TOWARDS DEVELOPING CAREER TECHNOLOGY FIT FRAME WORK AND ANALYZING ITS INFLUENCE ON WORK RELATED OUTCOMES AMONG IT PROFESSIONALS

Gunjan Tomer

Doctoral Student, IS area,

Indian Institute of Management, Indore

Email-id: f10gunjant@iimidr.ac.in

Mobile no. :+91-9993477788

ABSTRACT

With growing attrition rate and significant demand for skilled IT professionals, the importance of studying their behaviour has become important for both academia and industry. Despite ample amount of research, there is still a gap between theory and practice. Based on our qualitative study conducted on Indian IT professionals we propose that technology allocation might contribute in understanding the behaviour of IT professionals. We found that IT professionals evaluate the technology allocated to them based on their individual preference. This evaluation, either positive or negative, influences their job outcomes. As the role of technology allocation on the behaviour of IT professionals has not been studied, we explored various dimensions of the phenomenon. Career need and technology characteristics were found as significant corresponding constructs. Both constructs lead to "Career Technology Fit" among IT professionals that might affect work related outcomes.

Keywords: *Technology characteristics, grounded theory, qualitative method, technology allocation, IT professionals.*

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INTRODUCTION

"It was 10am at the sprawling training campus of one of the leading IT firms in India. One of the newly recruited batches of engineers has finished their initial training and now it is the time to be inducted as IT professionals. They will be informed about the technology they will be working in, and the location they have to report for their formal joining process. This time brings a lot of anxiety among the employees. As one of the respondents quoted, "*I was hoping to get ERP (Enterprise Resource Planning); because I plan to get technology consulting profile in the future...but didn't get even the development profile...support is not for me, but what choice I do have...*".

-- Interview with an IT professional

Technology is an inherent part of any IT professional. The technology in which they work affects their professional as well as personal lives. A major part of their work role consists of a complex process of software development that demands a high level of technical proficiency and diligence. In order to ensure better performance of these professionals, it is

essential that they assign a positive valence to their work (Sarker et. al., 2010). However, there are multiple challenges that hinder their performance.

Literature has explored many such challenges, for instance technostress (Tarafdar et al., 2007), work life conflict (Sarker et al., 2010), globally distributed software development system (Prikladnicki et al., 2003; Sarker & Sarker, 2009) and job stress due to fear of obsolescence of technology (Pazy, 1994; Trimmer et al.,1998). These factors directly or indirectly are related to technology or to different aspects of technology assigned to them. Technology is conceptualized as a differentiated entity having various aspects or characteristics rather than a single entity (Nelson, 1990). For instance technostress is defined as a stress observed by the individuals because of technology characteristics such as complexity, invasion and uncertainty (Tarafdar et al., 2007; Ayyagari et al., 2011). Similarly invasion of technology in an individual's personal life leads to work life conflict (Greenblatt, 2002) which in turn leads to increased level of stress (Chen, Powell & Greenhaus, 2009) and decreased well being (Felstead et al., 2002). Studies also highlighted other aspects such as complexity and radicalness of technology (Aiman-Smith & Green, 2002). Surprisingly, literature is silent on the impact of various attributes of technology on the attitude and behaviour of IT professionals.

During our field study we found an interesting dimension, i.e. technology allocation and its influence on IT professionals. We noticed that individuals differ in their preferences to work in a particular technology. We tried to explore the phenomenon. Unfortunately, we did not find any relevant study relating technology allocation to the attitude and behaviour of software professionals in major IS journals as well as in journals in management. We noticed that individuals' career preferences play a significant role in deciding their preference

towards technology. The lack of research on the phenomenon motivated us to investigate it further. We focused our study on IT professionals for following reasons.

