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UNDERSTANDING PERSON TECHNOLOGY FIT AND ANALYZING ITS INFLUENCE ON WORK RELATED OUTCOMES AMONG IT PROFESSIONALS

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Abstract

Following the grounded theory approach among IT professionals in India we explored the contribution of technology allocation on their behavior. We found that IT professionals evaluate the technology allocated to them based on their individual perceptions and needs. This evaluation, either positive or negative, influences their work outcomes. Further, we explored the factors that make a technology preferable to these professionals. As the literature is relatively silent on the role of technology allocation in predicting the behaviour of IT professionals, we explored various dimensions of technology. We coined the word “Person Technology Fit” to capture the fit between individual preferences and the characteristics of given technology to the professionals. The contribution of the study in exploring the behavior of IT professionals was discussed.

Keywords: Technology characteristics, grounded theory, IT professionals, PT fit.
1. **RESEARCH OBJECTIVE AND THEORETICAL FOUNDATION**

“It was 10am at the sprawling training campus of one of the leading information technology (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 were informed about the technology they will be working in. This time usually brings a lot of apprehensions 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 (function) is not for me, but what choice I do have...”.

--- Interview with an IT professional

Technology and its impact on individuals has been one of the most prominent research areas in the field of management. The various outcomes of technology on the users of technology has been studied extensively in literature and it was found to influence productivity, efficacy, and efficiency of individual users (Venkatesh & Davis, 1994, Speier et al., 2002), induces negative consequences among them such as technostress (Ayyagari et al., 2011) and leads to work life conflict (Ahuja et al., 2007) and actual turnover (Speier & Venkatesh, 2002). Despite ample amount of research in this area, studies determining the impact of technology on IT professionals are conspicuous by their absence. Technology being an inherent part of the work life of any IT professional, it is expected to affect their professional as well as their personal lives. A major part of their work role consists of a complex process of software development that demands high level of technical proficiency and diligence. Unlike technology users, usage and adoption of technology is not a work enabler but the work itself. 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) or they assign positive valence to the technology they are working in. Before addressing question of assessing the impact of technology, it is essential to understand how technology is construed by the IT professionals.

Technology has been defined and studied in literature through its various characteristics. Nelson (1990) suggests that technology should not be studied as undifferentiated entity, rather exploring various dimensions and characteristics of technology will offer better comprehension. It will also help in assessing the impact of technology on individuals, which can also be classified based on the resulting outcome. Literature has explored many such classifications, for instance technostress (Tarafdar et al., 2007), work life conflict (Sarker et al., 2010) 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 impacting individuals. For instance technostress is defined as a stress observed by an individual 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 of technology such as complexity and radicalness of technology (Aiman-Smith & Green, 2002) which are supposed to impact performance related outcomes. Despite much research on defining technology through its various characteristics, technology and its impact has not been studied from the perspective of IT professionals. Since technology has a distinct role in professional and personal lives of IT professionals, it is worth exploring that how they comprehend technology and how they are impacted by a given technology. It is also possible that these technology...
dimensions are different than the one which are studied extensively in IS literature; which justify the need to conduct the present study.

Orlikowski and colleagues (2001) explained that the understanding of technology for an individual is dependent on the perception of an individual towards a particular technology. Since individual differs in their need same technology can be perceived in different ways by different individuals. According to Venkatesh and Speier (2002), “people have different expectations and needs. Individual characteristics can lead to different perceptions about a particular technology”. One of the most prominent theoretical models, Technology acceptance model (TAM) proposed by Davis (1989) and Venkatesh et al. (2000) discusses usability and perceived ease of use as significant technology characteristics that influences the perceptions and attitudes of individual users. TAM explicates impact of technology characteristics on intent to use a certain technology. However the whole stream of literature around TAM focuses on users of technology and we believe that due to technical nature of their work (developing and managing Information systems) IT professionals perceive technology differently than the other users of technology. So far we have not come across studies that focus on technology from the developers’ perspective i.e., the IT professionals.

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. 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 (Prikladnicki et al., 2003). IT organizations (at 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 and the human resource dimension regarding the management of IT professionals at these GSD sites is relatively under researched. Hence an understanding of technology and its allocation might help in the management of IT professionals

Second, there is a clear lack of studies explaining the impact of given technology on IT professionals. Although theories of task technology fit and technology acceptance model works on a similar premise of fit between individuals and technology, they explain the phenomenon from a different vantage point. The respondents of both the research models were technology users, where technology plays an important role in successful completion of their work whereas in our study respondents are IT professionals and technology is not just a resource to complete a given task. We are proposing that there can be dimensions of technology that are relevant to IT professionals only, considering the significance of technology in their work life. During our field study 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 journals in management. The lack of research in explaining this phenomenon motivated us to investigate it further.

