Career transition antecedents in the information technology area

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Abstract. *The more organizations invest in information technology (IT), the more the concern with IT personnel management has increased, namely the hiring, training and retaining of IT professionals needed to deal with such investments. In this context, two issues related to these professionals have often been observed, namely 'turnover' – in which the IT professional changes job but still remains in the IT area – and 'turnaway' – in which the IT professional abandons the IT area and assumes a job in another area in the same organization or another, usually rising to a managerial position. This work addresses the turnaway of IT professionals in Brazil. The relevance of this research is supported by the shortage of adequately trained IT professionals to work in the productive sector in this country. Therefore, by using and adapting the extant scientific literature, research hypotheses associated with the IT professional turnaway phenomenon are developed and tested via structural equation modelling. It was then concluded that exhaustion with work in the IT area, job dissatisfaction, the need to acquire further experience to remain attractive in the job market, the need for professional growth and prior and conscious managerial capacity development for career transition are the main antecedents of the career transition of IT professionals to other functional areas.*

Keywords: information technology, IT professional, turnaway, career transition, Brazil

INTRODUCTION

The more organizations invest in information technology (IT) and this technology influences their business processes increasingly (Kretschmer, 2012), the more IT professionals are needed and, thus, the more the concern with IT personnel management has increased, namely the hiring, training and retaining of these professionals. Therefore, according to Barton & Martin (1982) and Lounsbury *et al.* (2007), human resource management is the critical variable in IT management. Moreover, because of the inherent dynamics of the IT area, organizations have had difficulty in motivating and retaining their IT professionals, as well as attaining the desired

IT business alignment (Tallon & Pinsonneault, 2011). Besides, IT professionals have had difficulty remaining motivated and responding to the intense challenges they face to acquire the latest technical and managerial skills (Loogma *et al.* 2004; Joseph *et al.* 2011; Vreuls & Joia 2012).

In this context, two issues related to these professionals have often been observed, namely 'turnover' – in which the IT professional changes job but still remains in the IT area – and 'turnaway' – in which the IT professional abandons the IT area and assumes a job in another area in the same organization or another, usually rising to a managerial position (Joseph & Ang, 2001; Joseph *et al.* 2012; Schropshire & Kadlec, 2012).

This work addresses the turnaway of IT professionals in Brazil. The relevance of this research is supported by a shortage of adequately trained IT professionals to work in the productive sector in this country, this being a hurdle to be overcome by a developing country in order to be included in the current knowledge society (Avgerou, 2008). According to Brasscom – The Brazilian Association of Information and Communication Technology Organizations – in 2014, there was a shortage of more than 45 000 IT professionals in Brazil, as nearly 78 000 new IT professionals were needed in Brazil but less than 33 000 professionals finished their IT undergraduate courses in that year.[1] Besides, according to Brasscom, in order to revert this scenario, it is paramount to retain the students in their IT undergraduate courses, as the average academic dropout rate from these courses was nearly 87% in 2010 in Brazil[1].

Furthermore, The Brazilian Association of Software Companies announced in March 2013 that the shortage of specialised workforce is one of the major challenges in the Brazilian IT market.[2] According to IDC, the growth of infrastructure and technology companies in Brazil, the increasing adoption of IT services by all types of organizations and the fact that important events were scheduled to take place in Brazil, such as the Soccer World Cup in 2014 and the Olympic Games in 2016, are some of the reasons that might explain the deficit of IT professionals in the market.[3] However, those sources of reference did not take into consideration the turnaway phenomenon, which increases the shortage of qualified IT workforce in Brazil even more.

Thus, one might infer that the turnaway phenomenon is not being adequately measured in the country and has not been perceived by the Brazilian government (Mangia, 2013), which further corroborates the importance of research that investigates the antecedents of this phenomenon.

For the first time in Brazil, Ramos & Joia (2013) analysed the IT professional turnaway phenomenon by investigating this issue in two organizations. Ramos & Joia (2013) proposed six hypotheses from the extant literature and tested them using positivist multiple case study methodology addressing these two organizations. Yet, this study intends to go beyond the aforementioned paper's findings by broadening the theoretical background and proposing more hypotheses, in order to test all of them using a multivariate statistical approach, as presented later in this work. Ramos & Joia's (2013) paper and this paper belong to the same research

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[1]See http://www.brasscom.org.br/brasscom/Portugues/detInstitucional.php?codArea=3&codCategoria=48, accessed on 12/15/2014.
[2]See http://bit.ly/1c3hiIl, accessed on 03/23/2014
[3]See http://abr.ai/10cKQI2, accessed on 03/23/2014

stream funded by the National Research and Development Council of the Brazilian Ministry of Science of Technology. Whereas the former involves preliminary case study research, the latter develops a structural model, scales for the factors accrued from the extant literature, measurement items, new hypotheses and so forth, as traditionally happens when a new knowledge field is addressed. In fact, according to Christensen & Carlile (2009), the creation of a new body of knowledge occurs in two stages: first, there is a descriptive or inductive stage where researchers observe phenomena and describe and measure what they see (as in Ramos & Joia (2013)). Based on these observations, in the second stage researchers develop constructs that represent the essence of what has been observed and identify relationships between them. Thereafter, researchers develop models which organise the aspects of the problem they study and, in a deductive way, test the models and support or fail to support the hypotheses developed (as in this article). Therefore, based on the information in the preceding texts, this study seeks to address the following research question: 'What are the antecedents of IT professional career transition to other functional areas in Brazil?'

This work is structured as follows: after this introduction, in the next section, the literature review used in this study is addressed and the research hypotheses are developed and presented therefrom. The methodological procedures followed in this article are then set forth. After that, the results obtained are presented and then these aforementioned results are discussed, the implications accrued from this study are described and the limitations of this research are outlined. Lastly, some concluding remarks close the article.

THEORETICAL REFERENCES AND RESEARCH HYPOTHESES

In the knowledge area in which this paper's research problem is embedded – IT professional career management – there are literature and theory that have been developed since the 1980s (Barton & Martin, 1982; Chesebrough & Davis, 1983; Kaiser, 1983; Turner & Baroudi, 1986; Igbaria *et al.* 1991; Ang & Slaughter, 2000; Moore *et al.* 2001; Lee, 2002; Darais *et al.* 2004; Sumner *et al.* 2005; Joseph *et al.* 2007; Lounsbury *et al.* 2007; Mithas & Krishnan, 2008; Joseph *et al.* 2011), However, most of this literature addresses the IT professionals' turnover phenomenon, namely their transition to other IT areas of other organizations (e.g., Turner & Baroudi, 1986; Reich & Kaarst-Brown, 1999, 2003; Nelson *et al.* 2001; Brown, 2006; Joseph *et al.* 2007; Ituma & Simpson, 2009; Joseph *et al.* 2011, 2012). With respect to the IT professionals' turnaway phenomenon, namely their transition to other functional areas in the same organization or another, the situation is more complex, as the problem is neither well understood nor properly investigated in the IT literature (Ang & Slaughter, 2000; Nelson *et al.* 2001). Indeed, few recent works about this issue can be found in the scientific literature (e.g. Mithas & Krishnan, 2008; Joseph *et al.* 2012; Schropshire & Kadlec, 2012), there being only one article (Ramos & Joia, 2011) and a master thesis (Mangia, 2013) already published in Brazil in Theoretical References and Research HypothesesPortuguese addressing this issue.

Therefore, in the next section, the extant theoretical background related to the IT professional and the career transition of same will be examined. Throughout this analysis, several research hypotheses are formulated to be tested according to the methodological procedures set forth in this

article. In order to survey the extant literature on the IT professional career transition, articles in several academic databases were located with the use of keywords, such as IT professional career transition, IT professional, turnaway of IT professionals, turnover of IT professionals, IT human capital and IT personnel. The articles found were then analysed and consolidated through a protocol, in order to be used in the development of this article where appropriate.

