ in their current descriptive norm: P&T has a descriptive norm that is in favor of adopting My Site, while the current descriptive norm of R&C prescribes non-adoption. As a result of the intervention, I will also note if there are any structural differences between these two groups in terms of normative feedback effectiveness.

Table 7 summarizes the experiment population and their respective groups. The exact number of participants in the experiment is 163. These are all people which did not extend their standard profile. The people are randomly allocated (computer algorithm) to the intervention and control group. The intervention group has a total size of 82 people. The control group has a total size of 81 people. In Part IV I will present the results and statistically test with an ANOVA and Student T test if the two populations are different at t=1.

Service Group	**Intervention**	**Control**
P&T (descriptive norm in favor of My Site)	N=21	N=22
R&C (descriptive norm not in favor of My Site)	N=61	N=59
Total	**N=82**	**N=81**

Table 7: Experiment population and groups

9.2 Procedures for data collection and mailing

The statistics for extend standard profiles are collected in the following manner. My Site is a SharePoint implementation that allows for simple queries. On t=0 I performed a query to find all P&T and R&C users and their attributes (photo's, resume's and fields of expertise). After exactly a month after the e-mail I carry out the same query. I can than count the difference in extended standard between the queries to determine the result.

The e-mail is sent for both groups by the responsible Planning Management Lead (PML) person. The PML persons are responsible for job assignments and use the available resume's for this. They are the most logical person for sending an e-mail about the subject of My Site within the Big Four company.

The procedure for the e-mail is as follows. The PML person sends and personal e-mail to both groups with the respective e-mail version. Each person receives a personalized e-mail (i.e. own first name) and is the only recipient of that e-mail. This means that for each individual a unique e-mail is sent and no mass mailing or distribution lists are used.

9.3 E-mails in field experiment

As we know by now, the field experiment contains the intervention and the control group. Both groups received a different e-mail. These original e-mails are written in Dutch. The intervention group received a normative version of the e-mail. This version can be found in Appendix A. The control group received an informative version of the same e-mail. In this case the normative messages have been left out. This version can be found in Appendix B. In this way I could assess the impact of the normative messages sent. The e-mails were sent both to P&T and R&C. The following sentences contained the normative information:

> **Sentence:** "The preliminary results reveal that 66% of the P&T people extended their profile. Service line Sourcing is scoring really well with 93% extended profiles."
> **Explanation:** The goal of this sentence is to provide a favorable descriptive norm that reveals that it is frequent and common to extend a My Site profile. An important remark is that I inflated the norm from 61% to 66% to have a stronger descriptive norm.

Sentence: "The results of the full investigation will be shared later on**"**
Explanation: This sentence is by itself *not* normative. Yet it was included to increase the possible effect. Removing anonymity strengthens the normative effect. This sentence implies that anonymity can be removed. Both the intervention *and* control group received this message.

Sentence: "Ask John Doo, Joe Bar and Foo Doodle why and how they extended their profile"
Explanation: This sentence provides a descriptive norm of similar people as the receiver of the e-mail. Especially for the R&C group, the P&T norm might produce a subsequent lower result. P&T could be perceived as a different group. It demonstrates that similar people also extended their profile.

Sentence: "Unfortunately, you're My Site profile is not up to date**"**
Explanation: This sentence was included for two reasons: (1) this allows for normative feedback. It communicates that somebody is violating the norms. (2) It aligns the descriptive and the subjective norm by the word "unfortunately". This word indicates the disapproval of the sender.

This is it. I discussed the important details of the intervention. After sending the above two e-mails, a month of waiting started. I was curious if the e-mail would produce the expected results. Would this e-mail perform similar to the door hanger in the hotel rooms? Or would the intervention be no better than the control group? Let's quickly summarize the conclusions of Part III, before answering these questions.

10 Conclusions of Part III: Activate social norms to motivate IT usage

I started Part III with the following research question:

> *"How can social norms be used in an organizational intervention to increase individual acceptance of an IT system?"*

With the insights from the previous chapters I can now answer this question: A personalized normative feedback intervention should activate social norms for IT usage. There are five key activities to consider when designing such an intervention: (1) define IT use (2) determine the baselines, (3) develop measures, (4) personalize messages and (5) communication of the norm. There are some key aspects to consider when presenting normative feedback such as boomerang effects, norm salience and anonymity of behavior.

I demonstrated how this normative feedback design can be translated into an organizational intervention. I applied this design to develop an intervention for My Site. The proposed field experiment will test the intervention. The goal of the field experiment is to validate the intervention design.

In the following part, Part IV, I will present the results of the described field experiment. These results demonstrate whether the intervention is successful, and, more importantly, whether the intervention is performing better than a regular informative e-mail.

Part IV: Results of the proposed organizational intervention

11 Results of field experiment

In this chapter I present the results of the field experiment proposed in Part III. The goal of the field experiment is motivating My Site usage in a Big Four company. A special e-mail was constructed according to the proposed intervention design based on literature. This intervention e-mail contained normative messages. Hypothesized is that the normative messages in the e-mail activate social norm mechanisms. These mechanisms should in turn lead to a higher amount of useful profiles on My Site.

The targeted IT consultants within the company were sent an e-mail. Half of them were randomly assigned to the intervention group, and the other half were randomly assigned to a control group. The control group received nearly the same e-mail message as the intervention group, but the normative messages were left out. The results are measured exactly one month after sending the e-mails. The total sample size of the field experiment prior to the field experiment was 162. Some people left the company during the month of the experiment. These consultants are discarded from the sample. This resulted in a total number of 155 consultants.

