

# How to keep IT professionals?

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## A multiple-constituency review of organizational retention factors

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"It's hard to get good people, and even harder to keep them."

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## **PREFACE**

This last project marks the completion of my Master of Science in Business Administration and has been both a great challenge and a learning experience for me. This thesis also marks the conclusion of my time at the University of Twente in Enschede, where I have made many friends and been granted the opportunity to enroll in an exchange program at Hong Kong Polytechnic University.

Computer Science and Business Information Technology were what I first studied, and as such Information Technology has always interested me. This study on retaining Information Technology professionals will be useful for my future career and has been interesting for me because of its relevance to the Information Technology field.

My thanks go to my supervisors Dr. E. Furtmueller and Prof. Dr. C.P.M. Wilderom for supporting me on the path towards finishing my thesis. Also, I want to thank my family; my gratitude goes out to my parents, my sisters Yu Chieh Jung and Yu Choo Jung and my brothers-in-law Geert Onderwater and Ling Wu for their support and encouragement during the challenging process of writing my thesis. Special thanks go to my proofreaders Sybren Hazenberg, Wezley Meek, Hugh Cripps and Joe Cowan and my editor Ann Jensby for helping me improve the quality of my paper. Finally, my thanks go to all my other friends who have supported me during the writing of my thesis.

Thank you everyone!

Yu Chao Jung

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## ABSTRACT

**Purpose:** The purpose of this paper is to analyze factors that motivate IT professionals to stay productively working in an organization. By analyzing in-depth interviews with young IT professionals (while considering the current economic climate) this study aims to add new insights to the employee retention literature.

**Methodology:** Since retention of IT professionals is studied in various disciplines such as Information Systems, Psychology, Organizational Behavior and Human Resource Management, we first carefully selected the most relevant scholarly articles on the subject and derived a theoretical overview of state-of-the-art knowledge on employee retention factors. Following this, interview data with 21 young IT professionals was analyzed and compared to the literature. A content analysis of the most frequently identified retention factors in the interview and literature data enhance the understanding of salient concepts in retaining IT staff. Talent management, human capital theory, self-determination theory and a multiple-constituency approach have been examined for their usefulness in the analysis of this study's findings.

**Findings:** The literature analyses and review of the interview data revealed that IT professionals differ in notable ways from other employees in the factors that keep them at an organization. Additionally, IT professionals have been demonstrated to have preferences and values related to retention that go against the stereotype of IT professionals.

Combining the literature and interview data analyses, we identified eight specific retention factors that motivate IT professionals to stay effectively working with their employing organizations. These are: organizational factors, job characteristics, career advancement, financial compensation, personal development, recognition, job security, and benefits. IT professionals' individual characteristics influence various retention factors directly or moderate these factors. For example, IT professionals' relationship orientation (the degree to which an individual rates social elements in the work environment as important) moderates the importance of social elements in retaining the particular professional.

Talent management, human capital theory and self-determination theory and a multiple-constituency approach have been found to contribute to the understanding of the needs of IT professionals to stay at an organization. Also, a multiple-constituency approach suggests the perspectives of other actors could be better integrated into the evaluation of IT professionals. This evaluation has been proposed to be possibly helpful in the identification of highly effective IT professionals. Also, a personal development plan created by HR with IT professionals has been proposed as one option to address the above factors and the moderating effects of individual characteristics and improve retention. Additionally, it has been proposed that the economic crisis has perhaps impacted some retention factors for young IT professionals.

**Originality:** Literature on retention has mainly produced quantitative and conceptual research. There has been relatively little qualitative research conducted on retention in general, and specifically less on the retention of IT professionals. This study draws from talent management, self-determination and human capital theory and provides insights into perceptions of young IT professionals---perceptions that may also be seen as reflecting the current economic climate---on relevant factors that motivate them to stay in an organization.

**Research limitations/implications:** Due to the small sample size, the results of this study are not conclusive. However, the comprehensive literature study provides a theoretically grounded framework, which has been compared with the interview data and was used to explain relevant factors in retaining highly effective IT professionals.

*Keywords:* IT professionals, Information Technology, employee retention.

## INTRODUCTION

Retaining highly effective employees (talent) is important for an organization to create a competitive advantage (Niederman et al., 2007; Joshi and Agarwal, 2011) and long term organizational success regardless of the sector in which an organization operates (Groves, 2011; Mcdonnell, 2011). The Information Technology (IT) field is no exception (Hsu et al., 2003).

Furthermore, during organizational restructuring, which often happens during a period of financial crisis in the form of downsizing to cut costs, the high performers often leave the organization first (Mak and Sockel, 2001). Although layoffs yield short-term cost reductions and increase profits, research indicates that layoffs do not have long-term benefit (Groves, 2011). Therefore, retaining high-performing employees during periods of economic hardship could be especially difficult for an organization.

The IT field in particular is facing high turnover (Allen et al., 2009; Coombs, 2009; Ghapanchi and Aurum, 2011). This high turnover causes not only visible costs for recruitment and selection, but also hidden costs (Holtom et al., 2008). These hidden costs include low motivation and the loss of specialized skills and tacit corporate knowledge (Moore and Burke, 2002; Owens and Khazanchi, 2011). This may have a negative influence on productivity and the quality of services provided. Furthermore, literature suggests that these hidden costs cause delays in IT projects (Beecham et al., 2008; Chasserio and Legault, 2009; Coombs, 2009; Hall et al., 2009; Steel and Lounsbury, 2009). Turnover consequently impacts the direct and hidden financial costs for organizations and also influences organizational performance (Felps et al., 2009).

The battle for talent, the so-called ‘war for talent’, has become fiercer in the past decade (Mcdonnell, 2011). This has driven up salaries of highly demanded and skilled employees and made it more difficult to retain these individuals. While in the past organizations relied on previous organizational success, image, good salaries, and interesting and challenging work to attract and retain highly effective employees, research shows that even organizations that fulfilled these requirements must now cope with high turnover (Joshi and Agarwal, 2011). Organizations need more understanding on how to retain demanded employees in the current economy. The IT field is exceptionally challenging given the existing discrepancy between supply and demand of qualified individuals in the IT job market and the expectation that this will not change in the near future (Owens and Khazanchi, 2011). There is no indication that the demand for IT professionals will decrease, yet the number of applicants to IT- related fields of study is decreasing. Consequently, future supply of IT professionals will remain low. This suggests that the discrepancy between supply and demand for IT professionals, which the IT labor market is currently already suffering from, is not likely to improve in the near future (Khazanchi and Owens, 2011; Owens and Khazanchi, 2011). These developments emphasize the significance of retaining IT staff. Since young IT professionals are the future of the labor market, we aim to study perceptions of young professionals on relevant conditions to make them productively work and stay with organizations.

Accordingly, this paper addresses the following research question:

“What factors motivate IT professionals to stay productively working in an organization?”

This paper first provides a theoretical overview of the literature on employee retention and specifically concentrates on retention of IT professionals. Interview data is then analyzed and compared with literature. We draw upon related theories to embed our findings. Talent management and self-determination theory is used to discuss the management and retention of effective employees. Additionally, we draw upon human capital theory and discuss the importance of employee training for retention (Reiche, 2008).

This research is relevant for IT organizations, consulting firms, organizations with an IT department, human resources managers, managers in charge of IT professionals and academics interested in studying and managing retention and IT professionals.

The structure of the paper is as follows. First, an overview of the literature on retention is provided followed by a discussion of the literature on retention of IT professionals. Then the research strategy, including methods for data collection and analysis, is described. Finally the results of this research are presented and we discuss our findings and the limitations of our study and explore various possibilities for future research.

# 1. LITERATURE REVIEW

In this section, the literature on retention is reviewed. First we review state-of-the-art knowledge on employee retention and on the retention of IT professionals specifically. Then, we review talent management theory, self-determination theory and human capital theory to explore the applicability of these theories to further understand the retention of IT professionals, and we discuss the potential contribution of a multiple-constituency approach.

## 1.1 Reviewing retention literature

For over 50 years scholars have studied employee retention. Before the 1980s, theorists focused on the processes involved in the decision-making of individuals regarding whether or not to leave organizations by drawing on psychological theories (Steel and Lounsbury, 2009). In the 1980s researchers started to broaden the perspective of their research to also include contextual variables (e.g., organizational culture, organizational size and reward system), individual conditions (e.g., leadership, interpersonal relations and realistic job preview) and to explore the consequences on both the individual and the organizational levels (Holtom et al., 2008). Furthermore, research disciplines other than psychology were drawn upon to gain new perspectives, such as labor economics and sociology of organizations (Steel and Lounsbury, 2009). In the last decade researchers have begun focusing on individual differences in personality, change-related attitude variables at the individual, group and organizational levels and the interaction between the individual and contextual characteristics. Other trends in the last decade have included investigating the process of leaving an organization and a shift of focus from answering questions about why people *leave* to why they *stay* (Holtom et al., 2008). In the next section of this thesis, major themes and concepts identified in the general retention literature and IT specific retention literature are discussed.

### Management policies

Research on employee retention has shown the influence of management policies on retention (Longenecker and Scazzero, 2003; Holtom et al., 2008; Kyndt et al., 2009), this concerns both organizational factors as well as job characteristics. Organizational factors include among others, perceived organizational support (Griffeth et al., 2000) and perceptions of procedural justice in organizations (Hausknecht et al., 2009) (this includes fair compensation for performed work (Kyndt et al., 2009)). Job characteristics studied in the literature are among others, job satisfaction (Beecham et al., 2008; Holtom et al., 2008) (this includes appreciation of performed work (Paré et al., 2001) and the provision of challenging work (Armstrong et al., 2007)). Other management policies concern levels of pay (Longenecker and Scazzero, 2003; Kyndt et al., 2009; Kwon et al., 2010). These findings suggest that both organizational factors and job characteristics need to be considered in the retention of employees (Kyndt et al., 2009).

The use of high performance work systems (HPWS) such as high commitment work practices has a positive impact on retention and organizational performance. These practices are focused on the performance of individual employees (e.g., participation in decision making, training and development practice, pay for performance, high level of pay, and performance appraisal). The use of high performance work systems were found to increase employee job satisfaction, organizational commitment and trust, which have been associated with higher retention (Kwon et al., 2010).

## **Training**

Literature differentiates between modes of training; job and organization-specific training and general types of training (i.e., training to support becoming flexible and multi-skilled) (Elena, 2001). While job/organization-specific training is more likely to enhance employee retention (Pawlowski et al., 2005; Carayon et al., 2006; Samuel and Chipunza, 2009), general training efforts (e.g., management development training) has been found to enhance employees' market-value and may increase mobility to other organizations (Moore and Burke, 2002; Samuel and Chipunza, 2009). Organizations usually provide general training to employees assuming they will stay in organizations. General training might enable employees to switch to higher positions within the employing organization and motivates them to stay, and possibly the lack of training might be a factor to leave.

In fast-paced and rapidly changing environments, such as the IT field, employees need to keep up with the latest technologies (Beecham et al., 2008; Chasserio and Legault, 2009). In high-tech environments, the impact of human capital on organizational success is important, and even more important than in non-high-tech environments (Unger et al., 2011). However for IT professionals, even organizational-specific training may not be sufficient to retain them. For instance, even though programming languages may be different from each other (they may have different syntaxes), but the basic principles of applying these languages (into a working program) are the same. So even though certain programming languages may be organizational-specific, the competence to apply these skills is transferable throughout programming languages.

## **Job embeddedness**

Research suggests that increasing the job embeddedness increases retention (Holtom et al., 2008; Tanova and Holtom, 2008; Steel and Lounsbury, 2009). Job embeddedness is a concept introduced by Mitchell et al. (2001). This concept entails the degree to which the employee is socially entangled with his colleagues and other activities within the organization (Tanova and Holtom, 2008). The concept of job embeddedness suggests that social elements in the organization are important in employee retention.

## **Career anchors**

'Career anchors' is a term that describes an individual's needs in regard with their careers. This concept may be useful to explain why employees might leave an organization. The career anchors of an employee exemplify what an employee seeks to fulfill in a given employment relationship (Agarwal and Ferratt, 2000; Hsu et al., 2003; Hall et al., 2009). Internal career anchors refer to the values that guide the career of the employee. External career anchors refer to the extent to which the employee perceives that the organization can satisfy internal anchors through benefits and incentives (Hsu et al., 2003). The internal career anchors involve six different aspects: (1) The need of the employee to integrate family and career concerns and to find a balance between the two; (2) The need for long-term employment and security (e.g., employment (job security), financial security and geographical security); (3) The need for accomplishment, and there are three different ways to fulfill accomplishment, which are (a) fulfillment through others (managerial) or (b) fulfillment by themselves, i.e., by developing new products/services or by building an entirely new business enterprise (entrepreneurship), or lastly

(c) fulfillment by dedicating one's self to helping others and contributing to causes (service); (4) the need for autonomy, being free to try new things without constraints from the organization. (5) The need to exercise technical expertise and finally, (6) the need for challenge, i.e., by overcoming obstacles and winning against capable opponents (Hsu et al., 2003).

Research suggests that career anchors also play an important role in the retention of IT professionals. Agarwal and Ferratt (2000) showed empirical proof suggesting that an IT professional's career stage moderates the preferred length of employment and turnover intentions. Chang et al. (2011) suggest that career stage has a profound moderating effect on the career anchors of IT professionals. As IT professionals often eventually gain different functions (from technical to managerial functions) their career needs change as well. Organizations should seek to satisfy individual career anchors in order to retain IT professionals (Chang et al., 2011).

### **Person-organization fit**

The person-organization fit concept (P-O fit) has been also used to explain employee retention. A P-O fit exists when at least one party (either the employee or organization) provides whatever the other party requires and when both have characteristics that fit the other's. More specifically, the needs of the work environment should fit with the expectations of the individual and vice versa, the values of the organization need to match (or come close to) the values of the individual. When there is a close match, the employee is less likely to leave the organization (Coldwell et al., 2008; Allen et al., 2009).

In the IT literature, the P-O fit theory has been used to explore the alignment between work conditions and career anchors, individual qualities, the effect on job satisfaction, career satisfaction, organizational commitment and retention. Research on P-O fit suggests that IT professionals have 'high' growth orientation and seek work environments that promote personal growth (i.e., provide training and employ knowledgeable managers) (Allen et al., 2009). Therefore, this could be of importance in organizational strategy to retain IT professionals (and would warrant further research).

### **Characteristics of the individual**

Previous studies have focused primarily on the relationship between job satisfaction, organizational commitment and the intention to leave (Carayon et al., 2006; Kyndt et al., 2009). This type of research is mainly concerned with the individual's intention to leave and the antecedents that lead to job satisfaction (Griffeth et al., 2000). Not surprisingly, job satisfaction has been shown to be correlated with higher employee retention (Lee, 2004; Niederman et al., 2007). Previous research indicates that the following factors related to a specific individual's experience at a job that influence job satisfaction are person-organization fit, emotional exhaustion and stress (Mak and Sockel, 2001; Carayon et al., 2006; Coldwell et al., 2008; Holtom et al., 2008). Furthermore, factors that show how well an individual fits with an organization (e.g., organizational commitment, identification or compliance) are shown to be important in the retention of employees (Furtmueller et al., 2010a). However, the relationship between demographics of employees (e.g., age, gender and level of education) and employee retention has not been investigated fully (Kyndt et al., 2009).

## **Ease of movement**

Ease of movement is a concept concerned with the employee's decision to stay or leave an organization based on how easy it is to leave the organization (Tanova and Holtom, 2008). In general, the literature on ease of movement studies internal factors and internal mobility, but also external factors such as perceived job market and unemployment levels (Niederman et al., 2007; Holtom et al., 2008; Tanova and Holtom, 2008; Steel and Lounsbury, 2009).

Literature suggests that if IT professionals perceive a wider range of external job opportunities, they will be more prone to leave the organization to pursue those opportunities (Joseph et al., 2007). The perception of external factors is influenced by information gathered externally from, for example, newspapers, head-hunters and other communication channels (Moore and Burke, 2002). Conversely, if IT professionals perceive few external job opportunities, for example because of high unemployment and instable economies, they are more likely to stay with an organization. Financial crisis results in downsizing and, consequently, higher unemployment and higher job insecurity. Organizations may even cut salaries or refrain from increasing salaries in order to avoid solvency problems. Despite this, even in 2010 research indicated that IT professionals noticed that the organizational demand for their skills had increased (Laumer et al., 2011). The job market is still positive for IT professionals (Ghapanchi and Aurum, 2011), due to the important role IT holds in organizations (Niederman et al., 2007). The demand for IT professionals is high, and ease of movement is high (Ghapanchi and Aurum, 2011). While there has been a decrease in applicants for IT-related fields of study, the demand for IT professionals is assumed to even increase in the near future (Khazanachi and Owens, 2011). This implies that the ease for IT professionals to change jobs is currently high, and likely to stay high in the future, which challenges organizations in need of IT staff to develop effective retention strategies

## **Specific aspects of international organizations**

For international organizations, the orientation of the headquarters towards subsidiaries (either ethnocentric, polycentric, regiocentric or geocentric) affects the retention of subsidiaries' employees (Reiche, 2007). The differences between the orientations with respect to personnel management and career development possibilities in international context are as follows. An ethnocentric orientation will focus on developing people from the home country for key positions around the world (Hill, 2009), thereby increasing possibilities for home country employees, while limiting possibilities for local employees.

A polycentric orientation will develop people from the local nationality for key positions in their own country. This will enable local employees to grow into local key positions. Their careers however, will not be able to advance beyond the local key positions. A regiocentric orientation allows regional people to take key positions anywhere in the region. Compared to the previously mentioned orientations, regiocentric orientation enables local employees to advance even further upwards in the organization. Lastly, a geocentric orientation allows people from around the world to advance into key positions around the world (Luthans and Doh, 2009). This orientation gives local employees more opportunities to advance further (upwards) within the organization. This shows that the orientation of the headquarters can limit the career of local employees. If there are more possibilities for growth, employees are more likely to stay (Reiche, 2007). This is

a good example of how career opportunities in the organization affect the retention of employees in international organizations.

### **Unique characteristics of IT professionals**

Previous research shows that IT professionals have distinct characteristics. For instance, they have a strong need for achievement through personal and career development and they want challenging and stimulating work. Across different IT job types, there seem to be differences as well: programmers tend to have lower social needs while IT managers showed a higher need for social interaction (Enns et al., 2006; Coombs, 2009). These results suggest that the specific characteristics of IT professionals may warrant separate research into the unique characteristics of IT professionals and the impact of these characteristics on their retention.