The IT professional

Over the past few decades, the importance of IT in companies has increased exponentially (Tallon & Pinsonneault, 2011), which has led to the need for more specialised IT professionals performing ever more complex tasks (Loogma *et al.* 2004). Moreover, the IT professional is now obliged to interact with colleagues other than those in the IT department, who often have different expectations and cultures to those of the IT professional (Tsai *et al.* 2007). Thus, according to Huarng (2001) and Vreuls & Joia (2012), IT professionals are being subjected to greater workloads and emotional stress.

Furthermore, Loogma *et al.* (2004) identified that organizations tend to require greater flexibility, knowledge, mobility, capacity of dealing with changes of employees, work environments, timetables, tasks, locations and skills to solve problems and generate creative thinking from IT professionals. These demands tally with a young and independent professional profile, often being incompatible with a pre-established personal life and family structure of professionals who have been in the IT arena for a long time.

In line with this, Anell & Wilson (2000) and Sverke & Hellgreen (2002) observed, however, that no matter how flexible professionals are, they need to find a minimum level of stability that allows them to cope psychologically with a very fluid job. This sensation of stability can be attained by being attuned to the work, by mastering a knowledge field or by maintaining an on-going relationship with teammates. However, observing the current context of IT professionals, one can see how difficult it is for these professionals to attain the necessary psychological stability. Loogma *et al.* (2004) also support that because of continuous breakthroughs in the IT realm, IT professionals experience anxiety as it is almost impossible to forecast the future of this area and, consequently, their own professional future and the skills they need to develop.

Furthermore, Hoffman (2003) argues that IT professionals would prefer to be involved in the managerial aspects of IT projects rather than merely playing technical roles. This might explain their quest for executive courses addressing business administration and project management. However, IT professionals can face hurdles to move to another functional area, as organizations tend to give preference to professionals with expertise and experience in this functional area (Moreno *et al.* 2009).

Although Schambach (1999) argues that mature IT professionals are no longer motivated to keep their skills updated – a trend that might be related to pessimism regarding receiving just rewards, be they functional, hierarchical, social or financial – Tsai *et al.* (2007) and Moreno *et al.* (2009) argue that some IT professionals, whatever their age, perceive the need to remain updated as an opportunity to satisfy their interest in novelties and breakthroughs that emerge in the IT realm. Thus, the ongoing evolution of IT might be a critical factor for keeping IT professionals motivated and retaining them in the area (Moreno *et al.* 2009; Joseph *et al.*, 2011).

Lastly, the IT professional setting in Brazil is quite peculiar as, according to frameworks developed by Freidson (1984) and Abbott (1988), the IT career in the country is perceived as an occupation rather than a profession. This might lead IT professionals in Brazil and even worldwide to suffer from an identity crisis as already noticed by Benbasat & Zmud (2003) and Moura Jr. & Helal (2014) and to move to another functional area.

IT professional career transition and research hypotheses

In order to better understand the shortage of IT professionals because of turnaway to another functional area, in this section a literature review on career transition was conducted by the authors in order to identify and cluster possible antecedents for IT professional turnaway to other functional areas. Research hypotheses are then developed, as well as an exploratory conceptual model, to be further tested in this article in accordance with the methodological procedures set forth later.

First of all, according to Clayton *et al.* (2012), Downey (2012) and Joseph *et al.* (2012), the need for professional growth (PG) might be one of the factors that leads the IT professional to change jobs, as the scientific literature has supported that there is little room to grow in the technical arena. This leads IT professionals to move either to other organizations in which technical growth is still possible or to other functional areas within the same organization in which PG is more likely than in the IT area (Turner & Baroudi, 1986; Katz & Allen, 1997; Lee *et al.* (1997); Karahanna & Watson, 2006; Ramos & Joia, 2011, 2013; Mangia, 2013). Thus, this leads to hypothesis H1 presented in the succeeding texts:

  H1: IT professionals who pursue PG intend to turn away from the IT area to another area.

Moreover, Zabusky & Barley (1996), Lee *et al.* (1997), Reich & Kaarst-Brown (1999) and Ramos & Joia (2011, 2013) have realised that the IT professionals who move from the IT area to another area within the same company are those who are more committed to their companies than to an IT career. These findings were also supported by Joseph & Ang (2001), who detected a greater incidence of turnover than turnaway in IT professionals with a strong commitment to the IT area. Based on this, hypothesis H2 can be formulated:

  H2: IT professionals who are more committed to their companies than to the IT knowledge field intend to turn away from the IT area to another area.

In the same vein, Lee *et al.* (1997) and Ituma & Simpson (2009) go further in this issue supporting that the way IT professionals perceive professional success explains their career trajectories. Indeed, individuals envisage professional success as well as their career trajectories from two paradigms (Lee *et al.* 1997; Lee, 2002; Ng & Feldman, 2007; Greenhaus *et al.* 2008). In accordance with the career accomplishment paradigm, usually associated with technical functions, success accrues from the recognition within a closed community with a weak hierarchical structure, which is almost unintelligible to people who do not belong to it. Conversely, in accordance with the career advancement paradigm, success accrues from higher

positions achieved by professionals, as well as their ascent within the power structure of their companies (Zabusky & Barley, 1996; Feldman & Ng, 2007; Greenhaus *et al.* 2008). Zabusky & Barley (1996) and Lee *et al.* (1997) contend that professionals who are driven by the career accomplishment paradigm are less likely to abandon the IT area than those driven by the career advancement paradigm. Thus, one can develop hypothesis H3:

H3: IT professionals who are motivated by the career advancement paradigm rather than the career accomplishment paradigm intend to turn away from the IT area to another area.

In turn, the scientific literature also reveals that IT professionals who move from a functional area to another area are manifestly dissatisfied with their careers (e.g. Stevens, 1992; McLean *et al.* 1996; Joseph & Ang, 2001; Sumner & Yager, 2004; Ng & Feldman, 2007; Ramos & Joia, 2011, 2013). According to the extant literature, this dissatisfaction is manifold and may be associated with several reasons such as family–work conflict (Adams *et al.* 1996; Messersmith, 2007; Dinger, Tatcher & Stepina, 2010), exhaustion with the job (Moore, 2000; Schropshire & Kadlec, 2012: Mangia, 2013); heavy perceived workload (PW) (Moore, 2000; Mangia, 2013) and job dissatisfaction (JD) (Carayon *et al.* 2006; Mangia, 2013), namely the perception that the job is not fulfilling or not enabling the professional to attain desired job satisfaction (Locke, 1976).

Thus, based on the aforementioned references and in order to better understand the IT professional turnaway phenomenon, four hypotheses are proposed to be further tested, as described in the succeeding texts:

H4: IT professionals who are experiencing conflicts related to family vs. work intend to turn away from the IT area to another area.

H5: IT professionals who are experiencing exhaustion related to their work intend to turn away from the IT area to another area.

H6: IT professionals who are experiencing a PW intend to turn away from the IT area to another area.

H7: IT professionals who are dissatisfied with their jobs in the IT area intend to turn away from the IT area to another area.

In turn, career mobility is a recent phenomenon and the extant literature has argued that professionals should be prepared to switch to other functional areas throughout their professional lives (Stevens, 1992; Mainiero & Sullivan, 2005; Mangia, 2013). Confirming this concept, most MBA students in the USA in 2009 took advantage of the course to move to another industry or function Graduate Management Admission Council (2009) and websites about careers recommend preparation for career change, stressing the importance of networking to achieve this (Niznik, 2012). Moreover, the literature about career mobility supports that professionals change their careers to learn new skills and obtain new experiences (NE) in order to become employable in a professional context driven by companies that have experienced repeated and ongoing reorganizations that have often led to dismissals (Martins, 2001; Brown, 2006; Ramos & Joia, 2011, 2013;

Mangia, 2013). Besides, according to Joseph *et al.* (2012), the skill sets that facilitate IT professional turnaway to another functional area are more likely to be non-IT rather than IT related.