The e-mail of the intervention group produced a *significant* increase in amount of extended My Site profiles relative to the control group. Figure 9 shows the difference between the intervention group and the control group. 35% of the consultants in the intervention group extended their standard profile, while 21% of the control group extended their profile. This means that the intervention group outperforms the control group by factor 1,67.

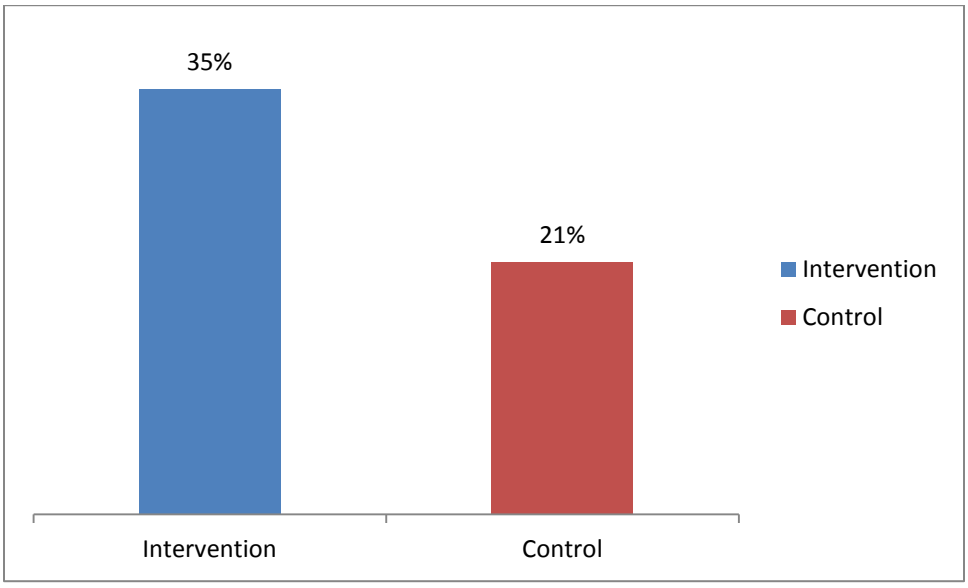

Figure 9: Difference between amount of extended My Site profiles (Intervention group versus Control group)

Table 8 describes the statistics of the experiment. To test the significance of the intervention I used a Student t-Test. The values are discrete; either a person did or did not extend his profile. I compared the means of the intervention (0,35) and of the control (0,211) group with each other. I used a confidence level of 95% (alpha = 0,05). In the case of this intervention an one-tailed T-test is appropriate: I want to know if the mean of the intervention group is significantly bigger than the control group. This clearly seems the case as the result of the one-tailed test is 0,0234 which is smaller than 0,05.

t-Test: Two-Sample Assuming Unequal Variances		
	Intervention	*Control*
Mean	0,35443	0,210526
Variance	0,231743	0,168421
Observations	79	76
Hypothesized Mean Difference	0	
df	151	
t Stat	2,005347	
P(T<=t) one-tail	0,023356	
t Critical one-tail	1,655007	
P(T<=t) two-tail	0,046713	
t Critical two-tail	1,975799	

Table 8: t-Test: Two-sample assuming unequal variances

The overall results of the field experiment seem to be quite clear. However, I am also interested in possible differences among subgroups. Remember that with the description of the target group, I identified the groups P&T and R&C. The baselines of those groups were different. The P&T group had a descriptive norm in favor of using My Site, while only 17% of the R&C consultants did extend their profile. In the next two sections I separate the results of these subgroups.

11.1 Subgroup P&T: High-descriptive norm prior to intervention

This section details the results for the subgroup P&T. This P&T group had a favorable descriptive norm in favor of using My Site prior to the intervention. 61% of the consultants did already extend their standard profile. The total number of consultants in the P&T sample was exactly 40 people. 21 of them are part of the intervention group, while the other 19 are part of the control group.

The increase of extended My Site profiles is also *significant* relative to the control group within the P&T sample only. Figure 10 depicts the results for the P&T group. More than half (52%) of the intervention group did extend their profile. From the control group 26% did the same. This means that the intervention group outperforms the control group by double. This is a bit stronger than the overall result of the field experiment. Interesting is that the effect for both groups is substantially stronger but proportionally the same. So both in the intervention and the control group more people extended their profile.

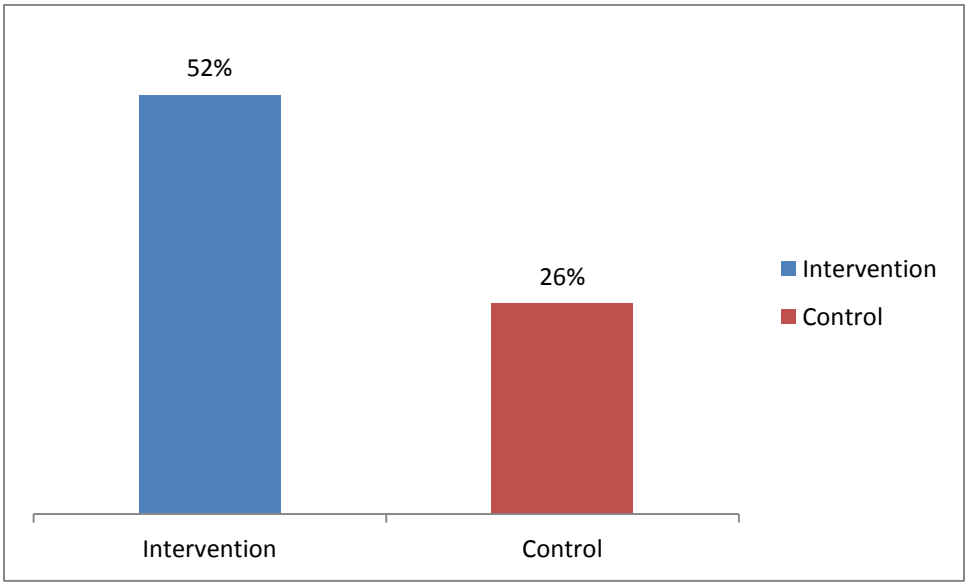

Figure 10: Results field experiment for subgroup P&T (intervention group versus control group)