### **Costs and benefits of IT turnover**

Research on the retention of IT professionals has indicated that the turnover among IT professionals is significantly higher than for other workers (Allen et al., 2009; Coombs, 2009; Ghapanchi and Aurum, 2011). There are high costs associated with turnover of IT professionals, include direct costs (e.g., recruitment of new employees) (Holtom et al., 2008) and indirect costs (e.g., disruption of organizational processes decreasing organizational performance) (Felps et al., 2009). Furthermore, turnover of experienced employees and the tacit knowledge that is lost are other aspects of the costs of turnover (Moore and Burke, 2002). Due to these high costs, IT professionals are viewed as an important asset instead of a replaceable commodity (Ghapanchi and Aurum, 2011).

However, there are also positives to the turnover of IT professionals. New employees may bring new knowledge, ideas and experiences into an organization. The departure of colleagues may even provide greater career opportunities for those IT experts who stay and may offer an incentive. Overall, turnover of IT professionals costs organizations more money than the benefits (Ghapanchi and Aurum, 2011).

## **1.2 Theories to help explore our research question**

In this section we will discuss talent management theory, self-determination theory and human capital theory. We have identified these theories as they may help us explore our research question and may help us to further understand retention of IT professionals.

### **Talent management**

Talent management theory not only argues about the importance of keeping talented employees, but also provides a framework in how to attract, retain and develop talent. By drawing on this literature, we aim to derive new insights to enrich the dialogue on retaining IT professionals. Only by understanding the unique characteristics of highly effective IT professionals, can we further explore how to retain these IT professionals.

Talent management is a process to attract and integrate new talent and develop and retain current talent (Joshi and Agarwal, 2011). The talent management process is defined as follows. The first step is selecting and aligning talent (identification of talent); followed by training and development of talent; retaining the talented employees; and lastly, promotions and transitioning

(evaluating and identifying the talents and rewarding them appropriately) (Groves, 2011; Joshi and Agarwal, 2011).

Talent management is important to create a sustainable competitive advantage, increase overall organizational performance and to create long-term organizational success (McDonnell, 2011) and organizational performance (Joshi and Agarwal, 2011). Due to the strategic importance of talent and the short supply of these employees, with the desired characteristics and profile, the 'war for talent' has become more and more fierce (McDonnell, 2011). Given the recent development in the IT job market (with no signs indicating near-future improvement in the discrepancy between the supply and demand of IT professionals) this noted increase in the intensity of the 'war for talent' is especially true for the IT field (Owens and Khazanchi, 2011). While in the past organizational success and organizational image may have been sufficient to attract and retain employees, currently even high performing and attractive organizations must cope with recruiting and retention issues. It is important to align talent with an organization's needs (and good alignment and communication with the employee are needed for this), and it is important that there is a fit between the values of the talented employee and the organization in order to retain the talent (i.e., good recruitment and selection processes are needed to recruit fitting employees) (Furtmueller et al., 2009; Joshi and Agarwal, 2011). However, some scholars suggest that the organizational strategy should be put first and that the development of talent (talent management) should contribute to achieving the organizational strategic goals (McDonnell, 2011).

### **Self-determination theory**

To understand employees' individual needs, Ryan and Deci (2000) have introduced the 'self-determination theory' (SDT). We find this theory useful to elaborate on the needs of IT professionals. SDT proposes that there are three basic needs (i.e., autonomy, competence and relatedness), which should be satisfied in order to increase intrinsic motivation, individual well-being, performance and retention (Ryan and Deci, 2000; Milyavskaya and Koestner, 2011). The first basic need, autonomy, is the need to feel that one's behavior is self-determined and not influenced by outside forces. Second, competence is the need to be able to effectively complete various tasks. The third basic need is relatedness, the need for meaningful relationships with other people (Arshadi, 2010; Johnston and Finney, 2010; Milyavskaya and Koestner, 2011).

SDT describes six different types of motivation scaled on perceived locus of causality, i.e., whether the motivation is considered self-determined or non-self-determined and whether there is a perceived internal or external locus of causality or whether that locus falls somewhere in between (Ryan and Deci, 2000; De Groot and Steg, 2010). While motivation and perceived locus of causality are internal and individual factors influencing the basic needs satisfaction, the interpersonal context also influences the basic needs satisfaction of an individual. The language used during interpersonal communication defines the type of interpersonal context. This can be either autonomy supportive (i.e., using non-pressure language, acknowledging the feelings of the individual in the situation and using rationale when asking someone to participate in an activity) or controlling (i.e., using pressure language in interpersonal communication to pressure someone to behave in a certain way). Research has shown that using autonomy support increases the basic needs satisfaction and increases work motivation and job performance (Arshadi, 2010). This suggests that organizations should try to use HR practices that will help satisfy individual needs

in order to increase motivation and productivity and should focus on autonomy supportive HR practices and leadership styles

Research on the universality of SDT has indicated that SDT is applicable across cultures and domains (Milyavskaya and Koestner, 2011). This implies that SDT will also be applicable for IT professionals. Several studies have shown that need satisfaction has a positive influence on retention of individuals. For example, autonomy support management practices have shown to increase retention (Arshadi, 2010) and providing more challenging work increases retention as well (by fulfilling the competence need) (Preenen et al., 2011).

### **Human capital theory**

Human capital theory, drawn from a resource-based view, describes how investments in human capital (i.e., education and experience (Unger et al., 2011)) influence organizational performance and success (Crook et al., 2011; Ployhart et al., 2011) and organizational value (Doong et al., 2011). The outcomes of human capital investment are defined as knowledge, skills and abilities of employees (Unger et al., 2011). In human capital theory there is also differentiation between generic and organization-specific human capital. While generic human capital is transferable between organizations, organizational-specific human capital is more difficult to transfer between organizations. Therefore, human capital theorists note that only organizational-specific human capital can create sustained competitive advantage for organizations (Crook et al., 2011; Ployhart et al., 2011). Organizational-specific human capital helps employees to make decisions that are in line with organizational strategy, organizational context and competitive environment (Crook et al., 2011). Research has shown that organizational-specific human capital has more influence on organizational performance than generic human capital. However, generic human capital is needed to develop sufficient organizational-specific organizational human capital, making both types of human capital important for organizations (Ployhart et al., 2011). In the end, it remains important for organizations, in order to benefit from their human capital investments, not only to attract, invest and develop human capital, but also to retain human capital (Crook et al., 2011). Likely organizational-specific human capital (similar to what research has taught us about organizational-specific training) will have a positive effect on retention and general human capital (similar to general training) increases the job value of an individual and therefore may have a negative effect on retention.

### **Multiple-constituency approach**

The multiple-constituency approach has been used in organizational performance research as an alternative to goal setting and systems approaches. It is based on the premise that how well an organization is performing depends on who you are asking.

This means every actor (i.e., constituent) has own evaluation criteria and does not always share the same perspective in the evaluation process (Connolly et al., 1980; Jun and Shiau, 2011). Similarly, multiple-constituency approach research on the perceived effectiveness of human resource departments have shown that different actors assess the performance of the human resource department and the effectiveness of HR practices differently. Executives (i.e., top management) gave higher ratings to the performance of the HR department than human resource managers and all other employees (Tsui, 1990). These findings show that the perceptions of different actors can be different, which might have influence on both organizational factors and

job characteristics. Usually top management and HR management define what HR practices are implemented in the organization.

The choice of HR practices has a profound influence on retention factors such as, organizational factors, job characteristics and financial compensation structures. As multiple-constituency approach proposes that different constituencies have different perspectives, this may mean that the HR practices implemented by top management and HR management do not actually benefit the retention of IT professionals. In fact research has indicated that supervisors have a different perspective on what factors are important in retaining employees compared to the employees themselves. HR practices might be implemented that influences retention factors in a way that does not fit the IT professional. For example, top management and HR management might implement a financial compensation system by amount of code written by the IT professional, as they may perceive the amount of code as an important indicator of productivity and progress in IT projects. This may not be appreciated by the IT professional, who may argue that it is not the amount of code written that is important, but also the quality of the code which should count as well. He/she may argue that tackling difficult coding problems is insufficiently rewarded in this system and may find himself/herself underappreciated in this rewarding system. This dissatisfaction could lead to turnover. Likewise, top management and HR management might want to implement a more competitive environment to stimulate individual and organizational performance. This organizational climate of competing with each other may not be appreciated by some IT professionals who may not feel comfortable in such a competitive climate. These individuals may choose to find another organization that fits better with the individual and has a less competitive climate to work for. Multiple-constituency approach could be useful to further our understanding of how the evaluation processes and HR decision making processes work in specific organizations by breaking it down into all of these different perspectives. This process could, theoretically, help us to improve retention in these specific organizations.

What all of these IT-specific findings in the literature demonstrate is that the importance of information technology in organizations has increased and interest has been growing in topics related to the turnover and retention of IT professionals. However, literature on retention has mainly focused on quantitative and conceptual research. There has been little qualitative research conducted on the topic of retaining IT professionals. Therefore, to fill this gap in the research, this thesis is centered on a qualitative study to investigate this topic. Moreover, literature indicates that IT professionals should be considered separately in the retention question. Indeed, the literature suggests that there the unique characteristics of IT professionals need to be considered in employee retention. The theories from other fields are likely useful in further exploring our research question and may contribute to our understanding of retention of IT professionals.

## **2. RESEARCH STRATEGY**

We carried out in-depth interviews with young IT professionals. The purpose of the interviews was to study the young professionals' perceptions of retention factors in the current economic climate. The insights gained from the interviews were compared to the salient concepts in the literature.

In the first stage of research, we conducted a systematic literature search across various research disciplines studying employee retention and developed a grounded analysis of factors relevant for employee retention. Then, we carried out a qualitative study using interviews with 21 young IT professionals. In the following section both procedures are elaborated on, starting with the literature selection process, analysis and data description. Then, we describe the interview data collection and analysis.

### **2.1 Literature data collection**

In our literature search, peer-reviewed journal articles and relevant papers from the ACM Computer Personnel Research, which are written by recognized authors in the field, were examined. Only articles published in the last 10 years were included in order to limit the study to the review state-of-the-art research on employee retention.

After determining the most relevant fields of research where articles on employee retention are published (Psychology, Organizational Behavior, Human Resource Management, Management and Information Systems), we selected Scopus and Web of Science databases to find relevant articles. Synonym keyword search was used for identify possibly relevant articles. The following exact search terms were used: retention, retention employee, retention work\*, retention workforce, retain employee retention factors, organization\* retention, motivat\* software engine\*, motivat\* professional, motivat\* information technology professional, motivat\* work\*, motivat\* workforce and motivat\* information technology work\*.

The next step involved the actual search for articles. First, doubles were filtered out from the search results, followed by multiple steps of refining the sample based on title and abstract. We looked for literature that is contained research on retention or turnover and other relevant literature on IT professionals. After forming the initial selection of articles, the list was discussed with a colleague specialized in human resources and a final list of articles was derived for the literature analysis.

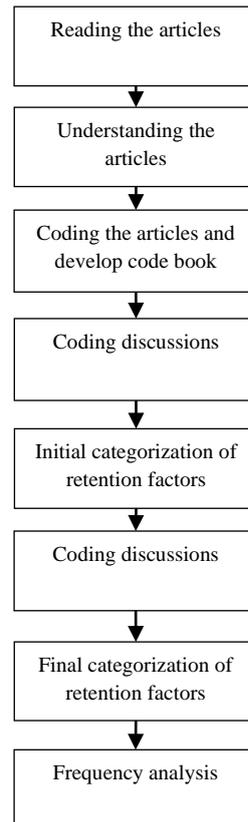
### **2.2 Literature analysis**

The analysis of the literature began with intense reading and understanding of the articles. A codebook was created documenting relevant findings identified in the literature. Using open coding, categories were made and refined (for an example on deriving thematic categories from literature data, see Wolfswinkel et al., 2011). This resulted in an initial coding scheme. Two researchers engaged in code discussions to resolve different points of view about labeling retention factors. This iterative process resulted in changes and refinement of the coding scheme. An important factor in this step was to make sure that the retention factors were externally heterogeneous (i.e., to make sure there was no thematic overlap between the factors). The factors also had to be internally homogeneous (i.e., the sub-factors of retention factors needed to be similar). Factors that were only discussed in one or two articles were omitted from the coding

schema as there was not enough empirical support for these factors. This iterative coding process resulted in an overview of relevant retention factors for IT professionals synthesized from empirical findings.

The categorization was discussed during the coding process with two colleagues specialized in human resources management and information systems. These ongoing coding discussions required much effort and time and resulted in changes and additions to the categorization of retention factors and a revised categorization of retention factors. Figure 1 is a graphical representation of this process.

Figure 1. Literature analysis process



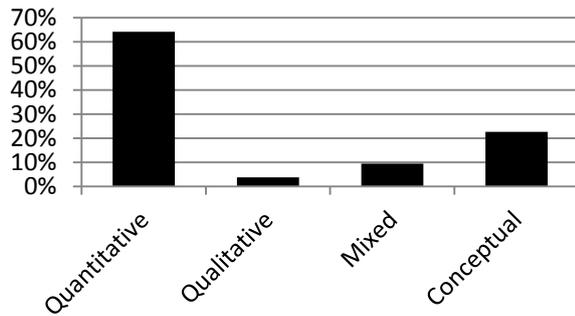
### 2.3 Literature sample description

When looking at the journal distribution of the articles, most of the articles were published in the *Communications of the ACM* (n=8), followed by *Information & Management* (n=6) and *The International Journal of Human Resource Management* (n=5). See Appendix I for a complete overview of the journals where articles on IT professional retention are published. As was to be expected from the scope of the research, most articles came from either Human Resource Management or Information Technology related journals. More than 90% of the selected articles were published in journals with an impact factor over 0.8.

The scope of the literature analysis covered the past 10 years. Analysis of the distribution of number of articles per year shows that there is a clear predominance of more recent literature in the selection (52% of the articles were from 2007 or newer). **Error! Reference source not found.** gives an overview of the number of articles per year.

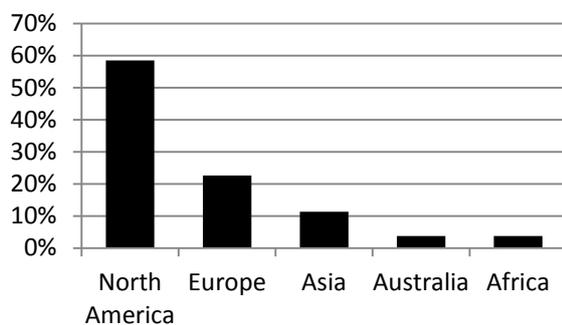
When reviewing the methods used in the reviewed literature, it is apparent that most of the articles are quantitative (n=34) or conceptual (n=12), with only few mixed method articles (n=5) and very few qualitative articles (n=2). This shows the dominance of articles based on quantitative methods and a clear under-representation of articles based on qualitative methods (see Figure 2).

Figure 2. Percentage of methods used by papers



The distribution per continent gives an indication of the geographical focus of the research. Most of the articles were written by authors affiliated with North American universities (58%), followed by European (23%), Asian (11%) and finally African and Australian universities (4% each). Of the North American university affiliated authors, most of them were working in the United States at the time of publishing (94%) and in Canada (6%). When looking at the literature from Europe, most of the articles came from authors working in Belgium (25%) and the United Kingdom (25%). The retention literature from authors affiliated with Asian universities was mostly focused on international business (i.e., how to retain local professionals and managers from a multinational cooperation perspective). More specifically, one article focused on retaining the top managers in China using an international joint-venture perspective. Figure 3 shows the distribution of the university affiliation of the authors per continent.

Figure 3. Percentage of papers per continent



## **2.4 Interview data collection**

The aim of the interviews data was to identify and categorize the relevant retention factors that motivate young IT professionals to stay with an organization.

The qualitative data was collected by a Master student who conducted interviews with young IT professionals who were at the end of their studies and were planning on entering the job market. A semi-structured interview scheme was used to interview 21 respondents and was initially pilot-tested with four young IT professionals.

A convenience sampling strategy was used (Babbie, 2004). Young IT professionals were approached at a university in the Netherlands. The sample size was enlarged further by using snowball sampling (i.e., by asking participants if they knew other possible candidates for interviewing). The sample was comprised of students graduating from various IT-related Master programs and post-graduate students in the process of earning Ph.D.'s. All of the students studied at the same university in the province of Overijssel near the German border, in the east of the Netherlands. In total, 58 young IT professionals were invited to take part in the study, of which 25 agreed to participate in interviews. This indicates a response rate 43.1%. Four cancelled the interview on short notice and the remaining twenty-one young IT professionals were interviewed (n=21).

Emails were sent to the interviewees before the actual interview, explaining the purpose of the study along with the interview questions. Each interviewee was then contacted to arrange individual appointments for the interviews. Each of the interviews lasted between 60 and 90 minutes. At the start of each interview the purpose of the study was described and confidentiality was assured.

Questions focused primarily on exploring young professionals' perception of what makes them stay productively working in an organization over a long period of time. Interviewees were asked to fully explain their perceptions, opinions, feelings and thoughts and provide examples.

## **2.5 Interview analysis**

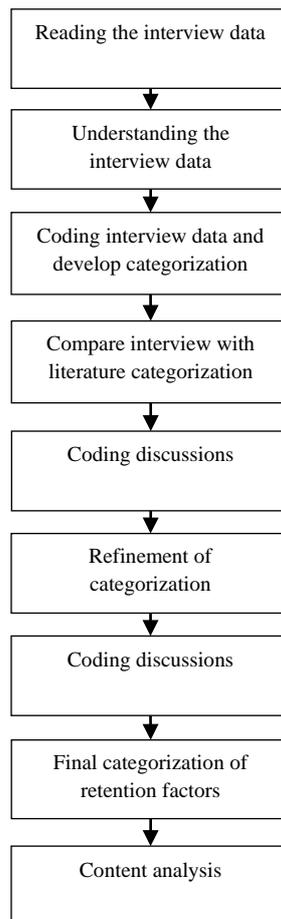
After the same interviewer transcribed the interview data, the transcripts were sent back to the interviewee within a week after the interview for member checking. This enhanced the validity of the data (the accuracy and credibility of the collected interview data) (Creswell, 2009).