Thus, based on the aforementioned arguments, hypotheses H8 and H9 can be formulated:

H8: IT professionals who want to acquire non-IT related skill sets via NE to improve their chances in the job market intend to turn away from the IT area to another area.

H9: IT professionals who seek to develop non-IT related managerial skills via executive education courses intend to turn away from the IT area to another area.

In addition to this, Kanfer & Ackerman (2004) support that the attractiveness of higher levels of effort declines with age, which is an indication that the turnaway phenomenon depends on the professionals' age as the IT area requires constant updating throughout a professional's lifetime. Ramos & Joia (2011, 2013) go further and argue that IT professional career transition may be associated with a mid-life crisis, as well as the IT field in which the IT professional works, namely development, infrastructure and support. Therefore, hypotheses H10 and H11 can be developed:

H10: IT professionals' age is related to their intention to turn away from the IT area to another area.

H11: The IT field, in which IT professionals work (development, infrastructure, support, etc.), is related to their intention to turn away from the IT area to another area.

Lastly, Weisberg & Kirschenbaum (1993) point to the importance gender might have as an antecedent to professional career transition, an argument also supported by Stewart *et al.* (2007) and Clayton *et al.* (2012). This leads to the formulation of hypothesis H12:

H12: IT professionals' gender is associated with their intention to turn away from the IT area to another area.

Figure 1 consolidates the research hypotheses, their associated constructs and the theoretical references that support them.

Then, by using the aforementioned hypotheses, a model is generated in order to depict the antecedents of the turnaway intention (TI) of IT professionals accrued from the extant literature (Figure 2).

In the next section, the methodological procedures followed to test this model are set forth.

METHODOLOGICAL PROCEDURES

This research applied a survey to collect data from IT professionals and then a multivariate statistical technique to analyse the data and test the aforementioned hypotheses. Therefore, the methodological procedures followed in this work are presented in the succeeding texts.

HYPOTHESES	CONSTRUCTS	REFERENCES
H1: IT professionals who pursue professional growth intend to turn away from the IT area to another area.	PROFESSIONAL GROWTH	Turner and Baroudi(1986); Katz and Allen(1997); Lee et al. (1997); Karahanna and Watson (2006); Ramos and Joia, (2011, 2013); Mangia (2013)
H2: IT professionals who identify more with their companies than to the IT knowledge field intend to turn away from the IT area to another area.	COMPANY AFFILIATION	Zabusky and Barley (1996); Lee et al. (1997); Reich and Kaarst-Brown (1999); Ramos and Joia (2011, 2013)
H3: IT professionals who are motivated by the career advancement paradigm rather than the career accomplishment paradigm intend to turn away from the IT area to another area.	CAREER PARADIGM	Lee et al. (1997); Ituma and Simpson (2009)
H4: IT professionals who are experiencing conflicts related to family vs. work intend to turn away from the IT area to another area.	WORK-FAMILY CONFLICT	Adams et al. (1996); Messersmith (2007); Dinger et al.(2010)
H5: IT professionals who are experiencing exhaustion related to their work intend to turn away from the IT area to another area.	WORK EXHAUSTION	Moore (2000); Shropshire and Kadlec, (2012): Mangia (2013)
H6: IT professionals who are experiencing a heavy perceived workload intend to turn away from the IT area to another area.	HEAVY PERCEIVED WORKLOAD	Moore (2000); Mangia (2013)
H7: IT professionals who are dissatisfied with their jobs in the IT area intend to turn away from the IT area to another area.	JOB DISSATISFACTION	Carayon et al. (2006); Mangia(2013)
H8: IT professionals who want to acquire non-IT related skill sets to improve their chances in the job market intend to turn away from the IT area to another area.	NEW EXPERIENCES	Martins (2001); Brown (2006); Ramos and Joia (2011, 2013); Mangia (2013)
H9: IT professionals who seek to develop non-IT related managerial skills via executive education courses intend to turn away from the IT area to another area.	MANAGERIAL CAPACITY DEVELOPMENT	Stevens (1992); Mainieiro and Sullivan, (2005); Mangia (2013)
H10: IT professionals' age is related to their intention to turn away from the IT area to another area.	AGE	Kanfer and Ackerman (2004); Ramos and Joia (2011, 2013)
H11: The IT field in which IT professionals work (development, infrastructure, support, etc.) is related to their intention to turn away from the IT area to another area.	IT FIELD	Ramos and Joia (2011, 2013)
H12: IT professionals' gender is associated with their intention to turn away from the IT area to another area.	GENDER	Weisberg and Kirschenbaum (1993); Stewart et al. (2007); Clayton et al. (2012).

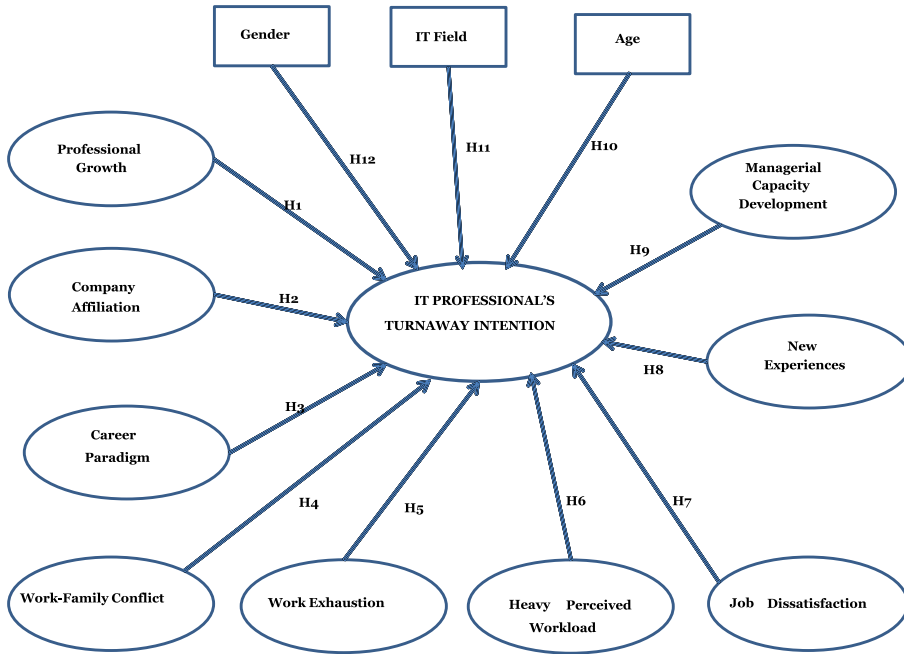**Figure 1.** Research hypotheses, constructs and references.

Figure 2. Structural model and research hypotheses.

Sample and data collection

A questionnaire based on a five-point Likert scale was drawn up in order to obtain the view of IT professionals about their careers, as recommended by Gil (2002). The target population of this research was made up of IT professionals from different companies and industries in Brazil. Therefore, a secondary data set was used that was accrued from CAGED (General Records of Employees) and RAIS (Annual Report of Social Information), both issued by the Brazilian Ministry of Labor (MTE). This data set contains records of all IT professionals currently and officially working in Brazil, being comprised of nearly 1.3 million professionals with their respective emails. Hence, following the recommendations of Pedhazur & Schmelkin (1991) and Malhotra (2001), random selection was applied and 3000 professionals were selected to be contacted via email by the authors. In this email, there was an invitation for the IT professionals to take part in this research with a link to the questionnaire to be filled out by them. The survey was then made available for these professionals on the Web for 70 days (from 09/26/2013 to 12/05/2013).