The statistics for the P&T sample are displayed in Table 9. I again tested whether the intervention and control population means are different. The result of this test demonstrates that in fact the means are significant different. Similar calculations are used as for the general field experiment. The one-tail critical student T-test is passed with factor 1,71. I use a confidence level of 95% (alpha = 0,05). In the next section I continue with the other group.

t-Test: Two-Sample Assuming Unequal Variances

	Intervention	*Control*
Mean	0,52381	0,263158
Variance	0,261905	0,204678
Observations	21	19
df	38	
t Stat	1,709634	
P(T<=t) one-tail	0,047744	
t Critical one-tail	1,685954	

Table 9: Student T test for field experiment with only P&T sample

11.2 Subgroup R&C: Low-descriptive norm prior to intervention

The second group within the population of the field experiment is R&C. In contrast with the previous group, R&C had a non-favorable descriptive norm towards the norm. Only 17% of the R&C group already extended his/her profile prior to the experiment. This means that this intervention risks possible boomerang effects. The total remaining sample size of R&C is 115 consultants.

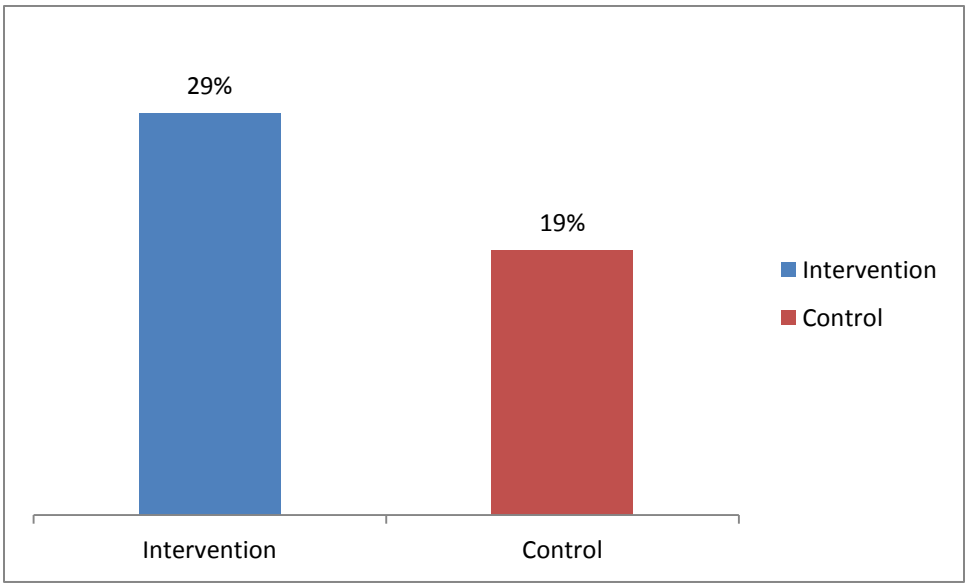

Figure 11: Results field experiment for subgroup R&C (intervention group versus control group)

Figure 11 displays the results for the subgroup R&C. The intervention group outperforms the control group again. However, in this case although the difference is in the expected direction, there is not a significant result (0,11 > 0,05) as seen in Table 10. The non-significance is related to the lower effect size. Both the intervention and control group in the P&T case scored much higher. The discussion in the next section touches upon possible explanations for this difference.

t-Test: Two-Sample Assuming Unequal Variances

	Intervention	*Control*
Mean	0,293103	0,192982
Variance	0,210829	0,158521
Observations	58	57
df	111	
t Stat	1,249946	
P(T<=t) one-tail	0,106974	
t Critical one-tail	1,658697	

Table 10: Student t-Test results for subgroup R&C

12 Discussion of the results

The aim of the field experiment was to test normative messages in an IT setting. The overall results support the idea that social norms can be used to motivate IT use. More than 1 out of 3 persons extended their profile in the intervention group versus about 1 out of 5 in the control group. This strengthens my idea that the proposed intervention is indeed useful for managers. However, an important remark has to be made. The concept *IT use* in this study comprises a discrete action: either somebody did or did not extend his profile in an IT system (according to the definition I gave earlier). This definition is chosen as the system is only valuable with extended profiles. I did not measure hits or the amount of people who searched the system. Other definitions could possible lead to different results in both directions. For example: There were several people that *did* extend their profile, but not at the required level to qualify as an extended profile. They only provided a photo and/or fields of expertise and not a complete CV. These people responded to the e-mail, but have *not* been taken into account in the results. One could argue that the total effect is bigger than the reported results. Similarly, the effect could be weaker when taking into account other variables. For example, unknown is what the effects are for repeated usage. Do people keep their profile up to date? Or are more messages required? Further research is needed to assess the effect of social norms on broader definitions of IT usage.