The analysis process was done by two different researchers and first involved reading and understanding the data, followed by the coding of the interview data. By intensely reading of the interview data, insights relating to both the content of the research and the means to analyze the interview data were obtained. There are two important purposes for coding: "convergence and divergence" of the interview data. Coding enables researchers group similar themes together and categorize themes that are dissimilar (Miles and Huberman, 1994). During data analysis a constant comparative and iterative method was used to add rigor to the coding process (Creswell, 2009). The method of returning to the data again and again ensures that each interpretation is supported in the transcripts. Furthermore, by constantly discussing the categories with a colleague who specializes in human resources, extra rigor was added in the analysis process.

Following Patton's (2002) advice, interview quotes have been added wherever applicable to provide readers with a view of the interview verbatim.

Coding of the interview data started with categorizing emergent themes, creating a preliminary categorization. After the preliminary categorizing was developed, the categorized interview data was compared with the categories from the literature and discussed with a colleague specialized in human resources management. This led to refinement of the categorization of retention factors. Following another round of coding discussions the final categorization of retention factors was created. The last part of the interview data analysis was a content analysis. Counting the frequency of support for the categories enables us to gain insight in the relative importance of the different retention factors. Figure 4 is a graphical representation of this process.

*Figure 4. The interview data analysis procedure*



### **Examples of category development**

To give an insight into the data analysis process, examples are included here on how the different retention factors were formed and refined (see Wolfswinkel et al., 2010). To begin with refinements were done on the retention sub-factor social elements. Both literature and interview data suggested that social elements (e.g., working in teams) are important in the retention of IT professionals. The interview data showed social elements to be among the most important factors in retaining IT professionals. This led to the separation of social elements from work environment. With this change, the social elements category contained the social aspects of the

work environment, while other aspects of the work environment remained under the retention sub-factor work environment (e.g., the resources the IT professional has when doing his work).

The literature provides many different characteristics of organizational factors that are important in the retention of IT professionals. Since these characteristics are often overlapping, the factors that overlap have been bundled together. Furthermore, organizational climate and organizational culture are sometimes (wrongfully) interchanged or no distinction is made at all between both (Ashkanasy et al., 2011). To avoid this, we have combined organizational climate and culture together. Further research would therefore be required to tug apart the individual significance of each of these categories of factors.

When looking at career advancements, we separated internal mobility (lateral movement) from promotions (upwards mobility). The main reason for this distinction was as follows. Internal mobility can support the retention of employees by providing a new environment (e.g., a new department) with new challenges, while promotions tend to satisfy the growth needs of the employee but do not always provide the specific challenge of a new work environment. In this light the two retention sub-factors serve two very distinct purposes, but both can increase retention of employees in organizations.

We also made some refinements to the retention factors financial compensation, recognition and benefits. To prevent overlap between these factors, the financial aspects of recognition and benefits were included under financial compensation.

Additionally, our initial separation of intrinsic and extrinsic financial compensation was dropped. The reason for this was there was not enough support from the interview data to keep intrinsic compensation as a retention sub-factor. Moreover, in the literature the distinction between intrinsic and extrinsic compensation was not always made. This prompted us to reconfigure financial compensation to contain both intrinsic and extrinsic financial rewards.

The retention factor personal development was refined as follows. Since the aspects of learning and training were often mentioned together in the literature, we grouped learning and training together. This left us, at first, with three retention sub-factors, learning and training, mentoring and feedback (i.e., receiving feedback with the purpose of learning and personal development). After reading the interview data, followed by discussions, it became apparent that there was little support for leaving mentoring and feedback as separate retention sub-factors. This was due to the little support found in the empirical data and the weak support in the literature for the individual retention sub-factors. Moreover, the main goal of both mentoring and feedback was, in the end, to provide an opportunity of for the IT professional to learn. Therefore, these retention sub-factors were grouped with the retention sub-factor learning and development.

For the retention factors recognition and benefits, we made the distinction that these factors should only contain the non-financial aspects. This was done to keep the factors externally heterogeneous; financial recognition and financial benefits fall under financial compensation.

We also grouped organizational stability with job stability. This had two reasons, first because instability in the organization usually leads to job instability. For example, when an organization is struggling to keep itself operating, employees will feel insecure about their jobs. Second, there was little support from the literature and interview data to keep organizational stability as a separate retention sub-factor.

Though we had initially planned to include ease of movement as a retention factor, when analyzing it again in the categorization process, it was decided that based on the collected data from the interviews and literature that ease of movement could not be considered a separate retention factor. At first we had excluded internal factors from ease of movement, as these internal factors all fell into other retention factor categories (e.g., job satisfaction and internal mobility). Therefore, our definition of ease of movement referred to external factors only, such as perceived job market and unemployment levels, which influence retention. However, since the job market is still quite positive for IT professionals (Ghapanchi and Aurum, 2011), and with the important role IT has in organizations (Niederman et al., 2007) the demand for IT professionals has stayed high. Therefore, the current job market side of ease of movement is high for IT professionals (Ghapanchi and Aurum, 2011). In respect to the probable future developments of the IT job market, there are two trends to consider. First, the current inflow of new students into IT-related fields of study is low, which suggests that future supply of IT professionals will stay low. Second, the upcoming aging of the working population (baby boomers) suggests that future demand for IT professionals will stay high (Khazanchi and Owens, 2011). Combining these two trends suggests that there will be no improvement in the demand and supply discrepancy of IT professionals. Therefore, we propose that ease of movement of IT professionals will stay high. This would imply that currently (and with no signs of change in the near future) ease of movement is not a retention factor for IT professionals. For this reason ease of movement was omitted from the categorization of retention factors. So while ease of movement is relevant in retention of employees from other fields, because of the job market in the IT field, it is not relevant in the retention of IT professionals.

The last factor, individual characteristics, consists of characteristics of the individual IT professional (i.e., personal growth orientation, relationship orientation and career stage). Our data suggested that these individual characteristics moderate other retention factors. We also included organizational commitment to individual characteristics. Organizational commitment is the affective attitude the employee has towards the organization, a characteristic of the individual employee.

The retention sub-factor personal growth orientation was refined during the data analysis process. While at first we separated personal growth orientation and personal performance, we merged these two retention sub-factors into one. The reason behind this merge was that high performers usually show 'high' personal growth needs, desiring career advancement or personal development (D'amato and Herzfeldt, 2008). This suggests that these two individual characteristics are related to each other and can be combined.

The development of the retention sub-factor fit with job and organization was as follows. The literature review indicated that a good (perceived) fit between the individual and the job and organization is important. While at first we added expectations to this retention sub-factor, we later decided to remove it. The expectations the individual has of the job and organization should fit with what the individual is actually experiencing as an employee. While it is possible that these good expectations in-and-of themselves have positive effects on the retention of the employees, it is actually the perceived fit that is most important here. Furthermore, most literature note that expectations of the job (if the job is long-term or short-term commitment) influences organizational commitment (Hausknecht et al., 2009) and not retention directly. Therefore, we entirely dropped expectations as a retention sub-factor.

Lastly, the distinction between job satisfaction and the retention sub-factor fit with job and organization was made as follows. Job satisfaction is concerned with the satisfaction an individual gains from doing his/her job. This can be the satisfaction an IT professional gets from doing a good job, being able to solve difficult problems or working in a good functioning team. But it may also entail doing work that has a broader social relevance, which could give some employees extra pride and satisfaction in doing his/her job. The fit of the job (which is included into fit with job and organization) is exclusively concerned with the fit the job has with the individual. Furthermore, a good fit between the individual and the job may lead to better job satisfaction.

### **Content analysis**

We used summative content analysis to gain insight into which of the retention factors were supported the most in the interview data. A summative content analysis is a quantitative approach towards content analysis that involves counting and comparing content (usually keywords) and interpreting the findings afterwards (Hsieh and Shannon, 2005).

In our research the frequency of the retention factors mentioned in the interview data was counted using our retention factor categorization scheme. Each interviewee showing support for one category counted as one point for that particular category. The retention factors that had the highest frequency were interpreted as being more important retention factors because they had the most support relative to the other retention factors identified in our research.

After counting how often a factor was mentioned, we created a combined ranking. This ranking combined the findings from the literature with the findings from the interviews. We first calculated the relative importance in percentages of the total authors or interviewees. By adding the two percentages together we created the combined ranking (a similar ranking approach was used by Furtmueller et al., 2011). The reason we used the percentages and not the frequencies for the combined ranking was to compensate for the sample size difference between the literature and the interviewees. Since there are more authors than interviews, support from, for example, ten authors counts less than support from ten interviewees. This information would be lost by simply adding the frequencies from the support by author with that of the interviewees.

The scoring for certain individual characteristics (personal growth orientation and relationship orientation) was based on the interviewees mentioning certain topics that were seen as indicators for the specific characteristic. For example, career- and personal development-oriented individuals are considered to have 'high' personal growth orientation. Therefore, young IT professionals who indicated career advancement or learning new skills as important for them to stay in an organization scored one point for personal growth orientation, with a maximum of one point per interviewee.

Likewise, individuals that mentioned social elements as important for them to stay in an organization show 'high' relationship orientation. For these individuals, relationships with colleagues are important. Therefore, young IT professionals that mentioned social elements as being important for them to stay in an organization scored one point for relationship orientation.

### 3. RESULTS

The final categorization of the identified factors are found in Appendix II; this includes an overview of the support for each factor found in the literature and empirical support for each of the retention factors from the interview data. An overview of example quotes from the literature and interview data regarding the retention factors can be found in Appendix III. The support found in the literature for each retention factor is calculated by counting the number of unique authors mentioning the retention factor. If an author mentions multiple retention sub-factors of the same retention factor, this author counts only once for the support of that retention factor.

The most frequently mentioned retention factor identified by the interview data was organizational factors, with the retention sub-factor work environment (n=16); followed by career advancement, with the retention sub-factor promotions (n=15); and financial compensation (n=12). When the interviewees talked about the work environment, they often referred to this in the context of social elements with other colleagues. This is reflected in the retention sub-factor social elements (n=10). In this context they also referred to the individual characteristic ‘relationship orientation’ (n=10). The retention sub-factor personal growth orientation has scored high as well (n=16); every young IT professional that talked about either career advancement or personal development mentioned something that was counted in this individual characteristic. Some young IT professionals (n=7) noted that the importance of retention factors would change over time and this shows that some young IT professionals are aware of the importance of various career stages. Lastly, the perceived fit between the culture and organization with the individual has also been mentioned frequently (n=13).

The interview data suggests that the social environment --- having colleagues and managers that fit with the young IT professionals --- is one of the most mentioned and probably one of the more important factors in retaining the young IT professionals. Other retention factors that seem especially important for the young IT professionals are the opportunity to advance in their career, autonomy and flexibility in their job, and financial compensation.

When looking at the combined ranking, the table below shows the top five retention factors that were mentioned most often in our research:

*Table 1: Top 5 combined ranking of mentioning of retention factors*

Rank	Retention factor	Frequency of mentioning of retention factor			Most frequently mentioned retention sub-factor
		Combined ranking	Literature (%)	Interviewees (%)	
1.	Organizational factors	161	70%	91%	Work environment
2.	Job characteristics	120	68%	52%	Job content
3.	Career advancement	107	35%	71%	Promotions
4.	Financial compensation	100	43%	57%	Financial compensation
5.	Personal development	69	40%	29%	Learning and training

Some of the individual characteristics we identified in the literature were not mentioned by the interviewees. These include organizational commitment and individual characteristics. All of the other retention factors were mentioned by the young IT professionals in the sample. This shows that the literature generally supports the retention factors identified in the interview data. In the next section, each of the retention factors will be discussed in detail.

### **3.1 Organizational factors**

The most frequently mentioned retention factor (in both literature and interviews) is organizational factors. This retention factor contains the retention sub-factors characteristics of the organization and the work environment. Literature shows that these sub-factors have influence on the retention of employees (Beecham et al., 2008; Hall et al., 2009). We have identified six retention sub-factors of organizational factors, namely (in ranking of combined ranking) work environment, social elements, organizational climate and culture, organizational image, organizational fairness and balance of work/family life. These retention sub-factors are discussed in detail in the next paragraphs.

#### **Work environment**

The most mentioned sub-factor of organizational factors revolves around the work environment, which is often noted as an important factor in retaining employees (Beecham et al., 2008; Hall et al., 2009; Blomme et al., 2010; Ghapanchi and Aurum, 2011). Work environment includes the resources that are available to the employees when doing their work (Moore, 2000). Social elements (i.e., the social aspects of working in the organization) in the organization are sometimes mentioned in both the literature and by interviewees as part of the work environment. In our research we have separated social elements from the sub-factor work environment, as both the interviews and literature indicate that work environment is an important sub-factor on its own.

#### **Social elements**

Social elements include items such as working as a team, and the relationships with colleagues and management, and these are also significant retention factors (Griffeth et al., 2000; Longenecker and Scazzero, 2003; Lee, 2004; Reiche, 2008). The influence of social elements on retention is moderated by the relationship orientation of the employee. For instance if an employee is more introverted, social elements will have less effect on retention than for extroverted employees who desire more social affiliation (Lee, 2004).

#### **Organizational climate and culture**

The characteristics of the organization are important in the retention of employees. Examples of organizational characteristics that have been shown to influence retention are, among others, the organizational climate and culture (Rumpel and Medcof, 2006; Beecham et al., 2008; Holtom et al., 2008; Samuel and Chipunza, 2009), identification with the organization (Paré et al., 2001; Reiche, 2008; Coombs, 2009), the values and beliefs of the organization (Manion, 2004) and organizational culture (Longenecker and Scazzero, 2003; Carayon et al., 2006; Reiche, 2007; Mcknight et al., 2009; Ghapanchi and Aurum, 2011). As many of these characteristics overlap, these have been bundled under organizational climate and culture.

With regard to organizational climate and culture, it is essential that the employee feels that there is a match between himself/herself and the organization. When this match is perceived, it becomes a strong retention factor. As employees gain new work and life experiences, individual work attitudes and aspirations change, and consequently the match with the organizational climate and culture may also change with the new attitudes (Agarwal and Ferratt, 2000). This suggests that career stage moderates the relationship between organizational climate and culture and perceived fit of the individual with the organization.

## Organizational image

Organizational image has also been found to influence retention (Agarwal and Ferratt, 2002; Rumpel and Medcof, 2006; Chasserio and Legault, 2009; Coombs, 2009). Hausknecht et al (2009) suggest that different individual characteristics moderate the influence of the organizational image; specifically, organizational prestige was more likely to be mentioned as a reason to stay by high performers than by low performers. Similarly, Coombs (2009) notes that the media attention and image that people have of an organization influences retention. It seems that the more positive news there is about the organization, the more positive feelings employees have for the organization, making them more prone to stay with the organization.

The organizational image is also important for retaining IT professionals. The image of the organization is especially important for high performers with 'high' personal growth orientation. These IT professionals want a prestigious organization that is successful and shows growth potential, which will benefit their personal and career development (Agarwal and Ferratt, 2002).

Here are two quotes to illustrate the importance of the image of the organization:

*“[the growth of the company] not only financial, also like the other they expand to more areas or ... I mean the business side... they have more business, more diversity in the business.”*

*“If the company is doing quite well or doing a lot of good things, then I would stay, however if I sense that the company is just not really successful then I would not want to stay.*

## Organizational fairness

Organizational fairness refers to equal treatment in the organization. This can be related to fair distribution of compensation (so-called distributive justice) (Paré et al., 2001; Reiche, 2008; Coombs, 2009; Hall et al., 2009; Hausknecht et al., 2009), but it should also be related to the procedure that leads to this distribution, which should be fair (procedural justice) (Paré et al., 2001; Reiche, 2008). Lastly, the way that the organizational policies are applied and carried out, also needs to be fair (interactional justice) (Moore and Love, 2005). Furthermore, seniority-based compensation can be a good way to retain older, more experienced employees and motivate newer employees to stay longer with the organization in order to receive higher compensation later on in their careers (Cardy et al., 2007; Reiche, 2008).

Fair treatment seems to be important to IT professionals. Not just the fact that compensation should be fairly distributed and proportional to the work done by the individuals (Griffeth et al., 2000; Josefek Jr and Kauffman, 2003; Hausknecht et al., 2009; Mcknight et al., 2009; Ghapanchi and Aurum, 2011), but also the procedure that leads to this distribution should be fair as well (Griffeth et al., 2000; Paré et al., 2001; Thatcher et al., 2002; Moore and Love, 2005; Joseph et al., 2007; Reiche, 2008). The literature shows support for the importance of organizational fairness to IT professionals in terms of retention.

The following quote from the interview data supports the importance of organizational fairness for the young IT professionals.

*“if everything is done honestly. For example, a colleague of mine is performing worse than myself, but gets a promotion and I do not. That sort of thing. So, perceived fairness”*

## **Balance of work/family life**

A good balance between work and family life is also mentioned in the literature as positive aspect. Some authors note that providing a good balance between work and family life increases retention of employees (Cardy et al., 2007; Joseph et al., 2007; Hall et al., 2009; Blomme et al., 2010). Quite possibly, a good balance between work and family life will become more important to employees later in their career stage, when they are married and have children (Moore and Burke, 2002). Therefore, career stage might moderate the strength of work and family balance as retention factor.

The literature suggests that female IT professionals regard having a good balance between work and family as an more important retention factor than do men (Armstrong et al., 2007; Blomme et al., 2010). This suggests that gender moderates the importance of balance of work/family life in retaining employees. Therefore, we propose that gender moderates the effects of the balance of work/family life as a retention factor for IT professionals.

The interview data also shows the importance of balance between work and family life for the IT professionals.

*“Family work balance must be possible for one thing.”*

*“Family and work should be balanced.”*

## **3.2 Job characteristics**

The second retention factor in the combined ranking is job characteristics. When there is a good fit between the characteristics of the job and the needs of the employee, it is more likely that employees will be retained (Beecham et al., 2008; Reiche, 2008; Mcknight et al., 2009). The retention sub-factors we have identified (in ranking of combined ranking) are job content, autonomy and job satisfaction.

### **Job content**

The content of the job itself is an important retention sub-factor in retaining employees (Griffeth et al., 2000; Carayon et al., 2006; Armstrong et al., 2007; Holtom et al., 2008; Mckinney et al., 2008; Holtbrügge et al., 2010). This includes the work being interesting and/or challenging (Agarwal and Ferratt, 2001; Pawlowski et al., 2005; Mcknight et al., 2009; Samuel and Chipunza, 2009). Job content that fits the employees' needs has been found to have positive influences on employee retention (Agarwal and Ferratt, 2002; Joseph et al., 2007; De Vos and Meganck, 2009; Blomme et al., 2010; Kwon et al., 2010).