One, the global software development (GSD) has triggered growth in IT industry in many developing countries including India. Prior studies have focused on various advantages of GSD such as cost advantage (Sahay et. al., 2003), competitive advantage (Carmel & Agarwal, 2002) and tapping technical skills across the globe (Carmel 1999). However, GSD has lead to newer challenges at work for the IT professionals such as cross cultural barriers, time boundaries, and co-ordination of GSD teams (Krishna et. al., 2004). We observed that the human resource dimension regarding the management of IT professionals at these GSD sites is relatively under researched. The present study focuses on the IT professionals as the GSD work settings are unique to the IT industry. Second, IT organizations (the GSD sites) recruit a large number of IT professionals every year (NASSCOM, 2012). For example, Infosys, one of the leading Indian IT organizations employs one and half million IT professionals as compare to 97,000 professionals in Microsoft Corporation (Infosys, 2013; Microsoft, 2013). Given the large employee base, human resource issues are crucial. One of the factors, i.e. the allocation of technology on which they start their professional career might influence the attitude and behaviour of these professionals. Hence, there is a need to explore the factors that influence the preferences of these employees towards certain technologies. Third, India is one of the major GSD sites (Robinson & Kalakota, 2004) and has a significant share of global IT professional's workforce. We believe that India will be an interesting geographical location to undergo our study. Four, IT being a growing industry, there is a pressing need to address the lack of talent pool in this industry. Further, attrition is higher in IT industry compared to the other industries (Joseph et al., 2007).

THEORETICAL FOUNDATION

Theory of Person Environment Fit

The theory of person environment fit (PE fit) was initially proposed by French, Rodgers, and Cobb (1974). The PE fit theory has been employed as a theoretical lens to study various phenomena both at individual and organization level. The theory states that work outcomes are not independently derived from individual or environmental factors, but from the linkages of both (French et. al., 1974; Kristof, 1996), leading to a congruence or fit. How we perceive the fit is also a relevant question while working with a PE fit model. The literature has conceptualized PE fit either as complementary fit or supplementary fit. Complimentary fit further diverges as need-supply and demand-abilities (Kristof, 1996) where studies on supplementary fit have focused on the similarity of both person and environment dimension (Muchinsky & Monahan, 1987). There is ample amount of studies done which deals with the outcomes of PE fit. The occurrence of "fit" between the person and the environment are found to be resulting in high performance, satisfaction, and low stress (Pervin, 1968; Cooper et. al., 1976; Frese, 1985; Cooper et al., 2001), adjustment and job satisfaction (Dawis & Lofquist,1984), work design (Kulik, Oldham, & Hackman, 1987), mental health (Furnham & Schaeffer, 2011) and work life conflict (Chen, Powell & Greenhaus, 2009).

Technology characteristics

Technology can be categorised into its attributes on the basis of its impact on individual attitude and behaviour. Different studies have described technology on various dimensions and have discussed their impact on various individual and organizational variables. For

instance, one of the studies in the manufacturing context relates technology characteristics like radicalness and complexity with quality of learning and project success (Aiman-Smith & Green, 2002). Certain technology characteristics such as obsolescence argued to create anxiety and stress among individuals (Pazy, 1994). The technology acceptance model or TAM (Davis, 1988; Venkatesh et. al., 2000) explained the user acceptance of a technology on the basis of particular features or characteristics of technology such as perceived usefulness and perceived ease of use. Recent studies on technostress (Ayyagari et al, 2011; Ragu-Nathan et al. 2008; Tarafdar et al. 2007) which asserts that technology characteristics (such as complexity, presenteeism and pace of change) lead stress among IT professionals.

METHOD

Using grounded theory (Glaser & Strauss, 1967) approach we tried to understand how technology allocation is evaluated by the IT professionals and why a particular aspect of technology is preferred by an individual.

Research design

We initiated this study with a pilot phase by conducting interviews with IT professionals. The objective of conducting the pilot study was to understand the phenomenon and to achieve a preliminary understanding of the impacts of technology allocation. We expected that the findings will help us in strengthening our research design.

Preliminary findings from the pilot study: Insight for full study design

The findings from our pilot study refined our understanding of impact of technology allocation on IT professionals. We decided to have a broad range of respondents who belongs

to both small and large sized firms. We tried to include employees from both product based and service based firms to ensure that we are including all possible sites where the phenomenon can be observed. We also had discussions with human resource managers in leading Information technology firms regarding their entry level recruitment process and lateral project allocation. There were some very interesting directions from the responses. We found that unlike the product based firms, the service based firms allocate technology after recruiting their employees. The preferences of individual employees are never accounted in the technology allocation process in large firms. Smaller firms are more transparent about technology allocation and in most cases the technology is revealed to the employee before s/he joins the organization. We observed higher levels of dissatisfaction among the employees in large service based firm's regarding unfavourable technology allocation. Based on these findings and the literature (Eisenhardt 1989, Pratt et al, 2006), we have employed extreme case context for our study. We have selected our participants from large service based IT organizations as the phenomenon was more dominant in these organizations.