The results are in line with earlier results from literature. I hypothesized that my intervention would be line with the discussed interventions such as towels in hotel rooms (Goldstein et al., 2008), home energy consumption (Schultz et al., 2007) and theft of wood pieces (Cialdini et al., 2006). In these interventions the effect size was on average 25%-30% compared to the baseline. This study shows an increase of 35% in desired behavior. Of course, the studies are not fully comparable. In those studies the full group (both high and low-baseline) received the normative message and the effect size was measured. In this study the term *conversion* is more applicable. 35% of the low-baseline users were converted to persons with an extended profile.

A less important, but interest finding is that e-mail qualifies as a medium for normative messages. The results suggest that personalized e-mails can also be used for normative feedback campaigns. This is an addition to the already known medium such as posters (Neighbors et al., 2006) signs (Cialdini et al., 2006), door hangers (Goldstein et al., 2008; Schultz et al., 2007) and audiotapes (Mahler et al., 2008). In the discussed interventions on normative feedback no e-mails were used. This finding support earlier research of Guadagno & Cialdini (2002) on online persuasion. They found that online messages on websites and e-mail elicit the same reactions to persuasion in a face-to-face setting. This study adds the idea that also normative information can be provided by e-mail. However, there is a gender bias in the findings of Guadagno & Cialdini (2002). The finding was most viable for males. Females respond stronger to face-to-face persuasion. I could not replicate this gender bias in this study as most consultants in the Big Four firm are male.

There are two issues that deserve further elaboration. The first issue relates to the subgroup differences between P&T and R&C. The baseline assessment already revealed that P&T and R&C are structurally different. Also the subgroups produced a different result. The second issue is the role of descriptive

norms in IT acceptance literature. The literature review demonstrated the absence of descriptive norms in TAM. In addition, it was concluded in the literature that especially the role of social norms in cases of voluntary IT situations is weak. I use the results to shed additional light on these issues in the coming two sections.

12.1 Subgroup differences: norm activation works in IT settings

The subgroup differences between P&T (high descriptive) and R&C (low descriptive) can be explained with some additional hidden information in the data I generated. I found this explanation during my analysis of perceived similarity. Prior to the experiment, P&T had a favorable amount of extended profiles of 61%, while R&C had a non-favorable amount of profiles of only 17%. Therefore, I introduced and developed an additional descriptive norm. I mentioned three similar colleagues for each low-baseline user. The idea of this addition was to present the use My Site as common and frequent by similar persons. After analyzing the results, I was curious if there was a correlation between the colleagues mentioned in the e-mail and the respective result of that user. The analysis showed that there is *no correlation* between the names mentioned in the e-mail and the actual results of that user.

The best predictor of extending profiles on My Site is the average behavior of *all* similar peers in somebody's environment. Consultants extended their profile when more similar or close colleagues already did so (regardless of the names mentioned in the e-mail). How can I proof this? I can actually use my earlier presented similarity scoring scheme for this. For each dyad the similarity score is known. I can sum up all dyad scores of a person. The higher score, the more direct colleagues did already extend their profile. Let's explain this by means of an example: Peter did not extend his profile prior to the experiment. We know his "similarity" score with all the colleagues that did this. By summing up the score of Peter and all his dyads, we know his "total similarity" score. After I did this, I noticed that the higher the "total similarity" score of a person, the more likely he extended his profile. Figure 12 depicts the relationship between behavior of similar people and the results. I aggregated the individuals in the categories low, medium and high perceived similarity.

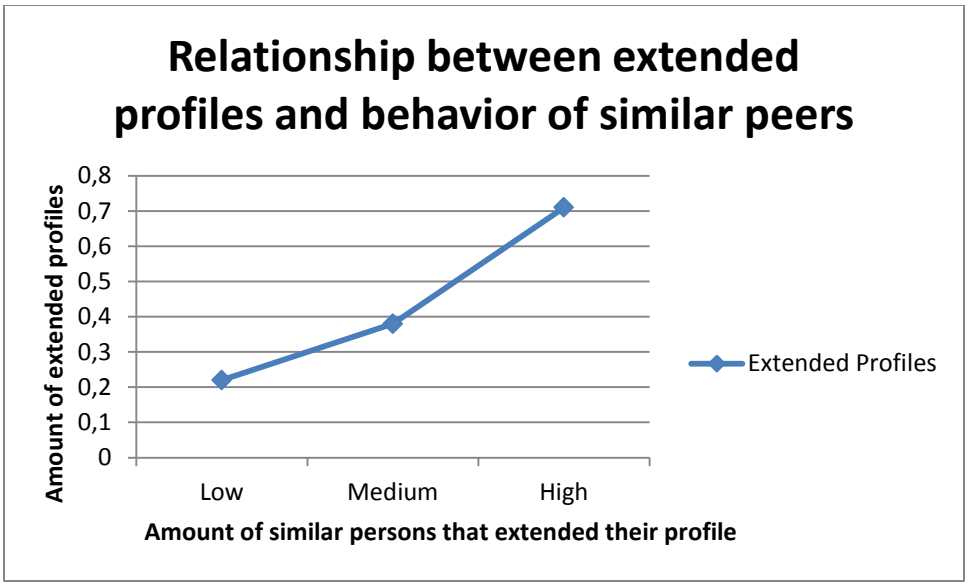

Figure 12: Relationship between extended profiles and behavior of similar peers

This relationship is an important finding, because it demonstrates that my proposed intervention does activate social norm mechanisms. Apparently the e-mail triggers people to take note of the actual behavior of their similar peers. In this way they correct their perceptions of the descriptive norm. They find out about the behavior of similar colleagues to see if they extended their profile. This is line with the idea that individual IT adoption depends upon an individual's embedding in a social network (Sykes et al., 2009) and also that peers play an important role in IT adoption (Jasperson et al., 2005). Through processes of peer support, peer pressure and word-of-mouth people take note and appropriate the IT system.