The content of the job plays an important factor in retaining IT professionals (Thatcher et al., 2002), and the work itself has been mentioned several times in the IT-specific literature as an important aspect of the job for IT professionals. The job needs to be interesting and challenging for the IT professionals to keep them interested in the job and make them stay with the organization (Longenecker and Scazzero, 2003; Beecham et al., 2008; Hall et al., 2009; Ghapanchi and Aurum, 2011). Interesting and challenging work seems to be especially important for the young IT professionals.

*“The challenge... If I don't have any challenge I will just move! But also it contradicts the comfort zone, sometimes if you're too long in your comfort zone you don't improve yourself.”*

*“...but also job-based because then I'll need new challenges and also experiences new things.”*

This indicates that job content is important for IT professionals and a good match should be found between job content and the IT professional to increase job satisfaction and retention.

### **Job satisfaction**

It is clear that job satisfaction is an important aspect of the larger category of job characteristics and research mentions that job satisfaction increases retention (Hsieh and Liu, 2006; Beecham et al., 2008; Holtom et al., 2008; Tanova and Holtom, 2008). The significance of the task from an organizational viewpoint or even from a societal viewpoint can help increase retention, by creating job satisfaction (Beecham et al., 2008; Mckinney et al., 2008; Hall et al., 2009; Klawe et al., 2009; Mcknight et al., 2009).

Job satisfaction is also important factor for IT professionals (Mak and Sockel, 2001; Lee, 2004; Carayon et al., 2006; Niederman et al., 2007). This may be personal satisfaction, for example by completing a difficult task. For some IT professionals, job satisfaction is more important than personal satisfaction with the job. For these IT professionals it is important that what they do “matters”, not only in organizational context but also in a broader social context (Thatcher et al., 2002; Pawlowski et al., 2005; Coombs, 2009; Klawe et al., 2009; Mcknight et al., 2009; Ghapanchi and Aurum, 2011). Coombs (2009), for example found that in his sample of IT professionals who worked in the health sector, improving patient care was an important reason to stay in the health organization instead of joining an organization whose sole aim was to make a profit. This suggests that for these IT professionals doing socially relevant work is a factor they found important within the job.

The following quote illustrates that for the interviewed young IT professionals, the significance of the contribution is also important.

*“and if it gives me a sense of pride to work there! For example, if you work with the government you help all people and you go home... you think well I've done quite nice things today. Then I think it is a job where I'd stay for a long period of time.”*

### **Autonomy**

Having autonomy in the job is an important aspect of the job. This includes influence in decision making and freedom in the work environment, such as determining work times. Autonomy has shown to reduce job stress and increase retention (Moore and Burke, 2002; Thatcher et al., 2002; Carayon et al., 2006; Joseph et al., 2007).

Autonomy and freedom in the employee's job seems to be important for IT professionals as well. This includes freedom in determining working hours, as well as influence in the decision-making process (Longenecker and Scazzero, 2003; Pawlowski et al., 2005; Ahuja et al., 2007; Coombs, 2009). This also seems important for the young IT professionals that were interviewed; below are some examples to illustrate this.

*“And also the independence a little bit, that you have a set of things that you can decide for yourself in what direction it [the job] will go. It is a little bit about the authority... the things you can do.”*

*“And also flexibility... not only working from the office but also working from home, online...”*

### **3.3 Career advancement**

The third retention factor in the combined ranking is career advancement. We have divided the retention factor career advancement into two separate types of factors. First, there are promotions, which consists of upward mobility (Steel and Lounsbury, 2009). Second, there is internal mobility, this consists of the opportunities for lateral movement into different departments (Blomme et al., 2010). Our results suggest that the influence of career advancement and the related impact on retention is different for IT professionals.

#### **Promotions**

Upward mobility includes career management and promotions (advancement opportunities). The literature suggest that these types of upward mobility may increase retention (Griffeth et al., 2000; Joseph et al., 2007; Reiche, 2008; De Vos and Meganck, 2009).

There are differences between high-performing employees and low performers. High performers are more likely to report remaining in an organization because of career advancement opportunities compared to low performers. Highly effective IT professionals are generally characterized by high performance. If an individual thinks personal growth is important (‘high’ personal growth orientation), career advancement will have a higher impact as a retention factor (Hall et al., 2009; Hausknecht et al., 2009). This suggests that the role of career advancement is moderated by ‘high’ personal growth orientation, an individual characteristic, which positively moderates the effects of career advancement on retention.

In general, IT professionals appear to be concerned about their career development prospects (Agarwal and Ferratt, 2001; Joseph et al., 2007; Beecham et al., 2008; Ghapanchi and Aurum, 2011). This is likely related to the growth orientation of IT professionals. IT professionals want to satisfy their growth needs, which is one of their higher-level needs (Maslow) (Lee, 2000; Rumpel and Medcof, 2006).

The following quotes show support for the importance of career advancement in the retention of the young IT professionals:

*“... I’d really like to manage ... I really need to advance... so if it’s not going fast enough with a company I’d just pack up my things and move.”*

*”If some organization is very attractive to work at, but does not offer any potential for promotions or growth ... maybe other companies can.”*

#### **Internal mobility**

Internal mobility opportunities can be used to retain employees. This includes job change or professional growth within the current organization (Agarwal and Ferratt, 2002; Joseph et al.,

2007; Reiche, 2008; Steel and Lounsbury, 2009; Blomme et al., 2010; Ghapanchi and Aurum, 2011).

Lateral movement is an effective way to bring new challenges into the job and to keep the job interesting for IT professionals. This can help retain IT professionals who generally seek interesting and challenging work (Agarwal and Ferratt, 2002; Joseph et al., 2007; Ghapanchi and Aurum, 2011). The following quotes from the interview data support the notion that IT professionals do not want to do the same type of work over and over again, but want interesting and challenging work.

*“So career opportunities because I do not want to do the same thing over and over again year after year.”*

*“What am I going to do now while you might also want to change. So, flexibility to change assignments/functions.”*

### **3.4 Financial compensation**

The fourth retention factor in the combined ranking is financial compensation. In the literature we found two major types of financial compensation: extrinsic and intrinsic financial compensation. Intrinsic forms of compensation are influenced by an individual's actions, while extrinsic forms of compensation are given by someone else (Daft, 2008). Individuals who perform better than the average often receive more financial compensation than individuals that perform below the average. Since highly effective IT professionals are associated with performing better than average, they are more likely to receive above average financial compensation. An example of intrinsic financial compensation is performance-based pay, where the individual's performance influences the pay of the employee. For an IT professional, this might be the amount of code written by a programmer. In contrast, a base-level payment is an example of an extrinsic reward, where the performance of the individual has no influence on the payment level of the employee.

Regarding retaining employees, Hsieh and Liu (2006) examined one specific form of financial compensation, namely stock ownership. Stock ownership is offering stock to employees as part of their financial compensation and was found to be positively related to retention (Hsieh and Liu, 2006). The influence on retention is, according to Hsieh and Liu (2006), caused by two aspects. First, the perception of ownership by the employee as a stock holder in the company motivates the employee. Second, the financial value of stock ownership might be lost when leaving the organization, thus giving the employee incentive to stay at the organization. However, the influence of financial value as a retention factor is moderated by the portability of the stocks. As the financial loss incurred when leaving the organization decreases, the effect of the financial value of the stocks on retention is decreased as well.

Research on the motivating impact of financial compensation comes to contradictory conclusions. Several studies support the importance of financial compensation in motivating and retaining employees (Agarwal and Ferratt, 2001; Longenecker and Scazzero, 2003; Kwon et al., 2010). Other studies suggest a weak or even non-significant relation between financial compensation and retention of employees. For example Blomme et al. (2010) found only weak correlations between financial compensation and commitment.

These differences might be due to contextual influences such as the sector in which the organization operates. For instance, Samuel and Chipunza (2009) showed in their research that there is a difference between the private and public sector in the importance of intrinsic financial compensation in retaining employees. While employees from private-sector companies were influenced by intrinsic financial compensation and actually preferred intrinsic rewards, employees from public-sector companies showed no influence on retention by intrinsic financial compensation and were less interested in intrinsic compensations. Another possible explanation is that the view of the importance might vary among employees in different levels of the organization. de Vos and Meganck (2009) showed that managers assume that financial compensation is one of the most important factors for employees to leave the organization, while the interviewed employees indicated that financial compensation plays a marginal or even a non-significant role in the decision process whether to leave the organization.

The gathered IT-specific literature also shows contradictory results on the effects of financial compensation as a primary retention factor. Rumpel and Medcof (2006) suggest that in the technology sector the organization's technology workers may already receive decent financial compensation that satisfy their basic needs. That is why Rumpel and Medcof (2006) state that technology workers are looking to satisfy their higher-order needs (Maslow) in their work environment in personal development. Because of the competitive payment in the IT sector (Agarwal and Ferratt, 2001), financial compensation may play a less important role compared to other retention factors. This is also reflected in the literature, where financial compensation is not frequently mentioned in the context of IT retention. Furthermore, research suggests that more financial compensation only increases retention when job satisfaction is low (Kyndt et al., 2009).

In contrast, Moore and Burke (2002) note that the sector-wide focus on using financial compensation to attract IT professionals might encourage turnover. When confronted with similar jobs but different pay, IT professionals will choose the job that offers higher pay. This suggests that pay is still important to IT professionals. This idea proposed by Moore and Burke (2002) is also supported by the interview data:

*“So if another company comes to me and offers me the same things... the same conditions but double the pay... So the decision [to leave] is up to me.”*

For IT professionals, financial compensation may have become a hygiene factor in accordance with Herzberg's two-factor theory (Herzberg et al., 1959). This would suggest that while higher financial compensation does not increase motivation, financial compensation that is too low can act as a demotivation. Whether financial compensation plays a motivational or hygiene role, financial compensation remains important for retaining IT professionals. In this context, the apparently contradictory results between Rumpel and Medcof (2006) and Moore and Burke (2002) might be explained as follows: although financial compensation is important for IT professionals, other factors in the organization have more effect on the retention of these professionals. This is mainly due to the competitive payments in the sector. The financial compensation needs be adequate to provide a market-level standard of comfort and satisfy the financial needs of the IT professional, which can differ for each individual. Moreover, organizational factors and job characteristics are almost never the same, therefore in practice we expect that organizational factors and job characteristics will always be considered and job choice (in practice) will not solely depend on financial compensation.

The interview data also shows that financial compensation is important for the interviewed IT professionals. Here are a few quotes from interviewees to illustrate the importance of financial compensation:

*“A good salary of course”*

*“...salary based because in time I'd have kids and stuff like that,  
then I'd probably need more money”*

The following quote however, shows support for our idea that although financial rewards are important, ultimately other factors (mainly work environment and social elements) are more important in retaining IT professionals.

*“But the working environment is really, really important. No matter how good your salary is, if you don't like the people you work with everyday... [Then] it doesn't matter.”*

In general, financial compensation needs to be sufficient to meet IT professionals' basic financial needs and financial compensation may stimulate motivation and retention. Financial compensation can provide positive feedback to IT professionals and imply that they are doing a good job in the organization and are valued by the organization. However, organizations should try to differentiate themselves by using other retention factors in order to keep IT professionals in their organization.

### **3.5 Personal development**

The fifth retention factor in the combined ranking is personal development. Most literature supports that personal development increases employee retention (Pawlowski et al., 2005; Carayon et al., 2006; Beecham et al., 2008; Samuel and Chipunza, 2009). We have defined one retention sub-factor of personal development: learning and training.

#### **Learning and training**

Although often mentioned in the same breath, learning and training are distinct from each other. Training is the conscious planning of knowledge transfer and skill transfer, and is usually more functional, low-level and task-orientated for the organizations. In contrast, learning is broader, more generic, long-term orientated development of individuals, so the focus is on the individual (Elena, 2001). We have bundled learning and training into one retention sub-factor, because both the literature and the interviewed young IT professionals often mention learning and training interchangeably and they both serve the same purpose in this context, namely personal development.

Mentoring is also a method to increase the learning, job satisfaction and retention of employees (Agarwal and Ferratt, 2002; Reiche, 2008; Klawe et al., 2009; Mcknight et al., 2009). Mentoring involves participation of a mentor to help a mentee in doing their job more effectively and/or help them in their career.

Increasing skills and knowledge of employees not only increases performance for the organization (D'amato and Herzfeldt, 2008), but also provides various advantages for the employees themselves. Aside from the earlier-mentioned personal development, the increase in skills and knowledge increases an employee's job mobility as it increases the employee's market

value, both internally as well as externally. Consequently, employees are able to switch jobs more easily, possibly decreasing retention (Moore and Burke, 2002; Chasserio and Legault, 2009; Coombs, 2009; Samuel and Chipunza, 2009; Steel and Lounsbury, 2009).

IT professionals, similar to other technology workers, already enjoy financial compensation that satisfies basic financial needs (Rumpel and Medcof, 2006). Therefore, IT professionals will seek to satisfy their higher-order needs (Maslow). Personal development is a factor that appears suitable to satisfy these higher-order needs. The literature focusing on IT professionals supports the notion that personal development is an important retention factor for IT professionals (Mak and Sockel, 2001; Longenecker and Scazzero, 2003; Allen et al., 2009; Ghapanchi and Aurum, 2011). Furthermore, providing learning and training serves as acknowledgement of the IT professional's strengths, serves as a signal of appreciation for the IT professional (because the organization is willing to invest in the individual) and provides opportunities for the individual to develop their skills even further (Kyndt et al., 2009).

The following quotes demonstrate that young IT professionals think that personal development is an important factor in keeping them in an organization:

*"It's not only that [career development or promotions], but it is learning something new. It's not always about promotion, I think. It is just trying to move to another area. The knowledge you gain is also an important thing."*

*"You get knowledge and skills with training and stuff... So that's all."*

Furthermore, in the IT field the pace of changes in the environment and technology is high. IT professionals need to keep up with the latest technologies (Beecham et al., 2008; Chasserio and Legault, 2009). Increasing the skills and knowledge of IT professionals through personal development provides benefits for the organization as it increases employee performance. At the same time however, increased skills and knowledge lead to an increased job-market value of these IT professionals. This in turn may lead to higher turnover, since it will increase the IT professional's job mobility making it easier for the IT professional to find a new job (Moore and Burke, 2002; Joseph et al., 2007; Chasserio and Legault, 2009; Coombs, 2009; Samuel and Chipunza, 2009; Steel and Lounsbury, 2009).

The literature indicates that IT professionals show a high learning willingness. If jobs do not offer enough personal development opportunities to satisfy the IT professional's need for personal growth, the IT professional might look elsewhere (D'amato and Herzfeldt, 2008; Tanova and Holtom, 2008; Kyndt et al., 2009).

If personal development opportunities are provided by the organization, the employee is more likely to be motivated to stay with the organization (D'amato and Herzfeldt, 2008; Tanova and Holtom, 2008; Kyndt et al., 2009). We propose that the effect of personal development is moderated by the individual characteristic 'learning orientation'. If the learning orientation of an employee is low, the personal development needs will be lower, requiring less personal development to satisfy their needs. So while personal development is a way to retain employees, at the same time it increases the employee's labor market value. Thereby, increasing the employees mobility and increasing the possibilities for turnover (Moore and Burke, 2002; Joseph et al., 2007; Chasserio and Legault, 2009; Coombs, 2009; Samuel and Chipunza, 2009; Steel and Lounsbury, 2009). IT professionals also find personal development an important retention factor

(Beecham et al., 2008), this is also supported by the interview data. However, especially with the rapid changes in technology in the IT field, personal development will increase the market value of IT professionals thus increasing their mobility.

### **3.6 Recognition**

Receiving (non-financial) recognition for good performance (Paré et al., 2001; Pawlowski et al., 2005; Beecham et al., 2008; Hall et al., 2009; Samuel and Chipunza, 2009) and receiving feedback for one's work (Thatcher et al., 2002; Carayon et al., 2006; Reiche, 2008; Ghapanchi and Aurum, 2011) are often described as important factors in retaining employees.

Recognition and feedback allow employees to learn on the job (Thatcher et al., 2002; Carayon et al., 2006; Ghapanchi and Aurum, 2011) and at the same time, recognition and feedback give employees the feeling that they and the work they do matter in the organization (Agarwal and Ferratt, 2002; Longenecker and Scazzero, 2003; Reiche, 2008). Particularly the effect 'feeling important' is significant in retaining IT professionals (Agarwal and Ferratt, 2001; Paré et al., 2001; Longenecker and Scazzero, 2003; Beecham et al., 2008). The interview data also support the importance of recognition for the young IT professionals.

*"I should feel appreciated [in my organization]"*

*"Recognition, the longer I work [at the company] I must get recognition for that. If I have worked for 10 years and they still see me as a number that's very frustrating."*

An interesting development in the role of recognition and job security for employee retention is noted by Samuel and Chipunza (2009). In their research they found that recognition is important for the new generation of 'educated' workers, which includes young IT professionals. Recognition implies that they are doing a good job and that they are important to the organization. This idea by Samuel and Chipunza (2009) is also supported by the interview data.

*"In order to feel that [connection with the company]... I really have to feel my job matters... so if I have a feeling that the decisions I make on daily basis influence the company and could benefit the company if I do my job correctly or could give the company a disadvantage if I'd destroy something or screw up... that would motivate me to do my job well and then I'd probably stick with the company."*

*"My contribution or importance in the company. It is always better to be in a company where you feel you are doing something valuable, rather than only being a cog in the machine."*

*"By happy I mean that my work is recognized. I get to do or contribute to the company and it finds my contribution valuable."*

### **3.7 Job security**

Some literature mentioned that job security is positively related with retention (Mak and Sockel, 2001; Agarwal and Ferratt, 2002; Pawlowski et al., 2005; Carayon et al., 2006; Blomme et al., 2010). Hall et al. (2009) note that, based on Herzberg's two factor theory, job security is a hygiene factor. This means that job security can only demotivate if it is not there, while not being able to motivate employees if it is there.

Many organizations restructured during the financial crisis. However during organizational restructuring, the high performers (typically characterized as having a 'high' personal growth orientation) usually leave the organization, not the low performers (Mak and Sockel, 2001). This is probably because the high performers are able to find new jobs more easily and quite possibly because they want to take charge of their own careers by choosing a new organization that can add to their personal growth and career. This will have a negative effect on the overall organizational performance.

Samuel and Chipunza (2009) suggest that for the new generation of skilled workers the role of job security has changed. Job security is considered positive feedback on their performance and for the new generation job security is a form of recognition. It is an indication that employees play an important role within the organization. If this is not possible within the current organization, employees will search for another organization that can provide for their security needs (Samuel and Chipunza, 2009). This perspective suggests that, for the new generation of IT professionals, job security is actually a motivator to produce better results in order to increase their job market worth.