Second stage study

We intended to understand different aspects of the phenomenon and hence, included IT professionals with a minimum of six months experience to six years of experience. We observed that professionals who have work experience greater than six years mostly exhibit career progression in managerial roles. We included human resource managers in this study to as they are involved in the process of resource acquisition and technology allocation. The total number of respondents was forty two. Interviews were conducted where participants

responded to a semi structured questionnaire. The average duration of the interviews was 45-60 minutes. All the responses were transcribed within 24 hour of the interview.

Data Analysis

Consistent to grounded theory process, data analysis was done in an iterative basis through constant comparative method (Glaser & Strauss, 1967). Data was analyzed back and forth to generate as many emerging categories. We adapted a three step process to generate theory which was in accordance of with four stages explained by Glaser and Strauss (1967), "(1) comparing incidents applicable to each category, (2) integrating categories and their properties, and (3) delimiting the theory.

The first level categories were created by abstracting statements and views of respondents (provisional themes), which represent their perspectives. These themes were combined and generalized by comparing responses and putting them in common categories. These categories were revised continuously with new set of responses so that the emerging theory becomes richer. We employed an iterative process for fitting data into categories and verifying it with data again to modify or abandon categories. We attempted to name the categories based on the meaning offered by the dimension and through various brain storming sessions with our peers. We also collected and examined expert reviews for all the categories to ensure that our data analysis is not affected by researcher's bias and identical categories and theoretical dimensions are emerging from separate analysis of data.

FINDINGS

Resource acquisition and allocation

For source traingulation, we collected data from multiple sources. To establish understanding of resource accquisition and technology allocation process we collected responses from both human resource managers and the IT professionals.

The recruitment process

The recruitment process for IT professionals is conducted at two major levels: on/off campus recruitment and lateral recruitments. Where campus placements are conducted to induct fresh engineering graduates as entry level IT professionals, lateral placements are for experienced IT professionals. However according to a human resource manager for campus recruitments the skill requirements are general in nature and focus is more on the soft skills and aptitude of the candidate

"It is true that at the time of recruitment drive which employee will work for what technology is not decided...it is the job of technical heads...we hire as per the skill set required for that particular position. Usually for on- campus drive communication skills and general IQ is tested"

Hire for company

The "hire for company" process as named by one of the respondent refer to the recruitment process where business requirements drive the hiring process and usually during the recruitment, technology requirements are often unknown. This is a usual case in campus placement processes.

"The basic idea is to hire suitable candidates for company...we look for candidates with good general aptitude, learning capabilities and communication skills... these skill sets are generic and can further be groomed as per the company requirements, we hire for company, not to work in particular technology."

Technology/project allocation process

Respondents mentioned that prior experience in the technology plays an important role in future project allocation; and hence, initial level technology allocation and technology trainings affect the opportunities both inside and outside the organization.

"...it is almost a vicious cycle, you get a technology that doesn't fit in your career expectations you get trained for that and you end up getting more projects in that.tec The objective was to understand the influence of initial level technology allocation on employee's career management and job outcomes tec*hnology"*

We tried to understand the match between individual preferences and technology characteristics. To explore the fit we asked the IT professionals about the flexibility in choosing technologies which are more suitable to their expectations. Based on the findings regarding technology allocation our first proposition is as follows.

Observation1: The process of technology allocation in large service based Indian IT organization is business requirement driven and the individual preferences and suitability is not determined to allocate a specific technology.

Career need and motives

Most of the respondents mentioned that allocation is done at the organization level. They stated that though there is a provision to reject one or two projects, this is seldom practised as this might lead to increased 'on bench' time. They shared insecurities in regard to their inclusion in "on-bench" or "free pool" resource.

"...sitting on bench is worst thing that can happen to you in IT industry...it puts so much pressure on you to get a project soon...It may sound good at first place, no work full pay, but it is not a very good sign for the future career."

Most of the respondents shared their concern about technology allocation and shared their dissatisfaction working with the allocated technology. We observed that in spite of working at similar organizational levels, respondents exhibited varied career expectations. Predominantly the responses were around the issues related to career management (both inside the organization and outside the organization). While analyzing the data, we seek the help of our judgment, literature, and expert advice to come with following dimensions. However role of technology has not been studied in literature, there are studies (Ginzberg & Baroudi, 1988; Igbaria et al. 1991; Crepeau et. al., 1992; Jiang et. al., 2000; Hsu et. al., 2003; Chang et. al., 2010) which contributes to the understanding of career motives of IT professionals.