Last but not least, this relationship allows us to explain the subgroup differences between P&T and R&C. The similarity scores of P&T persons were on average much higher than those of R&C persons. Furthermore, R&C persons were mostly classified in the low similar peers group, while most P&T persons were classified with a medium to high similarity score for their peers. This can numerically explain on individual level why persons within a certain group use the IT system. The norm activation process works by means of the e-mail, but has a much stronger effect in the case of P&T. The norm was backed up by behavior in reality. This was not the case for the people in R&C intervention. When asking around or browsing of profiles similar colleagues, people found out that most of their peers did not extend their profile.

12.2 Including descriptive norms in TAM

Based on the results of my experiments, I argue that descriptive norms should be considered as an additional predictor of IT use. Both the evidence from literature and the results of this study point into this direction. Hence it is highly likely that descriptive norms can help to explain additional variance in many IT acceptance studies, in particular in voluntary settings. Descriptive norms should, therefore, be added to TAM models.

The evidence from literature can be extrapolated from current advancements in TPB studies. After all, the predecessors of TAM and TAM2 are the TRA and TPB models. Descriptive norms are already acknowledged as an additional predictor in updated versions of the TPB model (Rivis & Sheeran, 2003). The meta-analysis by Rivis & Sheeran (2003) has demonstrated that there are strong correlations between descriptive norm and intentions. Therefore, Rivis & Sheeran (2003), in line with Sheeran & Orbell (1999) and White (2009), argued that descriptive norms should be included in the TPB. The rationale for this is the following: The original conceptualization of social influence in TRA/TPB/TAM2 only accounted for *normative* influence. This can be considered as a narrow conceptualization of social influences and this is especially problematic in situations of voluntary behavior. Descriptive norms are a form of *informational* influence. The meta-analyses in literature by both Rivis & Sheeran (2003) and Manning (2009) validated the considerable amount of studies testing descriptive norm in the context of TPB. Venkatesh (2002) argued that the subjective norm should be included in the TAM2 model since the TPB model has been improved with a new conceptualization of social influence (descriptive and subjective norms). It seems only a logical step to acknowledge these advancements and update the TAM2 model.

Also the results in this particular study suggest that descriptive norms should be considered as an additional predictor in TAM since the results strongly suggest that descriptive norms (in combination with aligned subjective norms) in particular enhanced IT use in this case. I am in the position to argue this because prior to the intervention I asked a few people to fill out the TAM questionnaire (including descriptive norms) as a diagnosis tool for myself. Both subjective norm and perceived usefulness of the system scored about 4 on a 5 point scale and seemed to be high prior to the experiment. The descriptive norm scored a bit too low in comparison with the actual usage in the case of P&T. The intervention possibly corrected this misperception and told people about the most accurate behavior. Furthermore, the results of my study suggest that descriptive norms also operate in voluntary settings. My Site certainly qualifies as a voluntary system. The initial adoption rate of 17% at R&C illustrates that the system is by no means mandatory. From earlier studies it was concluded that social norms might not be a good predictor for voluntary IT use. (Hartwick & Barki, 1994; Venkatesh & Davis, 2002). This study helps to proof that social norms, and in particular descriptive norms, *do also* operate in a voluntary IT usage setting.

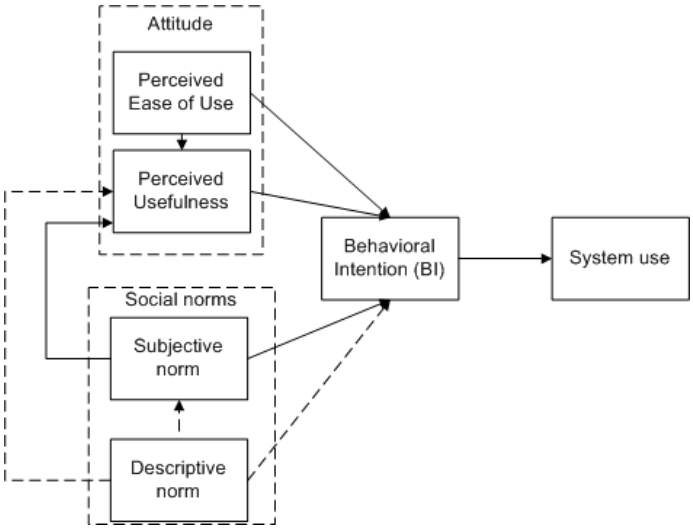

Figure 13: Extended TAM model for IT usage (Based on: Davis, 1989, Venkatesh, 2000 & Rivis, 2003)

Both the recent advancements in TRA and TPB studies and my own study suggest that descriptive norms should be included in the TAM model? Figure 13 depicts my proposed and extended version of the TAM model. This is a modified version of TAM2 with the inclusion of descriptive norms. The constructs perceived ease of use and perceived usefulness are the main components of attitude that predict Behavioral Intention (BI) which in turn predicts System Usage. Descriptive norm and subjective norm together span the conceptualization of social norms. Both descriptive norm and subjective norm influence perceived usefulness and behavioral intention.