The initial sample of this study comprised 375 IT professionals, namely the ones that accepted the invitation made by email and answered the survey. However, 52 of them did not fill out the survey fully, resulting in an actual sample of 323 IT professionals. A statistical proportion test was then applied on the sample in order to verify whether it might be used as a proxy of the whole IT professional population, as recommended by Pedhazur & Schmelkin (1991).

Measurement instruments

The items of the questionnaire were accrued from scales already validated and used previously in studies presented in the succeeding texts. However, some items of these scales had to be adapted in order to reflect the research subject of this work, as described in the succeeding texts.

Professional growth (PG)

As according to several authors, such as Turner & Baroudi (1986), Katz & Allen (1997), Lee *et al.* (1997), Karahanna & Watson (2006), Ramos & Joia (2011, 2013) and Mangia (2013), PG can lead professionals to move to another area, this factor was measured through seven items of the Career Advancement scale, as presented in the study of Nixon (1985) about Afro-descendant managers' career advancement in organizations. The scale was then adapted in this study to include the IT area in the questions, in order to reflect the research subject (Figure 3).

Company affiliation (CA)

Company affiliation is an important field of research because there is a relationship between same and employees' commitment to the organization (Tompkins, 2005). This creates positive outcomes for work attitudes and behaviours including motivation, job performance and satisfaction, individual decision making and employee interaction and retention (Cheney, 1983; Scott *et al.* 1998). However, this is a very complex and manifold construct, as according to Edwards & Peccei (2007) this factor includes (a) the categorization of the self as an organizational member, (b) the integration of the organization's goals and values and (c) the development of an emotional attachment, sense of belonging and being a part of the organization. Therefore, an attempt was made to measure this factor by using four indicators of the Organizational Affective Commitment scale (CA001–CA004) developed by Meyer & Allen (1991) (Figure 4).

Indicator Code in the Data Set	Indicators
PG001	My growth opportunities within the IT area are limited in some way.
PG002	I have being transferred or laterally promoted in my work, which has broadened my knowledge associated with the IT area (Reverse).
PG003	I have had little or no change in professional growth in my current job within the IT area.
PG004	My career movements within the IT area have been limited to low positions.
PG005	There is no limit for promotion for me within the IT area of my company. (Reverse)
PG006	I consider there are good promotion opportunities within the IT area for me. (Reverse)
PG007	I believe that if I wish I might have a managerial position within the IT area of my company (Reverse).

Figure 3. Indicators of the professional growth factor.

Indicator Code in the Data Set	Indicators
CA001	I would be happy to spend the rest of my career in this company.
CA002	I like to talk about my company to other people.
CA003	This company is very important to me.
CA004	I don't feel a high sense of commitment to this company. (Reverse)

Figure 4. Indicators of the company affiliation factor.

Career paradigm (CP)

This factor was measured by means of three items accrued from the work of Ramos & Joia (2011, 2013) (Figure 5).

Work–family conflict (WF)

In order to assess this construct, it was measured through five items of the WF scale developed by Adams *et al.* (1996), who identified a relationship between WF and the dissatisfaction level of employees with their job (Figure 6).

Work exhaustion (WE)

This construct was measured via four items of the WE scale developed by Moore (2000), who in his study points out that WE impacts work satisfaction in a negative way, which in turn influences employees in their turnover intention (Moore, 2000) (Figure 7).

Heavy perceived workload (PW)

This construct was measured by means of four items of the perceived work overload scale developed by Moore (2000), who in his study identified that a heavy workload perception impacts job satisfaction in a negative way, which in turn influences employees in their turnover intention (Moore, 2000) (Figure 8).

Indicator Code in the Data Set	Indicators
CP001	To be promoted within my organization is more important than to have my work acknowledged by my peers and other colleagues in the IT area.
CP002	To grow hierarchically in my organization is the most important thing for me.
CP003	To have more power in my organization is more important than to have my work acknowledged by my peers and other colleagues in the IT area.

Figure 5. Indicators of the career paradigm factor.

Indicator Code in the Data Set	Indicators
WF001	The demands of my job interfere in my home and family/personal life.
WF002	It is difficult to accomplish my family duties due to the hour load demanded by my work.
WF003	I am unable to perform my tasks at home due to demands imposed by my job.
WF004	The stress accrued from my job makes it difficult for me to accomplish my family/personal duties.
WF005	I used to change my family/personal plans due to duties associated with my job.

Figure 6. Indicators of the work–family conflict factor.

Indicator Code in the Data Set	Indicators
WE001	I feel emotionally exhausted due to my job.
WE002	I feel I'm being used at the end of a working day.
WE003	I feel tired when I wake up in the morning to face another working day.
WE004	I feel exhausted with my work.

Figure 7. Indicators of the work exhaustion factor.

Indicator Code in the Data Set	Indicators
PW001	I feel that the amount of demands, problems or complaints I have to deal with in my job is more than should be expected.
PW002	I feel that the amount of work I have to do impacts the way I perform it.
PW003	I feel busy or in a great hurry.
PW004	I feel under pressure.

Figure 8. Indicators of the high perceived workload factor.

Job dissatisfaction (JD)

This factor was measured by means of five items of the job satisfaction scale developed by Sohi, Smith and Ford (*apud* Bruner II, 2009, p.1505). This scale was used to measure the job satisfaction level of salespersons. Thus, it was adapted by including the IT area in the questions in order to address the subject of this research, namely work in the IT area (Figure 9).

New experiences (NE)

This construct was measured by means of three items accrued from the study of Ramos & Joia (2011, 2013) (Figure 10).

Managerial capacity development (MC)

This factor was measured by means of three items accrued from the study of Ramos & Joia (2011, 2013) (Figure 11).

Indicator Code in the Data Set	Indicators
JD001	I feel that the amount of demands, problems or complaints I have to deal with in my job is more than should be expected.
JD002	I consider my work worth doing. (Reverse)
JD003	My work in the IT area is challenging. (Reverse)
JD004	My work in the IT area is quite interesting. (Reverse)
JD005	My work in the IT area gives me a sense of accomplishment. (Reverse)

Figure 9. Indicators of the job dissatisfaction factor.

Indicator Code in the Data Set	Indicators
NE001	I believe that having new experiences in other areas rather than in IT will give me better employment opportunities in the job market.
NE002	Professionals who build their career in just one company are less attractive to the job market than those who have acquired experience in different companies.
NE003	While being satisfied with the IT area, I think I should pursue new experiences in other areas.

Figure 10. Indicators of the new experiences factor.

Indicator Code in the Data Set	Indicators
MC001	By means of executive education courses (MBA, Executive MBA, etc.), I will have the skill set to leave the IT area.
MC002	I believe that the more contacts and networking I have, the better my chances to leave the IT area will be.
MC003	I believe that the more I plan my career, the better my chances to leave the IT area will be.

Figure 11. Indicators of the managerial capacity development factor.

Turnaway intention (TI)

The IT professional's TI to move to another functional area was measured by means of five items of the scale developed by Genesan and Weitz (*apud* Bruner II, 2009, p.1619), used to assess the turn-over intention of customers in the retailing industry. Therefore, this scale was adapted in this work by replacing the word 'organization' by 'IT area' (Figure 12).

Besides these variables of interest, five control variables were used to test the model, four of which are qualitative (position in the IT area, IT field, educational level and size of the company) and the remaining one is quantitative, namely years of experience in IT. The qualitative variables were represented in the model as dummy variables.