Chasserio (2009) found that their sample of IT professionals had a new perspective on job security. While these IT professionals are planning their self-managed career path, leaving organizations has become part of this process. By leaving organizations and constantly learning new skills and knowledge they increase their market value and advance their careers.

Other literature focusing on IT professionals mentioned job security as an important retention factor for IT professionals (Mak and Sockel, 2001; Agarwal and Ferratt, 2002; Pawlowski et al., 2005; Mcknight et al., 2009). The interview data also supports the importance of job security for young IT professionals:

*“Did I mention security or...? This also relates to the rate at which the company is firing people”*

*“I would prefer a solid job, just to pay the regular bills.”*

Stability in the job and organization is also important for the young IT professionals, and for one respondent stability was desired specifically in higher levels of management, which is illustrated by the following quote:

*“...some companies will always keep changing, so that's not quite stable... [stability] not only for the employees, I mean for high-level managers to be more stable. If the high-level managers are stable then the company is more stable.”*

Retention can be increased by providing job security and organizational stability. Considering that high performers are usually the first to leave the organization at sign of layoffs or restructuring of the organization, it becomes apparent that job security is especially important.

### **3.8 Benefits**

There are two types of benefits that can be used to retain employees, indirect financial benefits and non-financial benefits. We only define non-financial benefits as benefits, as indirect financial benefits are included in the retention factor financial compensation. Indirect financial benefits include benefits such as health and welfare benefits and retirement plans. Non-financial benefits include benefits such as workplace child care (Rumpel and Medcof, 2006; Cardy et al.,

2007; Reiche, 2008; Hall et al., 2009; Samuel and Chipunza, 2009). Other benefits are, for example, additional vacation days (Agarwal and Ferratt, 2002; Pawlowski et al., 2005).

Cardy et al. (2007) refer to certain benefits as ‘golden handcuffs’, where employees invest into benefits such as seniority and retirement plans and the employees stand to suffer losses when leaving the organization.

An interesting suggestion by Reiche (2008) is that the use of some benefits, specifically flexibility and workplace child-care or maternity-leave programs are less important in countries that are categorized as more masculine by the author. Therefore, the effectiveness of benefits may very well be cultural and country-dependent.

Benefits seem important for IT professionals as well (Pawlowski et al., 2005; Hall et al., 2009). Especially considering that remuneration is generally sufficient, other benefits, such as additional vacation days can give an organization an edge in retaining IT professionals (Agarwal and Ferratt, 2002; Pawlowski et al., 2005).

The interview data also suggests that non-financial benefits can be important to retain IT professionals. Below are some quotes with examples of benefits cited by the young IT professionals.

*“A good cafeteria and it is clean and safe and also healthy...”*

*“Benefits like social benefits... insurance to their employees. So those kind of benefits also for instance health facilities.”*

*“One thing I really like there... since they do a lot of sponsorships, sports-related sponsorships. They let me participate in a speed-skating clinic with professional skaters. I also liked that I could get free tickets to races and stuff like that. I guess that makes me like the job a bit more.”*

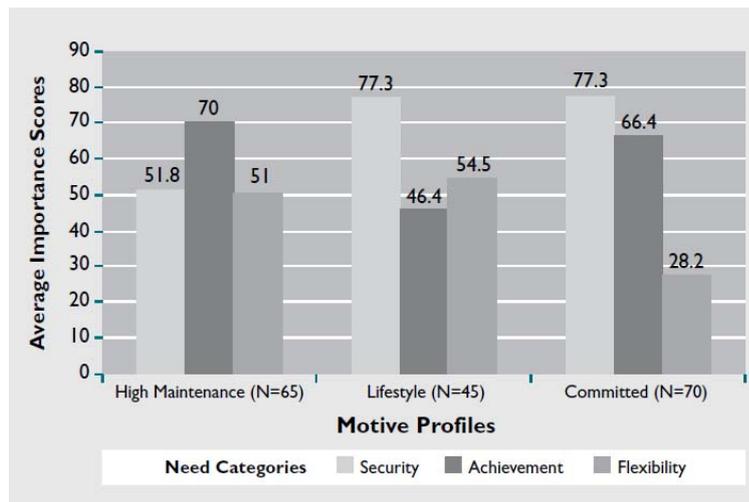
*“...maybe I would get a car... so benefits were good.”*

### **3.9 Individual characteristics**

Individual characteristics also influence retention, some directly, while other individual characteristics moderate certain retention factors. As mentioned earlier individual characteristics vary from person to person. Some individual characteristics can moderate the effects of other retention factors since individual differences can lead to retention factors having different effects (Manion, 2004).

Each individual employee has his or her own characteristics and needs. Enns et al. (2006) suggest that there are three different types of IT professionals, each with distinctively different needs. The (1) ‘high maintenance’ IT professional has lower job- and income-security needs, compared to the other two types of IT professionals. The IT professional labeled (2) ‘lifestyle’ is characterized by a lower need for career opportunities, recognition and achievement-oriented incentives than the other types of IT professionals. Lastly, the (3) ‘committed’ IT professional has, compared to the two other types of IT professionals, a lower need for flexibility in when and where they work (Enns et al., 2006). Figure 5 provides a graphical overview of the types of IT professionals and need categories identified by Enns et al. (2006).

Figure 5. Motive profiles by need categories (Source: Enns et al. (2006))



We have identified six sub-factors of individual characteristics, namely (in ranking of combined ranking): personal growth orientation, fit with job and organization, relationship orientation, career stage, organizational commitment and gender.

### Personal growth orientation

‘High’ personal growth oriented individuals (usually identified with high performance) are individuals that show high levels of personal growth and development requirements/needs. These individuals are more likely to mention career advancement as a reason to stay compared to ‘low’ personal growth oriented individuals (Hall et al., 2009; Hausknecht et al., 2009). While career advancement might be a retention factor for high performers, at the same time high performers can easily find new jobs and therefore can show higher turnover numbers (Kwon et al., 2010). However, Griffeth et al. (2000) note that high performers are less likely than low performers to leave if their performance is fairly compensated. Furthermore, high performers generally show high personal growth orientation and therefore may seek other opportunities for learning and for career advancement if they believe their current job is unable to provide this (D'amato and Herzfeldt, 2008). Therefore, personal growth orientation possibly moderates the effect of career advancement and personal development on retention. A ‘high’ personal growth orientation will have a positive influence on the effects of both career advancement and personal development on retention.

For IT professionals learning and exploring new technologies are motivational factors (Longenecker and Scazzero, 2003; Carayon et al., 2006; Joseph et al., 2007; Beecham et al., 2008). Therefore, the personal growth orientation of IT professionals is most likely quite high. However some older IT professionals possess obsolete technological knowledge. They will ignore new technologies and reassure themselves by only comparing themselves to a small group of IT professionals with similar competences. By disregarding new technologies these IT professionals become less marketable, reducing their job alternatives and increasing retention (Joseph et al., 2007). This highlights the importance of including the consideration of the individual differences and needs of IT professionals.

## **Fit with job and organization**

The fit between the expectations and perceptions of the job and organization are really the key to retaining employees, as a good fit will increase satisfaction (Reiche, 2008), motivation (Beecham et al., 2008; Reiche, 2008), commitment (Manion, 2004) and retention (Hsu et al., 2003; Longenecker and Scazzero, 2003; Tanova and Holtom, 2008; Chasserio and Legault, 2009). Conversely, a poor fit can lead to stress, dissatisfaction and a higher employee turnover (Moore, 2000; Hsu et al., 2003).

The concept of “job embeddedness” falls in line with the importance of a fitting job and work environment. Job embeddedness consists of three elements: (1) the links an employee has on and off the job, (2) the perceived fit between employee and organization and (3) the costs involved when leaving the job. The more the employee is embedded within the organization and the job, the more likely the employee will stay (Mossholder et al., 2005; Joseph et al., 2007; Felps et al., 2009; Steel and Lounsbury, 2009).

The fit with the job and organization also appears to be important for the young IT professionals in their perceptions of what would be important for them to stay in their future jobs.

*“...then how I feel in the organization, because very important for me ... if I don't feel right, If I don't feel motivated... I'm not happy so I must enjoy my work... what I'm doing must be what I like... so if I don't find that in the long run.. I'd definitely look for another job. So I just can't keep on doing what I'm not enjoying.”*

## **Relationship orientation**

Relationship orientation is defined as the importance an individual places on good relationships with his/her colleagues. A high proportion of literature notes that by creating social elements between the employee and the organization and other co-workers, the motivation (Pawlowski et al., 2005; Beecham et al., 2008; Li, 2008; Hall et al., 2009) and retention of the employee can be increased (Griffeth et al., 2000; Mossholder et al., 2005; Holtom et al., 2008; Steel and Lounsbury, 2009). Job embeddedness also suggests the importance of social elements in the job and organization in retaining employees.

Hall et al. (2009), following Herzberg's two factor theory (which notes that social elements are hygiene factors), state that social elements can only be a de-motivator and not a motivator. The effect of the social elements will depend on the relationship orientation of a person. If the relationship orientation is low, this person doesn't think social elements are important, and the effects of social elements on retention will be low (Lee, 2004).

The relationship orientation of IT professionals, especially software engineers, is suggested to be low. This is mainly because according to the researchers software engineers are characterized by introversion, suggesting a low need for social interaction (Mak and Sockel, 2001; Beecham et al., 2008). This may lead to a lower impact of social elements as a retention factor for IT professionals when compared to employees in other sectors. In contrast with this however, Coombs (2009) notes that IT professionals seem to need work that enables them to interact with co-workers and develop professional friendships. Especially for female IT professionals, Klawe et al. (2009) suggest that supplying social network opportunities (such as joining related organizations and participating in networking opportunities) will allow organizations to retain

them. This shows the importance of taking into account the individual differences and needs of IT professionals.

Among the young IT professionals, many have pointed social elements as an important factor in retaining them in organizations. Following are quotes to exemplify this:

*“Things that would keep me would be things like colleagues”*

*“You have colleagues who see you as friends that creates a great, comfortable work environment”*

*“If I would feel comfortable with colleagues as friends, than I would stay!”*

### **Career stage**

Our retention sub-factor career stage entails the length of the individual’s career. This includes previous organizations the individual has worked for and includes other (personal) life experiences the individual has gained over time.

The career stage of an individual moderates organizational commitment and thereby retention (Beecham et al., 2008). Kyndt et al. (2009) note that employees with a longer career within the organization feel strongly connected to the organization and are more likely to stay. Similarly, Tanova and Holtom (2008) found that the older the employee, the more likely this person is to stay with the organization. This indicates that a good fit between organization and employee is related to staying in the organization. However, as the career advances, the employee experiences new work and life experiences, which may change the individual’s work attitude and aspirations and consequently the fit with the organization (Agarwal and Ferratt, 2000). This indicates that career stage moderates the effects that organizational factors have on retention.

While in general the longer an employee has been working for an organization, the more likely they are to stay with the organization (Joseph et al., 2007; Mckinney et al., 2008; Tanova and Holtom, 2008; Kyndt et al., 2009; Ghapanchi and Aurum, 2011), discretion is required when looking at the effects of career stage on retention for IT professionals. Enns et al. (2006) discovered in their research that there are two types of later career stage IT professionals. One group, the ‘older-stayers’, are older employees who are more likely to stay in an organization. This group is similar to the findings of Kyndt et al. (2009) and Tanova and Holtom (2008). In contrast another group, the ‘older-movers’ show (just as the younger IT professionals) high mobility. When comparing a sub-group (characterized by a low need for job and income security) of the older career age group, Enns et al. (2006) observed several differences. The ‘older-stayers’ showed higher preferences for job and income security when compared with the ‘older-movers’ (Enns et al., 2006). These finding clearly show a differentiation is needed in understanding the needs of IT professionals and that career stage may indeed be affected by individual characteristics.

As the career stage of IT professionals advance (gaining life and work experiences), the individuals’ work attitudes and ambitions change. Consequently, the needs of the individual from the organization and the fit with the organization will change. At the start of their careers, IT professionals may see their job merely as a stepping stone (Agarwal and Ferratt, 2000). Later in life, when the IT professional has a family, there may be a higher need for both job security

and income security to support his/her family (Joseph et al., 2007). This shows that the career stage of the IT professional moderates the effects of organizational factors

The following quotes illustrate how career stage influences the needs of the young IT professionals, showing support for the moderating effect of career stage on their needs.

*“And I also would take into account that maybe some of the things I would like to see fulfilled are not fulfilled, just for getting money’s sake. But after that period has passed then get out as quickly as possible and then you change to what you want. What you really want is more important to you. So then you see why a lot of people switch after a certain period of time, because they learnt that what they thought they really value they didn’t value at all.... and then for other things maybe the other way around”*

*“For instance now I’d prefer to work for a risky organization with a good salary, but maybe five years later I’d prefer to work with a safe organization with not challenging work.”*

### **Organizational commitment**

One of the most mentioned individual characteristic is organizational commitment and as shown by many researchers, organizational commitment is positively related to retention. Organizational commitment is the affective attitude towards the organization, which is shown by the dedication the employee shows towards the organization. Furthermore, organizational commitment is often shown as an indicator of intention to leave or stay in the organization. (Griffeth et al., 2000; Manion, 2004; Ahuja et al., 2007; Blomme et al., 2010; Kwon et al., 2010). This by itself suggests the importance of organizational commitment in retention.

The expectations of the job are also important for organizational commitment. Following are two examples of how expectations of the job can influence organizational commitment of employees. Depending on whether the contract is transactional or relational, employees will adjust their attitudes and obligations towards the organization accordingly, which is reflected in organizational commitment (Hausknecht et al., 2009). Similarly, individuals that merely see their job as a stepping stone will show different commitment than those who seek a long-term career with the organization (Agarwal and Ferratt, 2000).

### **Gender**

Gender differences are found in the literature, indicating that the importance of balancing work and family life in the retention of employees may be moderated by gender (Armstrong et al., 2007; Blomme et al., 2010). Their findings suggested that women indicated that work and family balance is a significant retention factor, while work-life balance was less significant for men in their research populations. Therefore, we propose that gender moderates the effects of balance of work/family life balance.

## 4. DISCUSSION

In this chapter we discuss the main research findings. First, we review the general findings, the practical relevance of this study, and finally strengths and limitations of this study and avenues for future research.

### 4.1 General discussion

This research focused on examining factors that motivate IT professionals to stay productively working in an organization. We have used theories from talent management, self-determination and human capital theory to gain new insights into our research findings.

In light of the recent financial crisis, IT expenditures and the role IT has in organizations has changed. The focus of organizations to decrease costs and increase performance is also reflected in the priority of IT concerns for managing human resources. The focus of organizations changed to increasing skills and productivity of IT professionals. Furthermore, the allocation of budgets has shown a relative decrease in funds for IT infrastructure and a relative increase for staffing (in percentage of the total budget). Shortly after the financial crisis, organizations across many industries had financial problems and their employees (including IT professionals) were afraid they might lose their jobs and found it difficult to find job alternatives in organizations that were not affected by the financial crisis. Consequently, employees supported their employers by not asking for raises or allowing their salaries to be reduced. This was in an effort to avoid solvency problems for their organization (Laumer et al., 2011). This trend of relatively increased budgets towards staffing indicates that organizations increased investments in training and development of IT professionals. Research by Luftman and Ben-Zvi (2010) has shown that HR priorities have changed in organizations since the financial crisis. Personal development (both developing interpersonal skills and business skills in IT) have gained high priority. In the study, 45% of the US respondents indicated interpersonal skills as important and 35% development of business skills in IT. In comparison retaining (7%) and recruiting (5%) IT staff were left far behind as priorities. This suggests that organizations have compensated for the lesser increase in financial compensation (due to the recent financial crisis) by offering personal development programs to their IT professionals. Providing IT professionals with training programs is good use of their time and they may be able to apply their new knowledge, skills and abilities right away in the organizations and in future projects. As our findings suggest, as long as the financial compensation meets the IT professional's basic financial needs, providing personal development opportunities can be a great incentive to retain IT professionals. IT professionals are likely to seize the opportunity for personal development to increase their market value, while possibly waiting for new projects to arrive for them.

Over the past few decades in the role that IT plays in organizations has changed. Research has indicated that in this time period, the role of IT in organizations has been transformed from a back-office role to a more frontline and strategic role, developing and supporting the business needs of the organization (Kakabadse and Korac-Kakabadse, 2000; Roepke et al., 2000). Especially smaller organizations, which have limited resources available, are often compelled to seek external IT support. For smaller organizations, IT outsourcing can be beneficial. Smaller organizations will not have to go through recruitment and selection to find good IT personnel, which is already scarce. Additionally, they can use external expertise to gain know-how. However, it remains paramount that smaller organizations remain knowledgeable about IT

applications and services, in order to make optimal use of IT applications and external IT services (Furtmueller et al., 2010b; Siqueira and Fleury, 2011).

Smaller organizations have to make due with fewer resources compared to larger organizations. For example, for smaller organizations it is more difficult to provide personal development programs due to budget and time constraints. Also, organizational image might be an important aspect in attracting and retaining IT professionals with 'high' personal growth orientation (and likely highly effective IT professionals, since they are associated with having 'high' personal growth needs). Generally, larger organizations are viewed as providing more possibilities for personal growth (e.g., larger budgets for personal growth and more flexibility in personnel to free up time so that one employee can follow a training program), and therefore, will have an advantage in recruiting and retaining IT professionals with 'high' personal growth orientation. These findings suggest that likely the smaller organizations will have the most difficulty in recruiting and retaining highly effective IT professionals.

Conducted in the aftermath of the economic crisis, our interview data suggests that the work environment (mentioned by 76% of the young IT professionals) and social elements (48%) in the work are important for the young IT professionals in the current economic climate. Especially when we compare it with the data from the literature (work environment (30%) and social elements (30%)), indicates that there has been a change since before the financial crisis. The work environment was often mentioned first by the young IT professionals, indicating this is the first factor that comes to their mind. These two findings suggest that perhaps after the financial crisis the young IT professionals are looking for stability and are looking for an organization that will provide a suitable setting to work in. This suitable setting concerns not only a fitting organizational climate and culture (mentioned by 33% of the young IT professionals), but also concerns the work environment and social elements. The young IT professionals want a pleasant working environment and good relations with their colleagues and managers.