The three dotted lines denote the additional relationships in the new TAM model. Each of these relationships should be verified in future research:

1) Descriptive norms predicting Behavioral intention
2) Descriptive norms predicting Perceived Usefulness (Attitude)
3) Descriptive norms predicting Subjective norm

The inclusion of descriptive norms in TAM is not common yet. Especially the first relationship is new. In an interesting study by Hsu and Lu (2004) extended TAM with descriptive norms as a predictor of behavioral intention. Their application area was not voluntary use of IT systems, but online gaming.. They referred to descriptive norms as "perceived critical mass". They concluded that descriptive norms both predict intention (relationship 1) and attitude (relationship 2):

> *"Social influences, including perceived critical mass [descriptive norms] and social norms [subjective norms], significantly and directly, but separately, affected attitudes and intentions.. .Our findings indicated that social norms and perceived critical mass dominated users' behaviors".*

Some scholars even argue that descriptive norms directly influence behavior, and thus not meet the mediating factor of intention. The idea is that descriptive norms are a social cue and trigger that are not

fully mediated by intention, subjective norm and attitude. Göckeritz et al. (2010) argue that descriptive norms are a decision heuristic that operate through peripheral routes. This means that the information provided by the descriptive norm is not fully deliberately processed (Petty & Cacioppo, 1986), but instead is somehow implicitly used in decisions (Nolan et al., 2008). The possible direct relationship between descriptive norms and system use is not included in the model yet, but shows another venue for future research. The results in this study do the same. I invite scholars to validate the addition of descriptive norms in future TAM studies.

13 Conclusions

Many IT implementations are still considered unsuccessful (Venkatesh, 2008). Although IT investments often promise more efficiency and effectiveness, they can also increase costs. One of the key reasons for the failure of such IT investments is low adoption and use of IT systems (Venkatesh, 2008; Devaraj & Kohli, 2003).For this reason, the development of interventions that could maximize IT adoption and use is crucial (Venkatesh, 2008; Jasperson et al., 2005; Carter & Zmud; 2005). The key factor I have explored in this thesis which might help to maximize IT use is social influence. This factor is undervalued in IT acceptance and usage literature (Orlikowski & Yates, 2003). Therefore, the central question posed in this master thesis was:

> *What is effective use of social norms in an organizational intervention for increasing individual user acceptance of IT systems?*

After presenting and discussing the results of this study, I can finally reflect on this main research question. The first important aspect of this question is: *What is effective use of social norms?* Literature revealed the phenomena of personalized normative feedback. Social norms can be activated through presenting people normative messages. How does this activation and feedback work? The presented normative messages contain descriptive norms. This is a description of what is commonly done in a given situation. One's deviation from the norm is made explicit with the appropriate value. This appropriate value is the alignment of subjective norm with the descriptive norm. People will try to gap the bridge between their behavior and the norm to conform to the group or behave appropriately.

The second part of interest in the research question is *organizational interventions*. In this study I have provided a generic design for a normative feedback intervention. This generic design can be used by managers to design their own normative feedback intervention. This design is derived from the various normative feedback interventions in literature. It contains five activities: (1) define IT use (2) determine the baseline, (3) develop descriptive norm, (4) personalize messages and (5) communicate the norm. Each of these activities has some key aspects to consider. This generic design is validated in the field experiment.

The final part of interest in the research question is: *increasing individual user acceptance*. I empirically tested the increase of user acceptance in a field experiment. The results of this field experiment strongly suggest that the proposed organizational intervention does increase IT use. 29% of the participants in the intervention group were motivated to extend their profile on a corporate linked-in system. These results are also statistically significant relative to the control group.

With these three parts together I can now successfully answer the main question. The main conclusion of this research is that social norms *do* motivate IT usage. This in line with the earlier reported findings on social norm interventions. This and many other studies successfully employed social norms to improve desired behavior. Furthermore, I successfully designed an organizational intervention that employed social norms. This organizational intervention did result in increased IT usage. So I can also include that the proposed intervention has practical value. Managers can use it as a hands-on tool to successfully increase their own IT adoption rates.

Another significant conclusion is the importance of the actual behavior of similar peers for normative interventions. It seems that actual behavior of similar peers moderates the strength of the effect size. Goldstein et al. (2008) already showed that with the towel-reuse experiment that the best message was the one that had, as they put it the most *provincial norms*. The message said that: *75% in THIS ROOM re-used their towel*. In other words: this message demonstrated that normative information is most effective when the norm refers to *similar* people. In the case of the hotel towel re-use, people cannot verify this information by asking guests that stayed prior in that room. In the case of IT, people can verify whether colleagues use the system as well. No other studies did do address this issue in-depth yet. In my study the role of actual behavior seemed to be important. The difference between the subgroups P&T and R&C can be explained with the actual behavior of similar peers and especially the difference in *effect size*. The effect for P&T was much larger, because people could actually find many similar peers that did use the system.

13.1 Limitations

This study has two important limitations. The first limitation is the narrow definition of IT use in this study. IT use in this study comprised a single action. Either a person extended or not extended his/her profile on My Site. One can imagine more complex IT systems with richer usage behavior. Examples of more complex and enterprise critical systems are ERP and CRM systems. The adoption of such systems is more comprehensive than single use. These systems are used repeatedly and most likely on a daily basis. While the results of this study demonstrate that social norm interventions can motivate single use of IT, it is unknown whether they can be generalized for repeated or more complex IT use. However, norm interventions proofed to be successful for repetitive behavior such as home energy consumption, drinking and littering. These studies suggest a similar fate for norm interventions in repeated IT use settings.

The second limitation is that this study is non-longitudinal. It does not assess time effects. I measured the results in a single time frame of a month. The results do not predict whether people will continue to update and use the system after my intervention. Since the current literature revealed that norm activation takes time, it is likely that for longer lasting effects repetition is important in norm interventions. This study does not provide insights in how to intervene in longitudinal processes. For example, do we need only one follow up e-mail? Or do we need an e-mail every week?