Structural equation model

Data were analysed via structural equation modelling (SEM), which is a multivariate statistical technique that blends factor analysis and multiple regression to estimate the parameters of a structural model. The main objective of SEM is to explain the pattern of a set of simultaneous interdependent relationships among the latent variables measured via observable variables or indicators (Reisinger & Turner 1999). Thus, this work used the WarpPLS 3.0 software – a tool that enables estimating structural equation models based on variance (PLS - *Variance Based View*) – following the recommendations of Kock (2012).

First, the proposed constructs were measured. The analysed factors were then extracted via the principal component method, as well as rotated by means of PROMAX rotation – an oblique rotation that takes into account the existing correlation among the extracted constructs (Kock, 2012). Based on the results accrued from the extracted factors, the convergent and discriminant validities of the measurement tool were evaluated, as well as its reliability. In the second stage, the existence of multicollinearity and outliers in the estimated parameters was investigated, in order to ensure higher reliability in the analyses of the parameters estimated via PLS, and consequently, the test of hypotheses. Lastly, the hypotheses were tested via analysis of the estimated betas and their respective *p*-values, which were obtained by using the bootstrapping technique with a random resampling of 100. In order to obtain these estimates, the WarpPLS 3.0 software performed the PLS regression algorithm, as suggested by Kock (2012).

RESULTS

Descriptive statistics

As stated earlier, the initial sample comprised 375 IT professionals. However, 52 of them did not fill out the questionnaire fully, thereby resulting in a final sample of 323 IT professionals.

Indicator Code in the Data Set	Indicators
TI001	I don't think I will spend my entire career in the IT area.
TI002	I intend to leave the IT area soon.
TI003	I have already decided to leave the IT area.
TI004	Currently, I am looking for a job outside the IT area.
TI005	If I am not promoted soon, I will look for a job outside the IT area.

Figure 12. Indicators of the turnaway intention factor.

Of these respondents, 82.4% (or 266 individuals) were male respondents. This result seems to be compatible with an area dominated by men, as supported by Quesenberry & Trauth (2012), Trauth *et al.* (2012) and Clayton *et al.* (2012). Furthermore, the average age of the respondents was 39.1 years old with an average experience in the IT area of 16.7 years. Moreover, in accordance with Table 1, most of the respondents were at postgraduate level (67.5% of the sample), working mainly in the project management or IT management fields (49.5% in total). Notwithstanding the emphasis on these IT fields, respondents' positions were evenly distributed within the IT area (nearly 25% of the sample), the exception being CIOs/Directors who comprise a mere 4.3% of the sample. Finally, most of the respondents work in large companies (73.1% of the sample).

Table 1. Descriptive statistics of the collected sample

Qualitative variable	Categories	N	% of total
Gender	Male	266	82.4
	Female	57	17.6
Age	Less than 25 years old	7	2.2
	26–35 years old	116	35.9
	36–45 years old	126	39.0
	46–55 years old	64	19.8
	56–65 years old	10	3.1
	Total	323	100.00
Educational level	Technical/undergraduate	73	22.6
	MBA[†]	218	67.5
	Master degree	32	9,.9
	Total	323	100,.0
IT Field	Development	48	14.9
	Infrastructure	36	11.1
	Support	15	4.6
	Implementation	36	11.1
	Project management	86	26.6
	Data base Administration	4	1.2
	Governance	24	7.4
	IT management	74	22.9
	Total	323	100.0
Position in the IT area	Technical/programmer/analyst[‡]	68	21.1
	Consultant/specialist	73	22.6
	Supervisor/coordinator	80	24.8
	Manager/superintendent	88	27.2
	Director/CIO	14	4.3
	Total	323	100.0
Size of the company	Small (less than 99 employees)	27	8.4
	Medium (100 to 499 employees)	60	18.6
	Large (more than 500 employees)	236	73.1
	Total	323	100.0

[†]In Brazil, an MBA leads to a post-graduated level (diploma).
[‡]Professionals without an undergraduate degree.

As already stated in the methodological procedures, a proportion test was conducted to verify whether the random sample might represent the whole population according to an adequate level of significance. Thus, the sample and population proportions of the qualitative variables in Table 1 were compared by using the statistical proportion test, as recommended by Pedhazur & Schmelkin (1991). The errors obtained in this test for all variables were below 5% (p-value < 0.0001), allowing the sample to be analysed quantitatively as presented in the succeeding texts.

Measurement instruments tests

First, it is necessary to assess the convergent and discriminant validities, as well as the reliability of each construct.

The convergent validity of each construct was evaluated by calculating the factor loadings, as proposed by Kock (2012). Hair *et al.* (2005) argue that for a factor to have an acceptable convergent validity, the p-values associated with the factor loadings must be lower than 5% level of significance and the loadings must be higher than or equal to 0.5. Based on these criteria, the indicator CP002 was discarded from the analysis. Thus, a new measurement model was estimated after the exclusion of the aforementioned indicator, thereby leading to an acceptable convergent validity of the constructs.

The correlation matrix among the latent variables was used to assess the discriminant validity of the measurement, as recommended by Kock (2012). The usual criterion to evaluate discriminant validity is to compare the square root of the average variance extracted (AVE) with the correlations among the latent variables. The square root of AVE must be greater than any correlation involving the latent variable under analysis (Fornell & Larcker, 1981). In line with this, the conclusion reached was that the measurement instrument has good discriminant validity (refer to Table 2 in the succeeding texts).

Table 2. Latent variable correlation matrix

Latent variables	PG	CA	CP	WF	WE	PW	JD	NE	MC	TI
PG	**0.743**									
CA	−0.397	**0.768**								
CP	0.217	−0.070	**0.696**							
WF	0.077	−0.106	−0.010	**0.900**						
WE	0.331	−0.343	0.162	0.589	**0.918**					
PW	0.136	−0.137	0.027	0.604	0.600	**0.843**				
JD	0.392	−0.420	0.229	0.103	0.459	0.109	**0.868**			
NE	0.164	−0.061	0.194	0.066	0.142	0.133	0.002	**0.825**		
MC	0.070	0.030	0.218	0.086	0.135	0.102	−0.002	0.432	**0.822**	
TI	0.349	−0.218	0.372	0.213	0.498	0.215	0.430	0.347	0.287	**0.831**

PG, professional growth; CA, company affiliation; CP, career paradigm; WF, work-family conflict; WE, work exhaustion; PW, high perceived workload; JD, job dissatisfaction; NE, new experiences; MC, managerial capacity development; TI, turnaway intention.
Note that the square root of the average variance extracted (AVE) is depicted in **bold** print in the main diagonal of the matrix.

Lastly, construct reliability was assessed via composite reliability and Cronbach's alpha. According to Kock (2012), a measurement tool presents an acceptable reliability if the indicators associated with each latent variable are perceived similarly by different respondents. Values greater than 0.7 for the composite reliability and Cronbach's alpha of a construct attest the existence of adequate reliability (or internal consistency) for the latent variables measured. Only the CP construct failed to present an adequate value, which led to its exclusion from the model and the impossibility of testing hypothesis 3 already presented (refer to Table 3 in the succeeding texts).

Because all data are self-reported and collected through the same questionnaire during the same period of time with cross-sectional research design, common method variance – variance that is attributed to the measurement method rather than the constructs of interest – may cause systematic measurement error and further bias the estimates of the true relationship among theoretical constructs. As such, as recommended by Podsakoff *et al.* (2003), Harman's one-factor test was conducted in order to test the common method effect. Un-rotated principal component factor analysis and principal component analysis with Promax rotation both revealed the presence of twelve distinct factors with eigenvalue greater than 1.0, rather than a single factor. The 12 factors together accounted for 69% of the total variance, and the first and largest factors did not account for a majority of the variance (9.2%). Thus, according to Podsakoff & Organ (1986), while the results of these analyses do not preclude the possibility of common method bias, they do suggest that common method bias is not of great concern and thus is unlikely to confound the interpretations of results.