*“The people I have to see every day... my colleagues... so the culture at this point of time, in the longer run become very important for me [in staying in an organization].”*

*“I'm thinking about the fit between the company values and personal values...this sounds very general, but in the long run this is important [in keeping me in an organization].”*

Job content also appears to be an important aspect in this fit. Job content has been mentioned by nearly half of the young IT professionals (43%). Most of the young IT professionals appear to be interested only in doing interesting and challenging jobs.

*“The work place is important for retaining [me in an organization]... and ... the job, if it is challenging and exciting.*

*“I also like the intellectual challenge, the more complex the questions and making the questions answered is very interesting.”*

Career advancement has also been mentioned more often by the IT professionals compared to the authors from the literature. This retention factor has been mentioned nearly twice as often by the young IT professionals (71%) compared to the authors (36%) in the literature. This seems to indicate that career advancement has become more important since the financial crisis for the

young IT professionals. This may be an indication that the young IT professionals are looking for self-development, showing 'high' growth orientation.

*“So I think I would be loyal if I get the chance to advance my career.”*

*“Career advancement is important too, it has to be multicultural and multinational. And also career enhancement programs... like Google and IBM...”*

The above quote indicates that, for some of the IT professionals, not only career advancement is important, but also the more interesting (international) environment could be interesting. Usually the bigger organizations are able to provide these environments, suggesting that some of the young IT professionals will prefer working in larger organizations. Moreover, larger organizations are also able to provide more possibilities for personal development, since larger organizations are more flexible with regards to budget and time. Also, larger organizations tend to be able to provide more organizational stability and job security. This is mainly due to the resources that larger organizations have and because larger organizations will be less dependent on individual employees or managers. The apparent need for stability of some young IT professionals (29%) seems to fit better with larger organizations.

*“Of course... stability... looking for a new job could be a stressful situation... adapting to a new company.”*

*“Did I mention security or...? This also relates to the rate at which the company is firing people”*

Especially given the recent financial crisis, organizational stability and job security has become an issue for many employees, including IT professionals. Although the young IT professionals still know they are in high demand. On the question why IT professionals change organizations so often, one young IT professional replied as follows.

*“They are wanted! That is everything... it is definitely interesting.”*

This illustrates that at least some of the young IT professionals still perceive the job market as favorable for the IT professional. Nonetheless, it appears that job stability is preferable to some of the young IT professionals and it is likely that the young IT professionals are looking for a stable job that is suitable for them in regard to work environment, social elements and job content. Something else to consider is the notion by Samuel and Chipunza (2009), that job security has become a form of recognition for the new generation of highly educated employees. They suggest that job security shows that they are doing a good job and are needed in the organization. This may also be true for the young IT professionals and they may seek job security not just to safe, but rather to feel validated and wanted in the organization. This is more likely considering that in the current job market it is not difficult for IT professionals to find a new job and there is no real need to be afraid to be out of a job.

Lastly, financial compensation has been mentioned by over half of the young IT professionals (57%). Showing that, at least for the young IT professionals, financial compensation is important. However, other factors (mainly work environment and social elements) are probably ultimately more important than financial compensation.

Our research suggests that high performing individuals receive higher financial reward. Highly effective employees are usually associated with high performance and therefore are likely to receive above-average financial compensation as a result. The highly effective IT professional

will think that he or she is rightfully receiving more financial compensation and will perceive a positive organizational fairness. The financial rewarding, career advancement opportunities and the benefits provide by the organization all costs money. Since organizations are likely to reduce costs in times of financial crisis, the previously mentioned retention factors are likely to be affected by the financial crisis. Studies have indicated a lower growth of financial compensation due to the financial crisis (Laumer et al., 2011), and this may also include promotion. Lastly, benefits may have been retrenched in order to lower organizational costs. Perhaps lateral movement has increased in order to reduce costs. Instead of hiring new employees to fill the job, organizations may place idle workers into these jobs. The reduction in financial rewards, career advancement opportunities and benefits may have a negatives effect on retention. However, it is likely the high performers, the highly effective IT professionals, who will leave the organization during these reorganizations (Mak and Sockel, 2001). Therefore, these cost saving measures may in fact be counterproductive in retaining highly effective IT professionals.

In general, the frequencies of salient retention factors appear to be similar in the literature and the interview data. This means the interview analysis confirms the literature analysis. One of the more interesting results of the relevant retention factors is that social elements are among the most important factors in the retention of IT professionals. Often IT professionals are characterized as introverted, which would indicate a low need for social interaction (Mak and Sockel, 2001; Beecham et al., 2008). This stereotype of an introverted IT professional is likely derived from the image of a 'nerd' sitting behind the computer writing 'screen after screen' full of programming codes. Our findings however, suggest that for half of the interviewed young IT professionals (48%), social elements are highly important as a retention factor. This is also supported by literature. Coombs (2009), for example, notes that, although traditionally IT professionals are thought of as having low need for social interaction, their research indicated that IT professionals appear to need the opportunity to work in teams and being able to develop professional friendships. In regard to self-determination theory, the need for social elements can be explained as part of the relatedness needs. We propose research should differentiate clearly between various groups of IT professionals and that they may not differ so much from other professional groups in their need for social interaction. Some individuals are motivated to stay in an organization when they have good relationships with colleagues and get recognition from their colleagues for contributing to projects. Others desire to gain recognition from peers in communities other than the direct work environment (e.g., online communities). These IT professionals want to be able to do their work efficiently and want to contribute to and gain recognition from that community (e.g., open source community). These individual differences suggest that a moderating effect may exists between relationship orientation (i.e., the degree to which an individual desires good relationships with colleagues) and social elements (e.g., working in teams) in retaining IT professionals.

We propose that highly effective IT professionals have a different needs compared to other IT professionals. Talent management theory already indicated that recruiting and retaining highly effective individuals requires a process, of selection, recruiting, retaining and developing (both in personal development and career) focusing and adjusted specifically to integrate these highly effective individuals into the organization (Groves, 2011; Joshi and Agarwal, 2011). This approach supports proposition that highly effective IT professionals need a different approach compared to retention in general and a fit needs to be created between the highly effective IT professional and the organization and the job.

Highly effective IT professionals are more likely to have 'high' personal growth orientation. Generally, IT professionals want to have interesting and challenging work to make them stay in the organization. Especially highly effective individuals may see completing challenging tasks as opportunities for personal growth, a sign of recognition (that they are able to tackle difficult tasks) and may provide personal satisfaction. This idea is also supported by self-determination theory, where completing challenging tasks is shown to fulfill competence needs and increases retention (Preenen et al., 2011).

Furthermore, the fast-paced technology development in the IT field makes it crucial to keep investing in personal development. Therefore, IT professionals in general show higher personal growth orientation compared to other fields (Longenecker and Scazzero, 2003; Carayon et al., 2006; Joseph et al., 2007; Beecham et al., 2008). Taking this in account and adding that highly effective individuals are more likely to indicate the lack career advancement and/or personal development as a reason to leave an organization, compared to lower performing individuals (Hall et al., 2009; Hausknecht et al., 2009), we propose career advancement and personal development are even more important in the retention of higher performing IT professionals, compared to lower performing IT professionals. Our research data supports the importance of career advancement and personal development, since both career advancement (number three) and personal development (number five) are ranked in the top five of the combined ranking.

Our findings suggest that in order for some IT professionals to stay in the organization, the organization needs to offer job security. Mak and Sockel (2001) note that the high performers are the ones that will leave an organization in sight organizational instability (such as downsizing). Also, Samuel and Chipunza (2009) show that job security has become a sign of recognition to IT professionals, an indication that they are contributing to the organization. These findings suggest that providing IT professionals (including highly effective IT professionals) job security, may motivate them to stay, even when downsizing is needed. Organizations should convey the importance of their highly effective IT professionals by providing job securities to these individuals. This could lead to an even more motivated highly effective IT professional (by showing them they are needed in the organization) and may help retain the highly effective IT professional.

Regarding financial compensation, a few remarks should be made. The literature is varied when it comes to the effects of financial compensation on retention. While some authors stated that financial compensation plays an important role in the retention of IT professionals (Agarwal and Ferratt, 2001; Longenecker and Scazzero, 2003; Kwon et al., 2010) others argue that financial compensation has a small or even insignificant role in retaining IT professionals (Moore and Burke, 2002; Blomme et al., 2010).

A possible explanation for this is contextual influences, an example is given by Samuel and Chipunza (2009). They have shown a difference between private and public sector in regard of the importance of financial compensation. Employees working in the private sector preferred intrinsic financial compensation and were influenced by intrinsic financial rewards

Another explanation for the diverse results is given by Uzoka et al. (2011). They note that career change moderates the importance of financial compensation. While younger IT professionals are more drawn to financial compensation, older IT professionals seek achievement and to gain and authority. Furthermore, a discrepancy exists between how managers and employees view the role of financial compensation in regard to retention. So, quite possibly, researchers may get different

results depending on the unit of focus. Our own empirical data suggests that for young IT professionals financial compensation is important.

An alternative explanation for the different results in the literature is that financial compensation has become a hygiene factor (Herzberg), as described in detail in the previous section. This idea is also supported by recent research, Khazanchi and Owens (2011) also note that non-financial retention practices are more important than financial compensation in retaining IT professionals. Drawing upon self-determination theory, there is also support for this idea. Self-determination theory notes that there are three basic needs that need to be satisfied (autonomy, accomplishment and relatedness) (Ryan and Deci, 2000). This does not directly include financial payment, but individuals might have accomplishment needs that include earning a certain level of payment. We will discuss our results in light of self-determination theory in more detail in the next paragraph. Recent research indicates that ‘competitive’ and ‘fair’ compensation is important for IT professionals (Lumley et al., 2011). This suggests that financial compensation needs to provide at least the market-level standard of comfort and needs to be perceived as fair, compared to the contribution of the IT professional and his/her colleagues.

Lastly, the effects of intrinsic financial compensation, especially stocks and stock options, will depend on government tax policies. The effectiveness of such policies depend on how intrinsic financial compensation is taxed (i.e., how much the employee will actually receive after taxes) and thus can vary. These tax structures should be taken into account when devising such intrinsic compensation policies. Stocks and stock options have been especially affected by the financial crisis. With the drop in stock values during the financial crisis, the value of stocks and stock options dropped significantly. This may render stocks and stock options less effective as a rewarding system during times of financial crisis.

Regarding personal development, a few remarks should be made. There are two different types of training, organizational-specific and general training. While in general organizational-specific training acts to increase retention (because it is not easily transferable to other organizations), general training makes it easier for the employee to leave the organization (decreases retention) because it is easily transferable to other organizations. However some employees, and in particular IT professionals (working a fast-paced changing environment), require training in order to satisfy their personal growth needs and to retain these individuals. However, for IT professionals, learning organizational-specific training may also increase the IT professional’s marketability. Even though programming languages can be different from each other, the principles of applying these programming languages are the same. This implies that experiences in certain organizational-specific knowledge in the IT field are easier transferable compared to other organizational-specific knowledge. This is in line with human capital theory. Human capital theory also notes the difference in transferability between organizational-specific human capital and general human capital. While it is clear that organizational-specific human capital is less transferable (and increases retention), investing into generic training remains important nonetheless. Research indicates that investments in generic human capital are needed to create organizational-specific human capital over time (Ployhart et al., 2011). These findings suggest that organizations should keep investing in the personal development of IT professionals, in order to retain IT professionals and in order to create long term competitive advantages for the organization.

As mentioned earlier, self-determination theory sheds another light on our findings. The retention sub-factors that are ranked high in the combined ranking can be seen as fulfilling the

basic needs from self-determination theory. Social elements are important in the fulfillment of relatedness needs. The other retention sub-factors---work environment, promotions and job content---can be seen as fulfilling, or helpful in fulfilling, autonomy and competence needs. A good work environment enables the individual to accomplish tasks more easily, while a poor work environment might frustrate the accomplishment of tasks. Promotions might, for some individuals, be recognition for performance and can be considered proof of competence (thereby fulfilling competence needs). Adequate job content (i.e., providing challenging tasks) is needed so that the individual can fulfill autonomy and competence needs by successfully completing challenging tasks. Challenging tasks will not only fulfill basic needs, but also increase retention and on-the-job learning (Preenen et al., 2011). Regarding the financial compensation, our results can be explained by self-determination theory as follows: While individuals might have a financial component in their needs, once these financial components are fulfilled (i.e., once they receive sufficient financial compensation to meet their basic financial needs), the other aspects of their basic needs will need to be satisfied. Therefore, non-financial factors might start to become important, as these will enable the individual to fulfill his/her remaining basic needs.

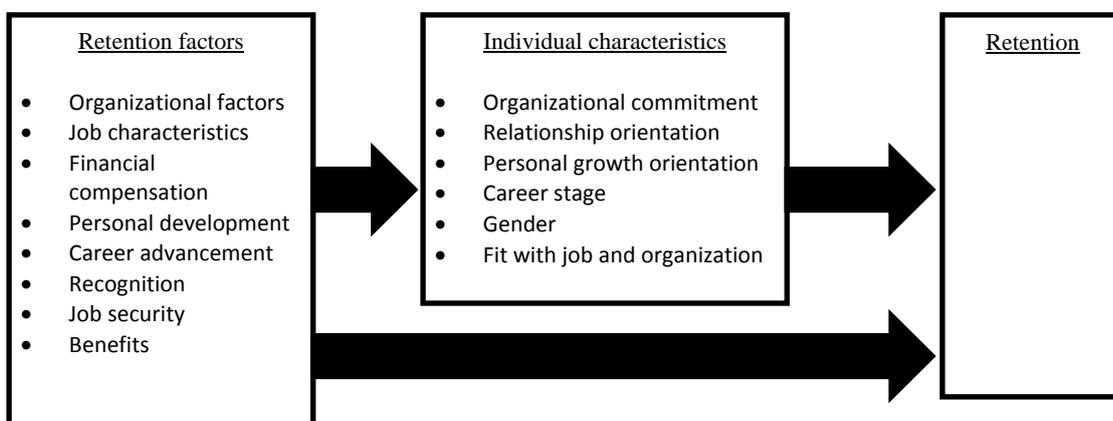
### Individual characteristics

As discussed earlier in this section, based on our findings we propose that individual characteristics do not only influence retention directly, but also moderate the effects of certain factors in the retention of IT professionals. We will discuss these relationships below.

First of all, certain retention sub-factors of individual characteristics (i.e., organizational commitment and fit with job and organization) have a direct influence on retention. ‘High’ organizational commitment leads to higher retention (Griffeth et al., 2000; Kwon et al., 2010). Likewise, a good fit between the IT professional and his/her job and organization will lead to higher retention (Tanova and Holtom, 2008; Chasserio and Legault, 2009).

Our findings also suggest that certain retention sub-factors (i.e., relationship orientation, personal growth orientation, career stage, gender, fit with job and organization) moderate other retention factors. Figure 6 shows a simplified model of this idea/concept. Next the relationships between the individual characteristics and the retention factors will be discussed in more detail.

Figure 6. The moderating effect of individual characteristics on the retention factors



We define relationship orientation as the importance an individual places on social elements in the work environment. As discussed earlier, relationship orientation seems to vary between

individual IT professionals. This suggests that relationship orientation moderates the effects of social elements in the retention of IT professionals. If an IT professional has 'high' relationship orientation, he/she regards social elements in the work environment as important for staying in an organization. This increases the positive effect that social elements have on the retention of that IT professional. Conversely, IT professionals with low relationship orientation will not find social elements important (in his/her work environment). Subsequently, the positive influence of social elements on the retention of IT professional with low relationship orientation is lower compared to the IT professional with higher relationship orientation.

We also propose that the personal growth orientation of an employee moderates the positive effects of personal development and career development on retention. Looking at the IT literature, Beecham et al. (2008) state that learning new technologies is motivational for IT professionals and thereby serves as a retention factor. The interview data supports this notion: around 30% of the interviewees mentioned personal development as an important factor for them to stay in an organization. The literature also shows support for the moderating effect of personal growth orientation on the retention of IT professionals. An individual with a higher focus on personal growth is suggested to value career advancement as more important in retention compared to an individual with a low focus on personal growth (Hall et al., 2009; Hausknecht et al., 2009). Moreover, 71% of the interviewees mentioned promotions (upwards mobility) as an important factor for them to stay in an organization. These findings suggest that a high number of IT professionals are concerned about their career development prospects, which is also supported by the literature data (Agarwal and Ferratt, 2001; Beecham et al., 2008; Ghapanchi and Aurum, 2011). Some authors note that IT professionals want to satisfy their higher-level needs (Maslow) (Lee, 2000; Rumpel and Medcof, 2006). This provides a possible explanation for the 'high' personal growth orientation of IT professionals. Because IT professionals already receive competitive payment (Agarwal and Ferratt, 2001) they may seek to satisfy other, higher order needs. The importance of personal growth is also supported in research by Uzoka et al. (Uzoka et al., 2011). They note that their research population showed a strong need for personal development and would change job to seek organizations that can fulfill their development needs. This would mean that other factors will become more important in retaining IT professionals, once their basic financial needs are met.

Our findings regarding the role of career stage is also supported in recent research. Our results suggest that the longer an employee has been working for an organization, the more likely they are to stay. This notion is also supported by the IT literature (Joseph et al., 2007; Ghapanchi and Aurum, 2011). Enns et al. (2006) identified another group of IT professionals with 'high' career stage (i.e., 'older-movers'). This group of older IT professionals is characterized by high mobility, and a lower need for job and income security. Recent research by Fu (2011) also supports differentiation between IT professionals: while younger IT professionals tend to see the obsolescence of knowledge and skills (due to the fast changes in technology) as an opportunity to learn and become more competent, in later stages of their career IT professionals start to see the obsolescence as a threat and some might lose the confidence they once had. Interestingly, Fu's (2011) research also indicated that, while younger IT professionals believed that their previous career investments (e.g., time and training) 'trapped' them in their career path, older IT professionals did not perceive previous investments as a lock-in. This may be why some of the older IT professionals switch jobs, and use their experience in other fields in other organizations ('old-movers'). Furthermore, Uzoka et al. (2011) note that some young IT professionals perceive

compensation for their performance as unfair. They perceive their knowledge of new technology and skills equal or even better compared to that of older IT professionals, which may lead to dissatisfaction.

Recent research on career anchors provides other insights into the role of career stage in retention of IT professionals. At the earlier stages of the career of IT professionals the technological component of internal career anchors are important. Despite the fact that most IT professionals will transfer to managerial functions, research indicates that technological anchors remain important among IT professionals in their middle and later career stages. Instead, these IT professionals develop new career anchors (autonomy, geographical security, management). Senior IT professionals need to keep up to date with current technologies to keep their value in the IT field. This is why, for IT professionals, the technological component will remain important throughout their careers (Chang et al., 2011). Taking these finding into account, we propose that organizations should develop (longer-termed) personal development plans (both career and personal growth) together with the IT professional himself/herself.