The limitations show that it is hard to generalize this study to any kind of IT use. IT use in this study comprised a discrete action in a single case. No time effects or repeated usage are taken into account. At the same time this study has proven that normative feedback interventions can produce significant results in IT settings. In the two sections below I will explore the implications of the results of this study for theory and practice.

13.2 Implications for theory and future research

As a result of this study, I argue that descriptive norms should be included in TAM. TPB studies and especially the meta-analysis by Rivis & Sheeran (2003) already have shown that descriptive norms are an important predictor of human behavior. While Venkatesh & Davis (2002) argue that the construct subjective norm confines social influence in IT settings, they consider the subjective norm-intention relation as very weak in voluntary situations in their TAM2 model. This would suggest that social influence as a whole is weak in voluntary situations or fully moderated by the other variables. This suggestion is not supported by the results of my research. Future research could focus upon further validating the inclusion of descriptive norms in TAM. Also the standard TAM questionnaires need to be extended with the appropriate descriptive norm questions.

An interesting other direction for future research is the conceptualization of IT usage. One could argue that this study mainly looks upon single use of IT. In this study the definition of IT usage is limited: either you did or did not extend your profile. In this study I compared the baseline and the effect after one month. We do not know whether my intervention leads to repeated usage. Social norms literature (Schultz et al., 2007) suggests that norms and in particular descriptive norms take some time to activate. Therefore, it could be the case that the effect increases with repeated messages. More longitudinal studies could focus upon the effect of repeated exposure to normative messages and other conceptualizations of IT. The effect of repeated usage is as of yet unknown. Do people keep their profile up to date after receiving repeated normative messages?

A third direction for future research is the role of anonymity and norms in relationship with IT usage. Neighbor (2004) and many of his colleagues demonstrated the strong effect of misperceptions about how much every person drinks for drinking behavior of students. Overestimating others behaviors can thus have huge consequences for one's own behavior. This is also possible with some type of IT systems. I argue that in some cases you do not have a correct estimate or clue about how much other people use IT systems. Removing anonymity in this case can help to release the power of normative influence. The famous experiment of Solomon Asch (1956) already showed the importance of removing anonymity for normative behavior to kick in. Future research is needed to determine to the exact effect of removing anonymity of IT behavior. Would publicly publishing all usage information of company members increase the effectiveness of the intervention?

The last idea for future research has to with a limitation of this research. This intervention is only tested in a corporate setting of a Big Four company. We do not know to what extend the culture of this company and the gender bias (predominantly male) affect the results. Other research could verify whether the intervention holds in other company settings.

13.3 Implications and recommendations for practice

One of the goals of this study was to make a contribution to practice. This was one of the reasons to do my research in a Big Four company. In addition, an important critique of TAM is the lack of practical applicability. IT adoption can only be improved if managers have hands-on tools. Most managers do understand that behavior is determined by *Perceived Usefulness, Perceived Ease of Use* and *Subjective Norm*. As Venkatesh & Bala (2008) and Jasperson et al. (2005) have argued, nothing will change unless concrete intervention tools become available which can help managers to improve IT adoption.

This study offers a contribution to practice by means of the development of a generic design for an intervention tool. The generic design enables practitioners to perform normative feedback interventions on their own. I demonstrated how I used this generic design to build the specific My Site Intervention for the Big Four company. With the generic design, managers can make their own translation of the design to their specific situation. The proposed intervention is also scientifically tested and this can be used to convince the general company management to allow their managers to try it out.

Managers should first define a clear definition of IT usage. What is the exact goal that they want to accomplish? Subsequently they can perform the four activities (1) determine the baseline (2) develop descriptive norm (3) personalize messages (4) communicate the norm. For each of these activities I pointed out the crucial elements. The most important ones are preventing boomerang effects, and the use of perceived similarity and avoidance of anonymity.

The strength of the intervention depends upon the critical mass that is already present. If you can postpone this intervention a little bit and gain a few extra users, you increase your effect. Does this mean that there are no interventions possible when the majority of the users are *not using the* system? Of course not, but it is clear that in such situations repetition and thus more time is needed. If I would repeat the same intervention again in the case of R&C for My Site we could probably produce stronger results. Prior to the field experiment only 17% extended their profile. This amount doubled with the control group and intervention group combined. This means that if we would run the intervention again, people have on average 34% similar colleagues that already extended their profile! This is also in line with the idea that repetition of normative information helps to activate the norm. People take note of the fact that other people responded to the prior intervention as the amount doubled.

I would strongly recommend managers to extend the intervention with several elements I have seen in the other interventions. It was not possible to include these elements in my theoretical test of norms. Still, I propose the following extensions:

- E-mail the normative feedback also to high baseline users. They should of course be told they are doing the right thing (alignment of subjective norms), but they could also be asked to spread the word and mention it to colleagues. This way the normative information and social norms can also benefit of "peer pressure".
- Send repeatedly the normative information. Send people periodical updates, and do keep people informed about the norm. Norms take some time to activate. Repetition can help this process.
- In line with the famous experiment of Asch (1956), remove anonymity to fully benefit from the power of normative influence. This is not a mandate to start a process of blaming and shaming of people for not use their IT systems, but when used with caution, the removal of anonymity can make people aware in a subtly way of the behavior of others, and this will influence theirs !

And of course, the proposed intervention by itself will not solve all IT adoptions problems or magically bump IT adoption through the roof. The TAM model shows clearly that there are other important factors to consider as well. The quality of the system, culture, the style of leadership and even the weather contribute to human decision making. Social norms are just one factor in the complex mystery of human decision making and behavior. Yet at the same time, the proposed intervention allows for an easy but effective way of improving adoption rates.