Thus, the results unveiled in this section indicate that the structural model developed can be tested, as the instrument tool presents adequate discriminant and convergent validities and, with the exception of the CP construct, the other constructs also show adequate reliability.

Structural model results

Two models were estimated in order to test the research hypotheses. The first model (Model 1) seeks to explain the TI variance accrued from the control variables, namely position in the IT area, IT field, educational level, size of the company and years of experience in IT. The first four variables are qualitative, and the remaining one is quantitative. The inclusion of these variables makes it possible to take into consideration that some specificities of the IT area are not related to the TI of the IT professional. In addition to this, the second model (Model 2) comprises the control variables and the variables involved in the hypotheses (variables of interest).

Before evaluating the statistical significance of the estimated coefficients (refer to Table 4 in the succeeding texts), it is necessary to verify whether or not there is any evidence of

Table 3. Reliability of the factors

Coefficients	PG	CA	CP	WF	WE	PW	JD	NE	MC	TI
Composite reliability	0.878	0.873	0.736	0.955	0.956	0.908	0.938	0.865	0.862	0.917
Cronbach's alpha	0.831	0.833	**0.461**	0.941	0.938	0.864	0.917	0.766	0.759	0.885

PG, professional growth; CA, company affiliation; CP, career paradigm; WF, work–family conflict; WE, work exhaustion; PW, high perceived workload; JD, job dissatisfaction; NE, new experiences; MC, managerial capacity development; TI, turnaway intention.

Table 4. Results of the structural model

	Dependent variable: turnaway intention									
	Model 1					Model 2				
	Coefficient (b)	Standard error	*p*-value	Effect size[†]	VIF	Coefficient (b)	Standard error	*p*-value	Effect size[†]	VIF
Control Variables										
Master degree	0.113	0.083	0.087	0.012	1.418	0.103	0.061	**0.046**	0.011	1.479
MBA degree	0.034	0.065	0.304	0.001	1.396	−0.038	0.056	0.249	0.001	1.462
Development	0.157	0.073	**0.016**	0.009	1.916	0.028	0.066	0.336	0.002	2.062
Infrastructure	0.045	0.063	0.236	0.001	1.480	−0.042	0.057	0.232	0.001	1.576
Project management	0.193	0.075	**0.005**	0.024	1.803	0.084	0.059	0.076	0.011	1.914
Implementation	−0.002	0.061	0.485	0.000	1.658	−0.047	0.055	0.199	0.004	1.722
Data base administration	−0.023	0.047	0.315	0.001	1.104	0.027	0.033	0.210	0.001	1.139
Governance	0.107	0.060	**0.038**	0.007	1.332	0.084	0.047	**0.036**	0.006	1.373
Support	0.075	0.054	0.084	0.000	1.348	0.017	0.050	0.366	0.000	1.399
System analyst	−0.023	0.138	0.433	0.001	5.861	−0.138	0.108	0.100	0.003	6.374
Consultant/specialist	0.036	0.129	0.389	0.001	5.624	−0.115	0.104	0.134	0.005	5.871
Supervisor/Coordinator	−0.030	0.129	0.408	0.001	5.741	−0.176	0.109	0.054	0.005	6.014
Manager/Superintendent	−0.003	0.122	0.490	0.000	5.666	−0.093	0.098	0.170	0.002	5.819
Large companies	0.093	0.118	0.215	0.005	2.828	0.099	0.097	0.155	0.005	3.145
Medium companies	0.063	0.109	0.281	0.001	2.749	0.064	0.090	0.240	0.001	2.941
Experience in IT	0.079	0.059	0.089	0.007	1.143	−0.002	0.075	0.489	0.000	2.602
Variables of interest										
PG						0.137	0.049	**0.003**	0.048	1.510
CA						0.019	0.069	0.391	0.004	1.473
WF						−0.024	0.064	0.356	0.005	2.088
WE						0.387	0.068	<**0.001**	0.193	2.792
PW						−0.049	0.059	0.201	0.011	2.079
JD						0.218	0.052	<**0.001**	0.094	1.667
NE						0.224	0.055	<**0.001**	0.078	1.371
MC						0.125	0.048	**0.005**	0.036	1.371
Age						0.045	0.075	0.275	0.005	2.682
Gender						−0.040	0.051	0.213	0.001	1.132
N	323					323				
R-squared	0.064					0.474				

PG, professional growth; CA, company affiliation; WF, work–family conflict; WE, work exhaustion; PW, high perceived workload; JD, job dissatisfaction; NE, new experiences; MC, managerial capacity development.
The values in **bold** print indicate a significance level below 5%.
[†]Cohen's *f*-squared coefficient (1988).

multicollinearity in the model, as well as investigate the presence of outliers (Hair *et al.* 2005). According to Hair *et al.* (2005), variables that present a VIF (variance inflation factor) greater than 10 are unacceptable in a structural model.

However, the results indicated the non-existence of multicollinearity, as none of the VIF values were greater than 10. Likewise, the presence of outliers in the data collected was not identified.

The goodness of fit of the model was assessed via R^2, which represents the fraction of the dependent variable variance explained by the independent variables pertaining to the model. The results revealed a significant increase in R^2 after including the variables of interest to explain the TI of IT professionals. Model 1 (only with the control variables) presents an R^2 of just 6.4%, whereas Model 2 (with the inclusion of the variables of interest) presents an R^2 of 47.8%. This increase of 41.4% is a meaningful result, as it shows that the variables accrued from the theory are good predictors of the TI of the IT professionals. However, it is necessary to evaluate the statistical significance of these variables in order to identify which of them are responsible for this increase in R^2. This identification is revealed when the hypotheses are tested with a 5% level of statistical significance.

After having presented the results obtained from the structural model, it is important to assess the magnitude of the influence of the IT professional TI antecedents accrued from the hypotheses tested. Cohen (1988) recommends the use of the *f*-squared coefficient to measure the size of the estimated coefficient *b*. According to Kock (2012), the *f*-squared coefficient represents the absolute value of the individual contribution of the variable to the *R*-squared coefficient. Cohen (1988) supports that for practical purposes rather than in statistical terms, *f*-squared equal to or greater than 0.35 indicates a strong effect on the dependent variable. The effect will be considered medium when *f*-squared is between 0.15 and 0.35 and low for values between 0.02 and 0.15. Independent variables with *f*-squared values lower than 0.02 have too weak an effect on the dependent variable to be considered relevant in practical terms, irrespective of their statistical significance (Kock, 2012). Based on this, one can conclude that while the Master degree (Model 2), development (Model 1), project management (Model 1) and governance (Models 1 and 2) control variables present statistical significances, their effects on the IT professional TI, in practice, are very low (Table 4). Thus, these variables can be disregarded in the final structural model.