The fit with the job and organization has a direct influence on retention (Hsu et al., 2003; Longenecker and Scazzero, 2003; Tanova and Holtom, 2008; Chasserio and Legault, 2009). Foremost, a good fit between the individual and job characteristics and organizational factors is important in retaining IT professionals. This means that how well the fit is (between the individual and job characteristics and organizational factors) will determine the effect of job characteristics and organizational factors on retention for that individual.

The considerations mentioned above clearly illustrate how individual characteristics moderate the effects of certain retention factors. This shows that researchers and managers of IT professionals need to bear in mind individual characteristics when considering the effect of retention factors on IT professionals. Each IT professional has different needs and values retention factors differently. More research is required to examine the relationship between individual characteristics and retention factors. Furthermore, the effect of gender in the retention of IT professionals may be worth studying. Armstrong et al. (2007) and Blomme et al. (2010) indicated differences between the genders with regard to retention.

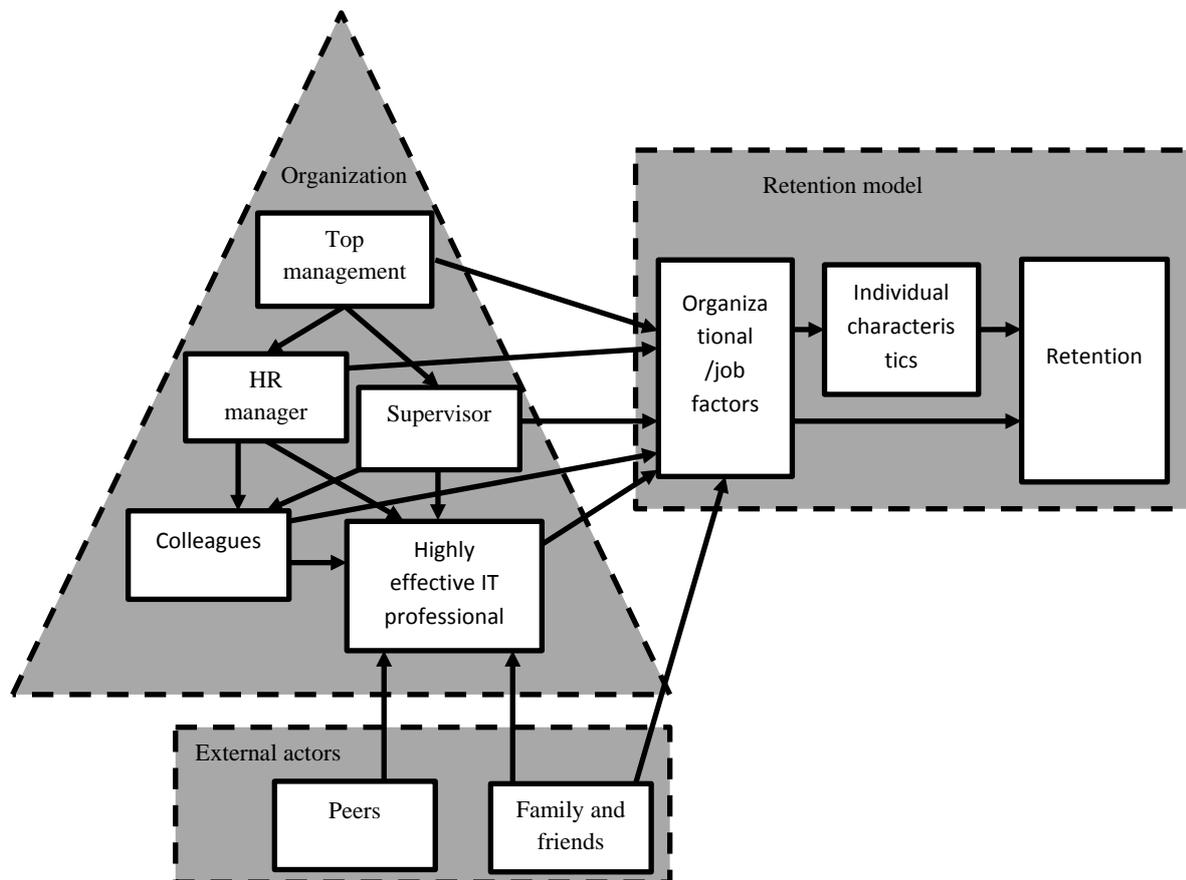
### **Extending our retention model**

We extend the retention model by taking a multiple-constituency approach to the retention of highly effective IT professionals. This gives us insight into the different actors that are involved in the performance evaluation of highly effective IT professionals. We have adapted the multiple-constituency approach to include external actors (i.e., family and friends and peers), which do not take part in performance evaluation of the IT professional. These external actors are likely to have direct influence on the retention of IT professionals. This gives us a broader contextual overview of the relations between the different actors within the organization.

The retention factors that we found in our research are all factors or characteristics of the organization or job and therefore are (at least partly) influenced by certain organizational actors. We propose that the supervisor, HR manager and top management may have influence on the organizational and job factors (see Figure 7) and serve as an extension to our retention model, placing our retention model in an organizational context. On the one side we have the organization with its actors, and on the other side we have our retention model. Regarding the performance evaluation from a multiple-constituency approach we propose the following

relationships: (1) The evaluation of the performance of the IT professional is done by the supervisor and the HR manager. The supervisor might have different criteria on how effective an IT professional may be compared to the HR manager. (2) The top management of the organization has their own perspective on the effectiveness of IT professionals and may convey their perspective to the supervisor and HR manager. (3) The colleagues of the IT professional may also be involved in the evaluation of the IT professional's performance through peer-review or other feedback practices. (4) Peers from outside the organization and family and friends are not likely to be involved in the performance evaluation of the IT professional. Further, we propose the influence of the actors on the retention factors as follows. (1) Organizational and job factors are influenced by the supervisor, HR manager, top management, colleagues and the IT professional. While the supervisor and colleagues may have direct influence on the work environment and social elements, other actors (i.e., top management and HR management) may have less direct influence on organizational and job factors. Top management and HR manager sets the policies on, for example, payment levels and social events like Friday afternoon drinks. (2) Peers from outside of the organization may influence retention of the IT professional as well. These peers may be from other organizations and met through, for example, conferences or training/education provided by external parties. They may, for example, give the IT professional insights into how things (e.g., work environment and payment) are in other organizations. (3) Family and friends may also influence the retention of the IT professional. They may have direct influence on the IT professional in the decision to stay. The IT professional may ask his friends and family advice on how they perceive his/her job and if he/she should stay or leave. Also, family and friend may influence the work-family balance of the job characteristics, depending on the needs of the IT professional's family and friends. If the IT professional's family and friends require more time from the IT professional, this will likely have a negative influence on the perception of work-family balance.

Figure 7. Multiple-constituency approach on the retention of highly effective IT professionals



There may be other actors that we have not included in our model. Future research should try to find other actors, verify and further extend this model.

#### 4.2 Practical implications

This research contributes to practice in different ways. First, we contributed by identifying eight retention factors that motivate IT professionals to stay in an organization. Also, we have identified one factor, individual characteristics, that we propose not only directly influences retention of IT professionals, but also moderates other retention factors. Our findings are based on a rigorous literature review combined with interview data. We identified five retention factors (organizational factors, job characteristics, career advancement, financial compensation and personal development) as being most important in retaining IT professionals. These retention factors were mentioned most frequently in both the literature and by the interviewees.

Second, we provide an overview of how retaining highly effective IT professionals differs from retaining other IT professionals and employees of other sectors. We propose that process of retaining highly effective IT professionals should be part of an integral process that focuses on integrating highly effective IT professionals into the organization throughout the selection, recruitment, retention and development (both personal development and career advancement) processes. Organizations should satisfy higher order needs (Maslow) of the highly effective IT professional and should provide challenging work, opportunities for career advancement, personal development programs and organizational stability and job security.

Third, our findings suggest that the usual cost-saving measures undertaken by organizations are actually counterproductive in retaining highly effective IT professionals. In fact, it is more likely that the organization will lose its highly effective IT professionals due to the reorganizations (Mak and Sockel, 2001) and remain stuck with less productive employees. This may in fact cause organizational productivity to decrease and eventually lead to loss of competitive advantage. Therefore, we propose that organizations should try to find other ways to reduce costs in the organization, or at least take into consideration the possible negative outcomes of cost-saving measures. It is probably preferably to enter into dialogue with the highly effective IT professionals and work out a personalized development plan, which ensures that the IT professional has growth and development opportunities. This will also enable the IT professional to fulfill autonomy needs, as he will have a contribution to the planning of his career.

Third, we propose that financial compensation has become a hygiene factor (Herzberg) for IT professionals. This means that when financial compensation is insufficient to meet the individual's basic financial needs (this may differ for each individual) they can be a de-motivator (hygiene factor). However, once payment level is sufficient to meet the individuals basic financial needs it will not help motivate the individual. We propose that once the basic financial needs of the IT professional are met, other retention factors play a more important role for the IT professional in staying with an organization. The role of financial compensation is also important as a measure of recognition as a confirmation of their worth to the organization. Therefore, the level of payment should at least provide the market-level standard of comfort as an indication that they are valued employees in the organization. Furthermore, organizations should focus on other ways to differentiate themselves from other employers. They should focus on the other retention factors and on creating a good fit between the IT professional and the job and organization. This can be done by providing sufficient payment and stimulating a good work environment, good social elements in the organization, interesting job content and good possibilities for promotions and personal development within the organization. This will enable the organization to provide an attractive package to retain highly effective IT professionals.

This brings us to the third contribution to practice, the importance of personal development. Providing personal development can be useful for retaining IT professionals, but can also lead to higher turnover. Literature suggests that by increasing the value of the IT professional (through encouraging personal development and stimulating personal growth) there is a risk of higher turnover. Personal development increases the IT professional's job value and subsequently increases his/her ease of movement (Chasserio and Legault, 2009; Coombs, 2009; Steel and Lounsbury, 2009). While many organizations portray themselves as encouraging personal development and stimulating personal growth, many of these organizations are already coping with issues arising from the increase in the value of IT professionals on the job market. Many organizations protect their investments (i.e., the costs of providing personal development opportunities to their employees) by requiring their employees to stay a certain period of time thereafter or pay back the costs of the personal development. However, we propose that this is a calculated risk organizations will need to take in order to retain IT professionals and increase organizational performance. The employers may reduce this risk by introducing payback requirements for when employees leave the organization shortly after receiving personal development programs. Furthermore, organizations should try to increase retention by providing and facilitating (longer-term) personal development plans. This should incorporate the important retention factors we have found in our research (i.e., financial compensation, personal

development and promotions). Self-determination theory suggests that involving the IT professional in the process of creating the development plan will increase intrinsic motivation to follow the plan, which will increase the success of the development plan in retaining the IT professional.

Last, we propose that there are individual differences that organizations should take into consideration in retaining IT professionals. We already touched this idea by proposing a personal development plan. Social elements, for example, can be important for some IT professionals, and retention can be increased for these IT professionals by providing social elements in their work environment, such as working in teams and providing social events (e.g., Friday afternoon drinks). Other IT professionals, on the other hand, do not need such social elements. Therefore, organizations need to be flexible in providing social elements, and should seek ways to satisfy both groups. Friday afternoon drinks could, for instance, be on voluntary basis, so those that want to go can go, while those that do not desire social elements can skip the drinks. Creating a good fit between the IT professional and the job and organization is very important in the retention of IT professionals.

### **4.3 Strengths, limitations and future research**

Most of the previous research has used quantitative or conceptual methods. We contribute to the research by exploring retention of IT professionals and using qualitative methods (combining a rigorous literature review with an interview analysis). This mixture of methods has not been widely used in previous research and our research has shown various new insights into the retention of IT professionals.

Firstly, though there exists extensive literature on retention in general, there is relatively little literature that focuses primarily on the study of retention of IT professionals. We have created an overview of past literature on IT professionals and adding new data from our own interviews, gaining insight into the perspective of young IT professionals in the current economic climate.

Second, we propose specific characteristics regarding the retention of highly effective IT professionals, which are unique to this group of IT professionals. Highly effective IT professionals are likely to show 'high' personal growth orientation and desire fulfillment of higher order needs (Maslow). This can be achieved by providing challenging work, opportunities for career advancement, personal development programs and organizational stability and job security. Furthermore, in light of Samuel and Chipunza (2009), the role of job security may have changed for the new generation of highly effective IT professionals. For these IT professionals, job security may have become a form of recognition, a sign that they are wanted and needed in the organization. Future research should set out to verify our propositions and to seek other characteristics that make highly effective IT professionals unique.

Third, our findings suggest that IT professionals should be divided into groups with different characteristics. For example, our data suggests that social elements are important for a large portion of the interviewees. This contradicts some of the literature and the typical image of a software engineer sitting behind his desk writing 'screen after screen' of code, with little need for social interaction with his/her work environment. Similarly, individuals with 'high' personal growth orientation will regard personal development and career advancement as more important in retention when compared with individuals with lower personal growth orientation. Future

research should focus on identifying different individual characteristics that moderate retention factors and seek to further explore and verify these relationships.

Fourth, we have discussed our findings in light of the financial crisis. We have explored what effects the financial crisis has had on the retention of IT professionals. It becomes clear that the cost-saving measures usually taken in financial crisis may ultimately be counterproductive in retaining highly effective IT professionals. Future research should set out the further explore our ideas and seek to validate these ideas.

Fifth, we shed light on the apparently contradictory findings in previous research on the role of financial compensation in retaining IT professionals. Previous research has shown results varying from very important to not significant at all. Possibly the unit of focus and contextual factors caused these varied results. We propose that, for IT professionals, financial compensation has become a hygiene factor (Herzberg). Financial compensation, if not sufficient to meet the individual's basic financial needs, will act as a de-motivator and may cause the IT professional to seek employment elsewhere. At the same time, higher financial compensation will not necessarily lead to motivation and retention of the IT professional, because he/she will seek to satisfy other (higher order) needs (Maslow). These will likely be factors such as work environment, personal development, career advancement and social elements in the work environment. Further research should be undertaken to find support for this idea and to explore the relationship between financial compensation and retention in further detail.

Sixth, our findings suggest that providing training to highly effective IT professionals is important. Especially in fast-changing environments such as the IT field, keeping up to date on the latest technology is important. Moreover, highly effective IT professionals are likely to be more orientated towards personal development and career advancement. However, the actual effect of personal development is unclear. While IT professionals require personal development to retain them in the organization, at the same time training increases the marketability of these IT professionals. In general, organizational-specific training tends to increase retention and general training can increase retention. However, certain organizational-specific training might be more easily transferable compared to other sectors. Future research should further explore the role of training in retaining highly effective IT professionals and may seek to find ways to cope with the dualistic nature of training in retaining IT professionals.

Seventh, we have drawn upon theories from other fields, such as talent management, self-determination theory and human capital theory, to help explain and further explore our findings. For example, talent management suggests that retaining highly effective IT professionals should be done through an integral process. This process should seek to integrate highly effective IT professionals throughout the selection, recruitment, retention and development (both personal development and career advancement) processes. Another example, self-determination theory suggests that once the basic financial needs are met (this could be considered an accomplishment need for some individuals), fulfilling other basic needs will become important. Future research should test our propositions that incorporate these other fields and perhaps can identify theories from other fields that can be a useful addition to further explore retention literature and help us understand how to retain highly effective IT professionals.

Eight, our multiple-constituency approach to review the organizational context of our retention model gives us insight into what actors might be involved in the performance evaluation of

highly effective IT professionals and other actors that may be involved in the retention of IT professionals. This gives us a grounded base for future research in how to implement HR practices and what actors should be involved in the implementation of these HR practices. Future research could further explore this model for validity, other actors and extensions.

Ninth, when comparing the frequency of what the interviewees mentioned as important retention factors with the frequency of the views of the authors from the literature for each retention sub-factor, some interesting gaps are revealed. While work environment (excluding social elements) is mentioned by 74% of the interviewees, it is only mentioned by 30% of the authors from the literature (a difference of 2.5 times). Promotions has an even larger gap (over 4 times), between the interviewees (79%) and authors from the literature (19%). These gaps may be an indication that these factors have not received enough focus in past research. Perhaps future research can further explore the effects of work environment and promotions on the retention of IT professionals

Finally, many identified publications from the literature search focused on the motivation or turnover of IT professionals but not on the actual retention of IT professionals. While motivating IT professionals may keep them happy in their job, the reasons for staying with an organization are much broader than motivation itself. Also, the reasons why employees stay (which is the central question of retention) may be different from the reasons why they leave (the question of turnover) (Mitchell et al., 2001; Coombs, 2009). Therefore, we propose future research should focus more on retention.

Next, we will discuss some limitations of this study. Of the articles studied in the literature analysis 60% had a major scope on the retention of IT professionals. The remaining 40% of the studied articles reviewed employee retention in its more general form. More publications focused specifically on the retention of IT professionals should have been included, but this was not possible since an extensive search was done on the various literature databases and all identified relevant literature was included for the literature analysis.

The in-depth interview sample was relatively small (n=21). The small sample size limits the validity of our inferences. Furthermore, interviews were conducted with young IT professionals with little work experience. These young IT professionals might not have enough experience to know what would actually keep them in an organization, and might thus have different views on what is important for them compared to experienced IT professionals. Also, a convenience sampling was used at only one university. This also limits the inference power of our interview data. Finding a larger sample from a larger population of IT professionals, including those with more work experience, would be recommended for further research. Doing so would provide more reliable results. Furthermore longitudinal research should be done to evaluate changes in retention factors dependent on career stage over time.

We have not done any type of statistical analysis; this makes our results less generalizable. This is partly because our interview sample size is too small for most statistical analysis. Our research is instead explorative and based on a rigorous literature review and serves to gain new insights into retention of IT professionals and to explore new areas for future research.

The open coding of the literature analysis was done by identifying key words and ideas from the analyzed articles. While this gives us a general idea of what has been mentioned in the literature,

it does not accurately describe what factors are more important within one article or across articles. This might give an inaccurate overview of which factors are relatively more important.