Are you one of the 80% that enjoyed reading this?

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Part V: Appendices

Appendix A: E-mail for intervention group

Onderwerp: Veel CV's op My Site

Hallo Hans,

Binnen KPMG is vorig jaar My Site geïntroduceerd. Dit is het globale systeem voor persoonsinformatie van KPMG. Je kan het vergelijken met een corporate LinkedIn. Wij willen mensen stimuleren om een actueel CV op hun My Site profiel te zetten. Actuele CV's kunnen ons helpen om jullie snel en efficiënt bij klanten voor te stellen.

Binnen IT Advisory NL (P&T en R&C) doen we onderzoek naar het huidige My Site gebruik. **Uit dit onderzoek blijkt nu al dat 66% van de referentiegroep (P&T) een actueel CV heeft. Een goed scorende service line is "Sourcing" met 93% actuele CV's.**

In februari worden de resultaten van dit onderzoek gedeeld met alle ITA leden. **In deze update kan je zien hoe compleet je profiel is in vergelijking met je collega's en andere service lines.**

Helaas is op jou My Site nog geen actueel CV aangetroffen. Binnen KPMG vinden we het belangrijk dat er een actueel CV op My Site staat. Wij willen je vragen om je profiel goed in te vullen met een actueel CV, profielfoto en expertisegebieden.

Vraag anders eens aan Aldwin Wijnveld, Koen Dongelman of Alex Bins hoe zij dit gedaan hebben. Gebruik bij het invullen de globale CV template uit de handleiding hieronder.

Hier vind je een handleiding om je MySite in 4 eenvoudige stappen te vullen:
http://hier-stond-een-link-naar-de-handleiding

Op naar een ingevuld profiel!

Groeten,

Peter

PS: Een manier om My Site te vinden is:
Rechtermuisknop op je eigen naam in een Outlook e-mail > View My Site

Appendix B: E-mail for control group

Onderwerp: Invullen My Site profiel

Hallo Arjan,

Binnen KPMG is vorig jaar My Site geïntroduceerd. Dit is het globale systeem voor persoonsinformatie van KPMG. Je kan het vergelijken met een corporate LinkedIn. Wij willen mensen stimuleren om een actueel CV op hun My Site profiel te zetten. Actuele CV's kunnen ons helpen om jullie snel en efficiënt bij klanten voor te stellen.

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Wij willen je vragen om je profiel goed in te vullen met een actueel CV, profielfoto en expertisegebieden. Gebruik hierbij de globale CV template uit de handleiding hieronder.

Hier vind je een handleiding om je MySite in 4 eenvoudige stappen te vullen:
http://hier-stond-een-link-naar-de-handleiding

Op naar een ingevuld profiel!

Groeten,

Peter

PS: Een manier om My Site te vinden is:
Rechtermuisknop op je eigen naam in een Outlook e-mail > View My Site

Appendix C: Query for finding similar colleagues

I was given several Excel sheets with the raw database data of the target group. I converted this Excel data into a Microsoft Access Database. The conversion to a database scheme allowed me to perform database queries and operations on the provided data. Subsequently, I developed the MSSQL below. The query was used to find similar colleagues. The query below can be used in modified form to find similar colleagues in other settings.

The query did the following specific things:

- Find a combination of three colleagues that are in the same department and have a resume on My Site;
- Score each of these colleagues with points on how well they match:
    - If Department, Office and Title match 2 points;
    - If Department and Office match 1 point;
    - If only Department matches 0 points;
- Order the combinations of colleagues based on scores. In the best case this means an 2-2-2 combination on top, and the 0-0-0 combinations on bottom;
- If there are multiple best options (e.g. more than one combination scoring 2-2-2) than order randomly between these similar best options. In this way we get different e-mails for each individual.

MSSQL QUERY

```
SELECT [1].UserName, [1].Name,
[2].Name AS person1, [3].Name AS person2, [4].Name AS person3,
Switch([1].Title=[2].Title,"2",[1].Office=[2].Office,"1",[1].Department=[2].D
epartment,"0") AS Expr5,
Switch([1].Title=[3].Title,"2",[1].Office=[3].Office,"1",[1].Department=[3].D
epartment,"0") AS Expr1,
Switch([1].Title=[4].Title,"2",[1].Office=[4].Office,"1",[1].Department=[4].D
epartment,"0") AS Expr2

FROM [MasterTable - 29Nov] AS 1, [MasterTable - 29Nov] AS 2, [MasterTable -
29Nov] AS 3, [MasterTable - 29Nov] AS 4

WHERE ((([1].hasResume)=0) AND (([2].hasResume)=1) AND
(([1].Department)=[2].[Department]) AND (([3].hasResume)=1) AND
(([2].Username)<>[3].[Username]) AND (([3].Department)=[1].[Department]) AND
(([4].hasResume)=1) AND (([4].Username)<>[3].[Username] And
([4].Username)<>[2].[Username]) AND (([4].Department)=[1].[Department]))

ORDER BY [1].UserName, [1].Name,
Switch([1].Title=[2].Title,"2",[1].Office=[2].Office,"1",[1].Department=[2].D
epartment,"0") DESC ,
Switch([1].Title=[3].Title,"2",[1].Office=[3].Office,"1",[1].Department=[3].D
epartment,"0") DESC ,
Switch([1].Title=[4].Title,"2",[1].Office=[4].Office,"1",[1].Department=[4].D
epartment,"0") DESC , Rnd();
```