Challenging job

We found that many respondents expect challenge in their job and expected to work better if they encounter difficult tasks in their job.

"I want my work to keep challenging me…I like code design and I keep modifying code for performance optimization"

"I cannot work in a job if I am not able to utilize my skill set and I am not earning any competency …"

Preference for managerial job role

This category of respondents expressed their interest in coordinating their team members and taking the responsibility for execution of particular task.

"My team members rely on me for their queries…I keep coordinating so many tasks in our project. I like managing my team and resolving conflicts"

Entrepreneurial aspirations

Some of the respondents pointed out that they aspire to start their own enterprise and they don't have interest in continuing the current job for very long.

"I am working on launching my own recommender tool...my friend and I was working on the designing since last many years and we are now working on to sense the market potential."

Work life Integration

As defined in literature integrating Work life refers to 'helping employees to balance the demands of work with those of their lives beyond the workplace' (Nord et al., 2002). The conflicts in managing both professional and personal lives were mentioned by many respondents.

"... 12 in midnight and my phone was ringing...one more support issue...some bug identified...it sometimes feels so much tiring specially when you were able to come back home at 9 PM."

Technical expertise

There were respondents who valued their technical skill and expertise. They mentioned that they have excelled in their technology and there are very few professionals in the market who were holding these expertises. They shared that they see their growth in standing out as technocrats.

"After SAP acquisition, Business Object Data Integration (BODI) tool has some changes in its interface. Due to new updates we have to keep our team keep acquiring expertise. Being at junior level I am one of very few employees who are expert in usage of all these modules. I often take KT (knowledge transfer) sessions even for my seniors and managers. That gives me lots of encouragement and satisfaction."

Observation 2: The allocation of a particular technology impacts the personal and professional life of an IT professional.

Technology characteristics

We tried to understand what are the factors that influences the preference of IT professionals towards a particlular technology. Based on the interview responses, we segregated the provisional themes and explored the following technology characteristics.These characteristics correspond to individual level career expectations and might cause positive or negative job outcomes among IT professionals.Table 1, using data illustrations, has summarized how these characteristics evolved as theoretical categories.

Significance of technology

The prevalence of a particular technology in the IT industry influences the interest of individual for that technology. One of the respondents mentioned that it not only increases the chances of getting good projects inside the organization but also enhances the opportunities of getting good jobs outside the organization.

Challenging technology

The job of IT professionals mostly comprises of technical work. They have inherent interest in technology and for some respondents the challenging nature of job is a source of motivation.

Work-life balance

This characteristic indicates the nature of technology which demand work at odd hours. Most IT professionals are somewhere involved in GSD (King & Torkzadeh, 2008) and have to work in different time zones. These requirements have direct impact on the work life balance of employees and also lead to conflicts in desired life style integration.

Technology growth potential

We found that incentives such as onsite opportunities and the probability of getting promotions make a technology more lucrative. It suggests that technology is preferred because of its perceived growth in near future.

Technology uncertainty

The extinction of technology is often faced in IT profession. This technology obsolescence contributes to higher level of job insecurity. This might negatively affect individuals with higher need of security and stability.

Technology characteristics	Examples and illustration from data
Significance of technology	"…technologies like Java and Oracle are ubiquitous and they are staying for long..IT firms have major usage of few dominant technology in numerous projects…working in those technology not only keep you in the job inside an organization i.e. lesser on-bench time but also ensures lucrative job offers from competitive organizations."
Challenging technology	"I get motivation only when I feel that I am utilizing my skill set. After spending years in learning this profession I don not expect to have a job which even a school pass out with little training can do…I want a job which is intellectually stimulating""
Work-Life balance	"it depends on the technology you are working in…people working and trained in support tools and testing technologies are often required round a clock…the job hours are often odd as they have to co-ordinate with the onsite team."
Technology growth potential	"technologies which are crucial to business functions are sough after…you can get consulting profiles and moving up in job hierarchy is more probable..like APG…it is a bit difficult to have command on this but once you are good in it you can really grow in your career."
Technology uncertainty	"Technologies keep changing..some survives and evolve with new up gradation and some vanishes…and the fate of technology is closely related to your career…it is possible to learn new technology, people keep doing that but it is not very easy also"