Moreover, when analyzing the importance of the influence of the significant variables of interest in Model 2 on the TI of the IT professional, it becomes apparent that the WE variable has the highest *f*-squared coefficient (0.192); in other words, the factor exhaustion with work in the IT area has a medium effect on the TI of the IT professional. The other statistically significant variables (PG, JD, NE and MC) have little effect on the TI (Table 4). When the variables are sorted by their effect, from the more relevant to the less relevant variables, from a practical standpoint one obtains the ranking of the antecedent variables to the TI of the IT professional, namely:

H5: Exhaustion with work in the IT area ($f^2 = 0.192$)

H7: Job dissatisfaction ($f^2 = 0.096$)

H8: Need to acquire further experience and become of interest to the job market ($f^2 = 0.077$)

H1: Need for PG ($f^2 = 0.049$)

H9: Prior and conscious non-IT related MC ($f^2 = 0.033$)

Thus, a final structural model can be depicted in Figure 13 in the succeeding texts.
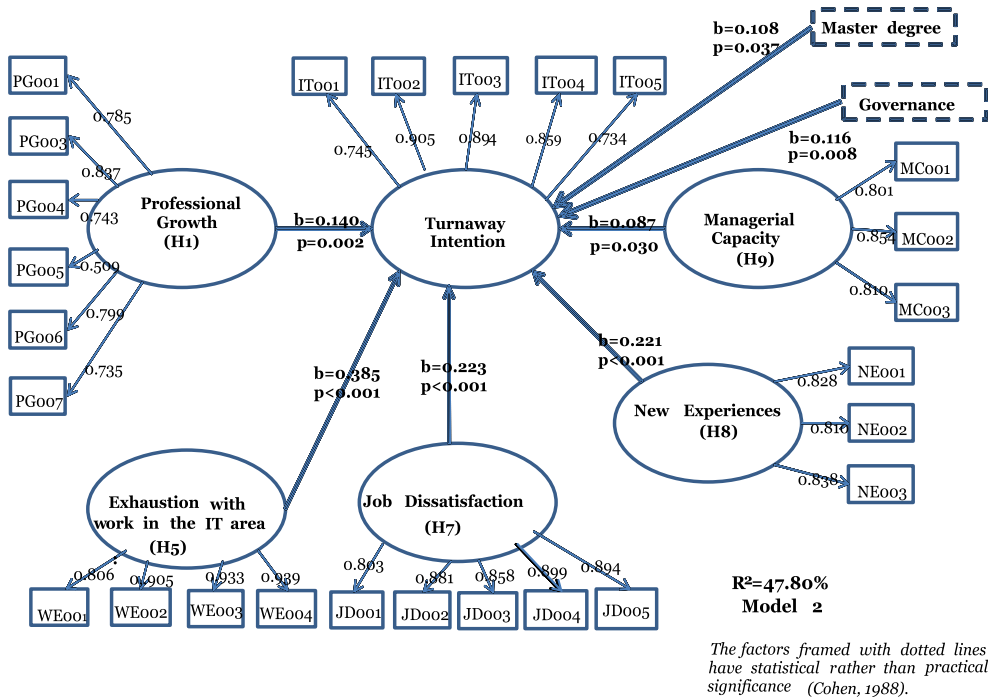
Figure 13. Final structural model.

DISCUSSION

In this section, the intention is to discuss the aforementioned results, present the managerial implications accrued from this work, as well as their limitations.

The need for PG is one of the supported antecedents of the IT professional turnaway phenomenon (hypothesis H1). The extant literature stresses the lack of growth opportunities in the IT arena (e.g., Clayton *et al.* 2012; Downey, 2012; Joseph *et al.*, 2012), which leads IT professionals to move either to other organizations, in which technical growth is still possible, or to other functional areas within the same organization, in which PG is more available than in the IT area, as supported by Turner & Baroudi (1986), Katz & Allen (1997), Lee *et al.* (1997), Karahanna & Watson (2006) and among others. Thus, the research reveals that PG in the IT area is limited, pointing to the fact that the premises of the Y career – from a certain point in their careers, professionals can follow either a technical or managerial path with a similar level of advantages and remuneration (Fleury, 1991) – have not been fully followed by some organizations. Therefore, IT professionals who seek professional advancement might include assuming managerial roles or moving to another functional area within their organizations or in another organization in their career plans.

Conversely, hypothesis H2 was not supported; i.e. there is no influence of the IT professionals' CA on their TI. While several authors support this hypothesis (Zabusky & Barley, 1996; Lee *et al.* 1997; Reich & Kaarst-Brown, 1999; Ashforth *et al.* 2008; Ramos & Joia 2011, 2013), it seems that this hypothesis depends on the type of company the IT professional works for, as well as

the organization's human resources policy. For instance, in Brazil, it is quite unusual to see IT or non-IT professionals leaving state-owned companies, as they will lose their job stability. Therefore, it seems that this hypothesis cannot be applied for any IT professional irrespective of the type of company (s)he is working for – a control variable not included in this work's model.

Hypothesis H3, namely that IT professionals who are motivated by the career advancement paradigm rather than the career accomplishment paradigm intend to turn away from the IT area to another area, while supported by Lee *et al.* (1997), Joseph & Ang (2001), Zabusky & Barley (1996) and Reich & Kaarst-Brown (1999, 2003) could not be tested because of its inadequate reliability as assessed by Cronbach's alpha. This means that the respondents do not have the same understanding of the question about this issue. This hypothesis was not supported by Ramos & Joia (2011, 2013) in one of the companies they studied and was only partially supported in the other company they investigated. Arguably, the concept of professional success is manifold, as supported by Zabusky & Barley (1996), there being CPs others than the ones investigated, namely the career advancement paradigm and the career accomplishment paradigm. This fact might have caused the respondents some confusion when answering the questions. A possible solution for this could be the use of the career anchors approach developed by Schein (1996), as several other paradigms are encompassed in this approach. Moreover, the IT career in Brazil is far from having been formalised and institutionalised by the government, being considered an occupation rather than a profession (Orlikowski & Baroudi, 1988 and Moura Jr. & Helal, 2014). This may be a possible reason for the IT professionals' misunderstanding when answering the questionnaire about their own career. However, this fact deserves further investigation.

Regarding hypotheses H4–H7 that unveil some sort of dissatisfaction of the IT professional with the IT career, exhaustion with work in the IT area (H5) and JD (H7) are considered antecedents of IT professionals' TI. The latter unveils the perception that the IT professional's job is not fulfilling or not allowing him/her to fulfil his/her major job aspirations (Locke, 1976) and can be associated with the low status the IT profession has both in Brazil and worldwide when compared with other functional areas, as supported by Orlikowski & Baroudi (1988) and Moura Jr. & Helal (2014). Besides, the former hypothesis was an expected antecedent of IT professional career transition in Brazil, because of the work conditions most of these professionals are subjected to.

Conversely, hypothesis (H6) that indicates the IT professional's heavy workload as an antecedent to his/her career transition was not supported, which seems to be at odds with H5, which supports that IT professionals' exhaustion related to their work might lead them to turn away to another functional area. However, exhaustion with work in the IT area accrues from several other reasons apart from heavy workload, as perceived by Moore (2000), such as ambiguity and role conflict, lack of autonomy to undertake tasks, insufficient training when compared with other areas and lack of rewards for the work accomplished. Furthermore, WFs (H4) are not considered an antecedent to IT professional career transition either, as supported by Adams *et al.* (1996) and Messersmith (2007). One of the possible reasons for this might be the intimate nature of this issue, which can lead the respondents not to be fully sincere when answering the questions associated with this construct (Dinger *et al.* 2010).

Moreover, hypothesis H8 reveals that IT professionals need more experience to grow professionally than their companies are able to offer or that is possible to find in a technical area, as supported by Mangia (2013), Ituma & Simpson (2009), Brown (2006), Martins (2001) and

Reich & Kaarst-Brown (1999, 2003). Thus, again, the premises accrued from the Y career do not seem to be consolidated in most organizations in relation to their IT areas (Fleury, 1991).

With respect to hypothesis H9, which is supported as an antecedent to IT professional TI, the results point to the fact that most IT professionals are aware of the need to move to another area and that they are pursuing training with a TI via non-IT related managerial courses aiming also to interact with business issues.