We excluded ease of movement as a retention factor because of the specific situation of the current IT job market. The current IT job market shows discrepancy between demand and supply of IT professionals and there are no signs that this discrepancy will improve in the near future. This means that it is easy for the IT professionals to find new jobs. Future research could try to verify if IT professionals indeed perceive no problems in finding a new job (which would mean that ease of movement is not a retention factor for IT professionals), or that ease of movement (despite the high demand and low supply of IT professionals) might in some way still be a retention factor for IT professionals.

Considering possible differences among IT professionals, there are also cultural differences to consider. The majority of authors of the literature in the current sample is dominated by authors working in Western countries; North America (40%), Europe (23%) and Australia (4%). The number of authors working in Eastern countries, namely Asia (12%), is much smaller. It might be interesting to compare, for example, Western and Eastern IT professionals and study differences for retaining IT professionals.

## 5. CONCLUSION

This study analyzes what factors young IT professionals perceive as important to stay effectively working in an organization. Using a rigorous literature and interview analysis, we consider IT professionals' perspective in the current economic climate.

We identified eight salient retention factors: organizational factors, job characteristics, financial compensation, personal development, career advancement, recognition, job security and benefits. Individual characteristics directly influence or moderate other retention factors. For instance, a more introverted IT professional will value social elements less than someone who is extroverted and desires social affiliation (Lee, 2004). Furthermore, we discovered five salient retention factors, which were reported most frequently in both the literature and the interviewees: organizational factors, job characteristics, career advancement, financial compensation and personal development. This suggests that these retention factors are the most important retention factors based on this research in retaining IT professionals.

In light of the financial crisis, we propose that the usual cost saving measures are counterproductive in retaining IT professionals and may lead to turnover of effective employees, leaving the organization with the less productive ones. Organizations should enter into dialogue with effective IT staff and empower them to contribute to the planning of their careers.

Highly effective IT professionals are associated to have 'high' personal growth orientation and are likely to desire fulfillment of higher order needs (Maslow). We propose that retention of such talent can be increased by providing challenging work, opportunities for career advancement, personal development programs and organizational stability and job security.

We used self-determination theory, human capital theory and multiple-constituency approach to provide some contextual embedding and new insights into our research findings. Further, we propose a multiple-constituency approach based model, which includes actors that influence the retention of the IT professional and the retention factors.

The empirical data confirms that financial compensation is important for young IT professionals. Indeed, financial compensation may act as a hygiene factor for IT professionals. This means that although 'high' financial compensation does not automatically motivate IT professionals to stay with an organization, 'low' financial compensation may be a reason to leave.

Organizations need to ensure that the financial compensation fulfills IT professional's basic financial needs. Once this is fulfilled organizations should seek to find a fit between the individual and the organization and job characteristics. We propose that this can be done by developing (in cooperation with the IT professional) personalized career development plans. This plan should include personal development and career advancement opportunities.

Unfortunately, due to the limited sample size, the results are not conclusive. However, by synthesizing the literature on retention of IT professionals and collecting fresh interview data in the current economic climate, we hope to have provided a base for future research on retention of young IT professionals.

## APPENDIX I: Journal overview of selected literature

Journal	Number of articles	Author
Communications of the ACM	8	Klawe et al. (2009)
		McKinney et al. (2008)
		Enns et al. (2006)
		Moore and Love (2005)
		Pawlowski et al. (2005)
		Agarwal and Ferratt (2002)
		Moore and Burke (2002)
		Agarwal and Ferratt (2001)
Information & Management	6	Coombs (2009)
		McKnight et al. (2009)
		Armstrong et al. (2007)
		Lee (2004)
		Hsu et al. (2003)
		Mak and Sockel (2001)
The International Journal of Human Resource Management	5	Blomme, van Rheede Tromp (2010)
		Chasserio and Legault (2009)
		Tanova and Holtom (2008)
		Reiche (2007)
		Hsieh. and Liu (2006)
Academy of Management Journal	3	Felps et al. (2009)
		Mossholder et al. (2005)
		Mitchell et al. (2001)
ACM Computer Personnel Research	3	Allen et al. (2009)
		Paré et al. (2001)
		Agarwal and Ferratt (2000)
Human Resource Management	3	Holtbrügge et al. (2010)
		Hausknecht et al. (2009)
		Niederman et al. (2007)
MIS Quarterly	3	Ahuja et al. (2007)
		Joseph et al. (2007)
		Moore (2000)
Human Resource Management Review	2	Steel and Lounsbury (2009)
		Cardy et al. (2007)
Journal of Management Information Systems	2	Josefek Jr and Kauffman (2003)
		Thatcher et al. (2002)
Journal of Systems and Software	1	Ghapanchi and Aurum (2011)
Management International Review	1	Kwon et al. (2010)
ACM Transactions on Software Engineering and Methodology	1	Hall et al. (2009)
Vocations and Learning	1	Kyndt et al. (2009)
African Journal of Business Management	1	Samuel and Chipunza (2009)
Personnel Review	1	de Vos and Meganck (2009)
Journal of Managerial Psychology	1	D'Amato and Herzfeldt (2008)
Information and Software Technology	1	Beecham et al. (2008)
Journal of Business Ethics	1	Coldwell et al. (2008)
The Academy of Management Annals	1	Holtom et al. (2008)
Journal of Business Research	1	Li (2008)
International Business Review	1	Reiche (2008)
Human Relations	1	Vardaman et al. (2008)
Behaviour & Information Technology	1	Carayon et al. (2006)
Research-Technology Management	1	Rumpel and Medcof (2006)
Information Systems Management	1	Longenecker and Scazzero (2003)
Journal of Management	1	Griffeth et al. (2000)
Accounting, Management and Information Technologies	1	Lee (2000)

## APPENDIX II: Frequency of mention of each retention factor

Retention factor	Description of retention factor	Retention sub-factors and authors mentioning the factor	Frequency of mention*		
			Combined ranking	Authors	Interviewees
Organizational factors	The characteristics of the organization, such as organizational climate and culture and work environment are included in this factor. An organizational climate and culture that fits with the employee increases retention.		161	37 (70%)	21 (91%)
		<u>Work environment</u> Hausknecht et al. (2009), Rumpel and Medcof (2006), Longenecker and Scazzero (2003)	106	16 (30%)	16 (76%)
		<u>Social elements</u> Hausknecht et al. (2009), de Vos and Meganck (2009) Tanova and Holtom (2008), Mossholder et al. (2005), Lee (2004)	78	16 (30%)	10 (48%)
		<u>Organizational climate and culture</u> Felps et al. (2009), Beecham et al. (2008), Agarwal and Ferratt (2002)	63	16 (30%)	7 (33%)
		<u>Organizational image</u> Coombs (2009), Hausknecht et al. (2009)	44	8 (15%)	6 (29%)
		<u>Organizational fairness</u> Hausknecht et al. (2009), Ahuja et al. (2007), Moore and Love (2005)	39	13 (25%)	3 (14%)
		<u>Balance of work/family life</u> de Vos and Meganck (2009), Ahuja et al. (2007), Armstrong et al. (2007)	35	13 (25%)	2 (10%)
Job characteristics	This factor includes the characteristics of the current job, such as job content and autonomy. When these characteristics fit with employee needs and expectations retention is increased.		120	36 (68%)	12 (52%)
		<u>Job content</u> Holtbrügge et al. (2010), McKnight et al. (2009), Samuel and Chipunza (2009), de Vos and Meganck (2009), Pawlowski et al. (2005)	85	22 (42%)	9 (43%)
		<u>Job satisfaction</u> McKnight et al. (2009), Hausknecht et al. (2009), Pawlowski et al. (2005), Thatcher et al. (2002)	59	21 (40%)	4 (19%)
		<u>Autonomy</u> Samuel and Chipunza (2009), McKnight et al. (2009), Pawlowski et al. (2005)	50	21 (40%)	2 (10%)
Career advancement	Career advancement includes not only promotions (upward mobility), but also internal mobility (lateral movement into different departments).		107	19 (36%)	15 (71%)
		<u>Promotions</u> Blomme et al. (2010), Steel and Lounsbury (2009), de Vos and Meganck (2009), Agarwal and Ferratt (2002)	90	10 (19%)	15 (71%)
		<u>Internal mobility</u> Blomme et al. (2010), Ghapanchi and Aurum (2011), Agarwal and Ferratt (2002)	25	6 (11%)	3 (14%)
Financial compensation	The financial compensation for work.		100	23 (43%)	12 (57%)
		<u>Financial compensation</u> Holtbrügge et al. (2010), Steel Hsieh and Liu (2006), Rumpel and Medcof (2006)	100	23 (43%)	12 (57%)
Personal development	Training and learning can be organization-specific, job/skill-specific or general.		69	21 (40%)	6 (29%)
		<u>Learning and training</u> Kyndt et al. (2009), D'Amato and Herzfeldt (2008), Pawlowski et al. (2005), Agarwal and Ferratt (2002), Agarwal and Ferratt (2001)	69	21 (40%)	6 (29%)

\* Authors who mention multiple sub-factors are only counted once.

Retention factor	Description of retention factor	Retention sub-factors and authors mentioning the factor	Frequency of mentioning*		
			Combined ranking	Authors	Interviewees
Recognition	This factor includes recognition received for performance and feedback on performance.		63	16 (30%)	7 (33%)
		<u>Recognition</u> Hall et al. (2009), Samuel and Chipunza (2009), Agarwal and Ferratt (2001)	54	11 (21%)	7 (33%)
		<u>Feedback</u> Ghapanchi and Aurum (2011), Hall et al. (2009)	16	6 (11%)	1 (5%)
Job security	The perceived job security of the current job.		50	11 (21%)	6 (29%)
		<u>Job security</u> Blomme et al. (2010), Agarwal and Ferratt (2002), Mak and Sockel (2001)	50	11 (21%)	6 (29%)
Benefits	This includes indirect financial benefits, such as health and welfare benefits and non-financial benefits such as workplace child care.		30	6 (11%)	4 (19%)
		<u>Benefits</u> Samuel and Chipunza (2009), Cardy et al. (2007)	30	6 (11%)	4 (19%)
Individual characteristics	Individual characteristics vary from person to person, such as organizational commitment, individual characteristics and perceived fit with the job and organization. Some sub-factors like organizational commitment and perceived fit with job and organization will increase retention, while other sub-factors, such as career stage, moderate the relationship with retention factors and the needs of the employee.		168	43 (81%)	20 (87%)
		<u>Personal growth orientation</u> D'Amato and Herzfeldt (2008), Enns et al. (2006)	106	16 (30%)	16 (76%)
		<u>Fit with job and organization</u> Felps et al. (2009), Steel and Lounsbury (2009), Beecham et al. (2008), Coldwell et al. (2008), (Cardy et al. (2007), Joseph et al. (2007), Niederman et al. (2007)	92	16 (30%)	13 (62%)
		<u>Relationship orientation</u> Li (2008), Vardaman et al. (2008), Mossholder et al. (2005)	86	20 (38%)	10 (48%)
		<u>Career stage</u> Steel and Lounsbury (2009), Enns et al. (2006)	46	7 (13%)	7 (33%)
		<u>Organizational commitment</u> Blomme et al. (2010), Kwon et al. (2010), Chasserio and Legault (2009), D'Amato and Herzfeldt (2008), Thatcher et al. (2002), Paré et al. (2001)	38	20 (38%)	-
		<u>Gender</u> Blomme et al. (2010), Tanova and Holtom (2008), Armstrong et al. (2007)	17	9 (17%)	-

\* Authors who mention multiple sub-factors are only counted once.

### APPENDIX III: Illustrative examples for retention (sub-)factor

Retention factor	Retention sub-factor	Quotes from the reviewed retention literature	Quotes from the interview data of this study
Organizational factors	Balance of work/family life	<i>"Inter-role conflict between demands of work and family."</i> (Gutek et al., 1991 in Joseph et al., 2007, p. 551)	<i>"family and work should be balanced."</i>
	Organizational climate and culture	<i>"The blend of ideas, customs, traditional practice, company values and shared meanings that help define normal behavior for everyone who works in a company. Culture is 'the way we do things around here.'"</i> (Post et al., 2002, p. 132 in Coldwell et al., 2008, p. 615)	<i>"working environment... the informal... and friendly environment."</i>
	Organizational fairness	<i>"Perceptions about the fairness of reward allocations, policies and procedures, and interpersonal treatment."</i> (Hausknecht et al., 2009, p. 6)	<i>"so if something [unfair payment] is below standards I would try to discuss it but if there is no willingness I'm gone."</i>
	Organizational image	<i>"The degree to which the organization is perceived to be reputable and well-regarded."</i> (Hausknecht et al., 2009, p. 6)	<i>"[the growth of the company] not only financial, also like the other they expand to more areas or ... I mean the business side... they have more business, more diversity in the business."</i>
	Social elements	<i>"Those forming a greater number of ties with co-workers become more embedded and more likely to identify with those around them (Burt, 2001). Such social grounding dampens the effect of real or perceived shocks that may give rise to turnover."</i> (Mossholder et al., 2005, p. 613)	<i>"...but things that would retain me are the colleagues."</i>
	Work environment	<i>"Appropriate working conditions/ environment/ good equipment/ tools/ physical space/ quiet"</i> (Beecham et al., 2008, p. 868)	<i>"but the working environment is really, really important. No matter how good your salary is, if you don't like the people you work with every...."</i>
Job characteristics	Autonomy	<i>"Autonomy (e.g., freedom to carry out tasks, allowing roles to evolve)."</i> (Beecham et al., 2008 p. 868)	<i>"... flexibility in doing the job."</i>  <i>"And also the independence a little bit that you have a set of things that you can decide for yourself what direction it will go."</i>
	Job content	<i>"Motivated by the nature of the job, e.g., technical success and challenging technical problems."</i> (Beecham et al., 2008, p. 861)	<i>"... I don't want to do the same thing again and again every year."</i>
	Job satisfaction	<i>"Affective attachment to a job"</i> . (Tett and Meyer, 1993 in Joseph et al., 2007, p. 550)	<i>"and if it gives me a sense of pride to work there! For example, if you work with the government you help all of people and you go home... you think well I've done quite nice things today. Then I think it is a job where I'd stay for a long period of time."</i>
Financial compensation	Financial compensation	<i>"The amount of pay, benefits, or equivalents distributed in return for service."</i> (Hausknecht et al., 2009, p. 6)	<i>"... and there is the salary... monetary benefits"</i>  <i>"The financial benefits..."</i>  <i>"A very good pay."</i>
Personal development	Learning and training	<i>"Technical development (BB4) included two items: The opportunity to be trained on new technology, and the opportunity to use new technology."</i> (Coombs, 2009, p. 236)	<i>"You get knowledge and skills with training and stuff..."</i>

Retention factor	Sub-factor	Quotes from the literature	Quotes from interview data
Career advancement	Internal mobility	"... Organizations adopt distinct ILM [internal labor market] strategies for different IT jobs, and that these strategies relate to differential turnover rates." (Ang and Slaughter, 2004, p. 11 in Ghapanchi and Aurum, 2011, p. 243)	"... change my job... make my job more interesting..." (lateral movement)
	Promotions	"Excellent opportunities for advancement and development; This company offers me the chance to move up; I see the potential and I see a future here; I started a year ago and was promoted a lot within a year and I love that; I like the opportunity to grow; They hire and promote talent instead of seniority; The chance of upward mobility." (Hausknecht, 2009, p. 21)	"... there should be opportunity or chances for people to change their job or their position"
Recognition	Feedback	"Job feedback positively influences individual's feelings of competence and enjoyment of the task [therefore it negatively impacts employee turnover]" (Thatcher et al., 2006, p. 135 in Ghapanchi and Aurum, 2011, p. 243)	"...or if I do something wrong they will not say, 'Hey, you did something wrong' or punish me, or something like that but 'How can we learn?' and something like that."
	Recognition	"Recognition (for a high quality, good job done based on objective criteria)" (Beecham et al., 2008, p. 868)	"By happy I mean my work is recognized, I get to do... or contribute to the company and it finds my contribution valuable."
Job security	Job security	"Permanent, steady work." (Pawlowski et al., 2005, p. 90)	"I'd prefer a solid job, just to pay the regular bills."
Benefits	Benefits	"An array of benefits including day care for over 200 children at the headquarters site, free access to a 36,000 square-foot gym, a putting green, sky-lit meditation rooms, a full-time elder-care consultant, a pianist in the company café, and all the free juice and soda employees want." (Fortune, 2002 in Cardy et al., 2007, p.143)	"A good cafeteria and it is clean and safe and also healthy..." "Benefits like social benefits... insurance for their employees. So those kinds of benefits also for instance health facilities." "One thing I really like there... since they do a lot of sponsorships, sports- related sponsorships. They let me follow a speed-skating clinic, by professional skaters." "...maybe I would get a car... so benefits were good."

<b>Retention factor</b>	<b>Sub-factor</b>	<b>Quotes from the literature</b>	<b>Quotes from interview data</b>
Individual characteristics	Career stage	<i>"Career stage (age and experience, e.g., apprentice, colleague, mentor, sponsor)." (Beecham et al., 2008, p. 868)</i>	<i>"So it is also connected to your lifecycle phase. Let's say if I'm planning a family, then I would assume that I would like to have a job where I can have some extra time for my kids in the first year. So then it would become really important that flexible times would be one of things I value. But if I don't plan on having kids then I don't care and I'd make sure I have more benefits in the near future."</i>
	Fit with job and organization	<i>"Fit with the organization assesses how the individual perceives their work in the organization and whether the individual feels that there is congruence between what he/she wants to do or can do and what he/she is actually doing." (Tanova and Holtom, 2008, p. 1555)</i>	<i>"I'm thinking about the fit between the company values and personal values..."</i>
	Gender	<i>"Individual demographic attributes that can impact IT turnover such as age, gender, education and organizational tenure." (Ghapanchi and Aurum, 2011, p. 239)</i>	(no quotes available)
	Organizational commitment	<i>"The degree to which individuals identify with and are involved in the organization." (Hausknecht et al., 2009, p. 6)</i>	(no quotes available)
	Personal growth orientation	<i>"Individuals with strong achievement needs tend to constantly challenge themselves and then need feedback on their achievements. Such individuals will find security and financial compensation less motivating than, say, responsibilities and feedback." (Hall et al., 2009, p. 10:7)</i>	<i>"...growth possibilities in an organization" "Growth... well it's with knowledge and skills."</i>
	Relationship orientation	<i>"Taking a social network perspective, McPherson, Popielarz, and Drobnic (1992) found that individuals with more ties within an organization's social network were less likely to turn over." Holtom et al., 2008, p. 242)</i>	<i>"Things that would keep me would be things like colleagues." "The things that would retain me are the colleagues."</i>

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