Table 1: Theoretical categories and data illustrations

Career technology fit

Our study pointed out that the individual level factors determine the preference for a specific technology compared to other technologies. This lead to a fit which can be defined as congruence between employees and the technology allocated to them. Building on our data and drawing from the relevant theories such as PE fit theory; we propose a new construct named 'Career Technology fit' (CT fit). CT fit connotes the match between the career preferences of the employee and the technology allocate to him/ her (See proposition 3). The CT fit can be determined by the discrepancy between what an individual need and what a technology provides. Based on our data, we feel that the perception of fit between the career requirements and the technology allocation might influence the work outcomes of IT professionals.

Observation 3: The IT professionals assess the match between technology they are working in and their individual career expectations and determines the suitability(fit).

Influence on work outcomes

We encountered many statements (see figure 1), which were pointing towards the evaluated fit or misfit between the career expectations and technology allocation among IT professionals. Based on our review of PE fit theories we conceptualized CT fit and proposed the linkages between CT fit and work related outcomes.

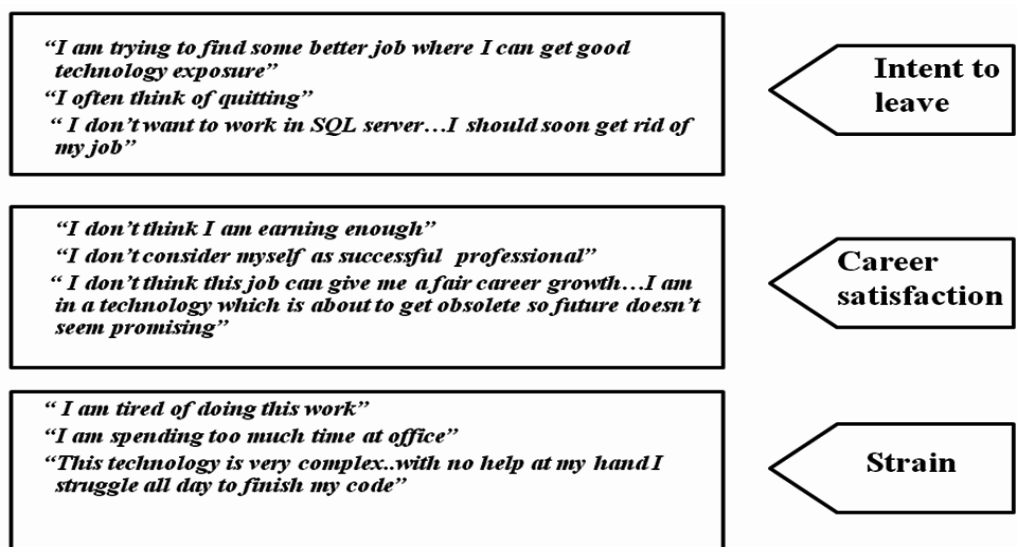**Observation 4:** The suitability(fit) of the technology will affect the work outcomes.

Figure 1: Data illustration for the work outcomes

DISCUSSION AND RESEARCH CONTRIBUTIONS

The results of the study explore the effect of technology allocation on work outcomes of IT professionals. Our findings depict that how technology allocation is evaluated by an IT professional and how the process of adjustment influences their work outcomes. Our results indicated that the career technology fit is affected by: (1) Whether the allocated technology is interfering with their personal lives leading to work life conflict, (2) Whether the allocated technology is likely to be obsolete causing stress of job loss and professional failure and (3) Whether the allocated technology provides professional challenge to the IT professional.

Our findings have implications on human resource allocation in software firms which has been identified as an important challenge (Niederman et. al., 1991).The career-technology fit is expected to influence various outcomes like career satisfaction, strain and turnover intentions. It is essential that IT organizations make sufficient effort to provide a positive work environment in order to retain and motivate the current IT professionals (Mone, 1994).

The study also contributes to PE fit literature by explicating match between technology level characteristics and individual factors. The findings can also be employed for managing congruence between internal and external career of IT professionals.

Our study offers implications for the global software development firms. This study contributes to the scant research on work dynamics of IT professionals working at GSD sites. We believe that our findings will be applicable in similar economies where large numbers of IT professionals are working in GSD environment. However it is the limitation that we are conducting this study in one country. It will be interesting to find the impact of technology allocation in different socio-cultural and economical regions.

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