In turn, in Brazil, the lack of professionalization of the IT area leads same to be considered an occupation rather than a profession (Moura Jr. & Helal, 2014), which is also perceived by Emmerich (2012) in the USA and Ilavarasan & Malish (2008) in India. Thus, this lack of professional and social status of IT professionals in Brazil seems to lead some of them to pursue managerial positions in another functional area via experience in other business areas (H8) and/or executive education courses (H9).

While Kanfer & Ackerman (2004) and Ramos & Joia (2013) support that the turnaway phenomenon depends on the professionals' age, hypothesis H10 was not supported in this study. In other words, the hypothesis that IT professionals' age is an antecedent of their intenti0n to turn away to another functional area was not supported. The average age of the respondents is 39 and the average length professional experience in the IT area is 17 years, proving that most of them were middle-aged and experienced professionals already exposed to several stressful situations and challenges in the area and in their lives. Thus, this hypothesis deserves further investigation, in order to understand why IT professionals' age was not supported as an antecedent to their career transitions.

The IT field, in which the IT professionals work, was not perceived as an antecedent of their career transition (H11), although the dummy variables of Model 2 have shown that IT professionals who deal with IT governance are more likely to turn away than the others. Because of the type of work these professionals perform, they need to have a broad skill set as most of them are required to have multidisciplinary knowledge and interact regularly with the business area. Thus, according to Schropshire & Kadlec (2012), it was expected that this type of IT professional was more likely to turn away from the IT area. Therefore, further analysis is needed to better understand why for practical purposes rather than in statistical terms (Cohen, 1988) this professional is not more prone than others to move from IT to another area.

Lastly, gender was not an important issue in IT professionals' career transition (H12). This finding tallies with studies developed by Stewart *et al.* (2007), who found divergent results when analyzing the possible linkage between gender and turnover intention. However, this hypothesis deserves further investigation, as female IT professionals have to conciliate their professional duties with domestic affairs, which according to Trauth *et al.* (2009) and Clayton (2012) can lead them to abandon the IT area.

Managerial implications

The aforementioned section makes it possible to draw some managerial conclusions, by means of which a set of actions might be undertaken by companies and their IT areas in order to minimise the career transition of IT professionals to other areas.

Firstly, companies should assess the physical and emotional conditions of their IT personnel frequently in order to avoid their exhaustion with work in the IT area. According to Sethi *et al.* (1999) and Muir (2008), this exhaustion accrues from constant or repeated emotional pressure associated with intense involvement with people over a long period of time.

Secondly, it is also important for organizations to identify the factors that might cause stress in their IT professionals and pursue actions to solve or minimise this problem, as they can generate JD in the IT area and consequently lead these professionals to turn away from their careers in the IT area.

Thirdly, companies should define, clarify and communicate objectively the precise roles of the IT professionals who work for them, implementing actions to improve their working conditions and motivate them, as well as remunerate them for their work via reward programmes based on merit in a fair and equitable way.

Fourthly, companies could offer new opportunities to IT professionals, allowing them to grow within the organization either at the technical or managerial level, whereby they can acquire NE in order to minimise their quest for growth in other areas of their companies or even in different organizations.

Lastly, companies could also sponsor executive courses for their IT personnel, in order that they can develop a skill set to assume managerial positions in the IT area within the organization, rather than merely technical roles. However, this study has established that this kind of initiative can lead the IT professional to move from the IT area to another. Therefore, the companies need to cope with a trade-off between providing training for their IT professionals in order that they can attain PG, as well as acquire NE, and retain these professionals in the IT area after the training.

It might not be correct to say, however, that the onus of making it easier for the IT professional to remain in the area should be placed squarely on the organization's shoulders. From the results accrued from this work, it seems that there are idiosyncratic factors that convey IT professionals to move to another job function or to remain in the IT career (see Joseph *et al.*, 2007, p. 563). The CPs approach might help academics to better understand this point. However, Hypothesis H3 addressing this issue cannot be tested in this work and deserves to be researched in greater depth.

Limitations of the study

This work is not completely without limitations.

Firstly, hypothesis H3 could not be tested, as the 'CP' construct did not show adequate reliability to be kept in the model. While backed by several authors (Zabusky & Barley, 1996; Lee *et al.* 1997; Reich & Kaarst-Brown, 1999, 2003; Joseph & Ang, 2001; Joseph *et al.* 2007), it seems that the respondents felt confused about these career approach differences. Moreover, according to Ramos & Joia (2013), it seems that the respondents perceive other career approaches besides the ones presented. Thus, it is necessary to develop a specific study for this construct, testing the content and validities of the questionnaire, as proposed by Gravetter & Forzano (2012), before assessing the construct reliability of same in further studies.

Secondly, there is the possibility that not all the theoretical references addressing IT professional career transition to another functional area have been applied in this study, notwithstanding the

fact that the authors developed a protocol to search for articles addressing the IT professional career transition to other functional areas, as explained earlier in this paper.

Thirdly, most of the measurement instruments used in this research were adapted from scales developed and tested to investigate the IT professionals' turnover rather than the IT professionals' turnaway phenomenon because of the lack of specific extant scales. As such, it is possible that, while satisfying reliability and validity tests, some indicators might be replaced by others more suitable for measuring the IT professionals' turnaway phenomenon.

Fourthly, other methodological approaches might have been used, such as focus group approach or Delphi method, among others, that might have reinforced or challenged the conclusions herein presented via qualitative analysis.

Fifthly, this study investigates the IT professionals' TI to move to another functional area rather that their actual movement to same. According to Joseph *et al.* (2007), p. 562, the use of IT professional's turnover intention as a proxy for turnover behaviour can result in weak and inaccurate inferences at times, making it important to assess actual turnover behaviour. Likewise, one can transplant this rationale to the IT professionals' turnaway realm.

Finally, another limitation is related to the acuity of perception of the IT professionals involved in relation to their career transition. According to Scandura & Williams (2000) and Bertucci (2005), these limitations are related to the possibility of many varied interpretations of reality given by the respondents, in their attempt – not necessarily conscious – to paint a good picture of their companies, to limitations of information available while they answer the questionnaire and to the epistemological style of the respondent.

CONCLUSIONS

This research establishes that career transition in the IT realm is heavily linked to the dynamics of the area and the working conditions the IT professionals are subjected to. This reality promotes a sense of dissatisfaction among these professionals that leads some of them to pursue managerial training and new work experiences. This enables them to expand their interpersonal contact network and locate opportunities in different knowledge fields that might enable them to migrate to other functional areas where better working conditions, rewards and possibilities of PG are to be found.

Moreover, this work indicates the need to intensify research into the turnaway phenomenon among IT professionals in developing countries such as Brazil, as it is of paramount importance for these countries to avoid this phenomenon in order to be included in the current knowledge society. Thus, it is necessary not only to foster the training and intake of professionals into the IT arena, but also to develop organizational policies to ensure that they will remain in this area, thereby avoiding the turnaway phenomenon.

Besides, it is important for Brazil to develop regulatory policies that make it possible for IT professionals, as well as society in general, to perceive IT as a profession rather than an occupation, affording them a well-defined professional and social status, as well as specific duties and rights.

Moreover, since this is not a cross-cultural study – as this work addresses the IT professional turnaway phenomenon purely in the Brazilian context (Moura Jr. & Helal, 2014) – different

antecedents to the IT professional's transition career might have been obtained within other national contexts. In the same vein, it is possible that some of the IT career transition antecedents found in this study may or may not be the same for other areas, such as accounting and law. These issues can be tackled in further studies.

Lastly, it is hoped that this work might lead IT professionals to be more aware of their professional careers and the turnaway phenomenon, as well as ensure that companies and governments have a clearer understanding regarding how to retain IT professionals in the IT area for the sake of society as a whole.

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