We did this study in India as it is one of the major GSD sites (Robinson & Kalakota, 2004) in the world.

The present study focuses on the following objectives: (1) exploring specific characteristics of technology and (2) Understanding the possible linkage between the fit of individual preferences with given technology and the work outcomes of IT professional. Using
grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990) approach we tried to understand how technology allocation is evaluated by the IT professionals and whether this allocation impacts their work outcomes.

2. THE STUDY

The present study was conducted in two phases. First, we conducted a preliminary study and for this purpose we visited IT organizations and interviewed IT professionals (n=12). The objective was to understand the existence of the phenomenon and to achieve a preliminary understanding of the significance of technology allocation. The findings from the preliminary study guided our main study. The final study was done among 42 IT professionals.

Using grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1990) approach we tried to understand how a given technology is evaluated by the IT professionals and how technology impacts their work outcomes.

3. FINDINGS

3.1 First phase of the study

The findings from the study refined our understanding of impact of technology on IT professionals. We interacted with a broad range of respondents who belongs to both small and large sized firms. We included 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 IT 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. Further, the preferences of individual employees are not considered 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 firms regarding unfavorable technology allocation. Based on these findings and the literature (Eisenhardt 1989, Pratt et al., 2006), we followed extreme case context in our study. We have selected our participants from large service based IT organizations as the phenomenon was more dominant in these organizations.

3.2 Second phase

We intended to understand different aspects of the phenomenon and hence we included IT professionals with a minimum of six months experience to six years of work 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 as they are involved in the process of resource acquisition and technology allocation. The purpose to include HR managers in our study was to understand the process of technology allocation and attain different perspectives on the phenomenon. It also helped our study in achieving data triangulation by understanding the same phenomenon from different data sources. However, responses from HR managers were limited to explain the acquisition and allocation process prevalent in Indian IT industry. The total number of respondents was forty two (see table 1). The average duration of the interviews was 45-60 minutes. All the
responses were transcribed within 24 hour of the interview. The transcription were recorded in MS word format with times new roman font, size 12 and spacing one. The transcription covered total six hundred ninety pages. We concluded our data recording after we achieved the stage of theoretical saturation as practiced in the grounded theory methodology.

<table>
<thead>
<tr>
<th>Profile of participants</th>
<th>Number of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT professionals</td>
<td></td>
</tr>
<tr>
<td>6 months to 2 years</td>
<td>16</td>
</tr>
<tr>
<td>2 years to 6 years</td>
<td>19</td>
</tr>
<tr>
<td>HR managers</td>
<td></td>
</tr>
<tr>
<td>4 year to 9 year</td>
<td>7</td>
</tr>
<tr>
<td>Total number of respondents</td>
<td>42</td>
</tr>
</tbody>
</table>

Table 1: Profile of the participants

4. DATA ANALYSIS

Consistent to grounded theory process, data analysis was done in an iterative basis through constant comparative method (Glaser & Strauss, 1967). Back and forth analysis of the data was done to generate as many emerging categories as possible. We adapted a three step process to generate theory which was in accordance of with the 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 detailed process of analysis will be provided in the main paper (illustrated in Figure 1). We attempted to name the categories based on the meaning offered by the dimension and through various brain storming sessions with our peers. Please tell about first order coding, theoretical categories and aggregate dimensions.

We shared our transcription with five other coders and after many constructive discussions we finalized our theoretical categories. The conflicts and disagreements were resolved with the help of literature review, follow up interviews and discussions. We have illustrated the data analysis process in appendix A.

5. FINDINGS

5.1 Individual needs and motives

Most of the respondents shared their concern about technology allocation and shared their dissatisfaction regarding their given 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 and outside the organization). While analyzing the data, we seek the help of our judgment, literature, and expert advice to come with the following dimensions. Though adequate studies have not been done regarding the role of technology on IT professionals, 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.
Figure 1: Overview of data structure
We found that many respondents expect challenge in their job and expected to work better if they encounter difficult tasks in their job. However there were many contrasting responses also where the participants have admitted that they would like to get simple task and work in easy to learn technologies as it will help them to remain at ease at the work place.

“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”

The conflicts in managing both professional and personal lives were mentioned by many respondents. Thus the theme of work life conflict was identified as an important emergent theme.

“... 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”

Observation 1: The allocation of a particular technology impacts the personal and professional life of an IT professional.

5.2 Technology characteristics

We tried to understand the factors that influence the preference of IT professionals towards a particular technology (refer appendix B for list of technologies). Based on the interview responses, we segregated the provisional themes which represented different dimensions of technology. These theoretical categories represent technology characteristics which contribute in understanding how IT professional perceive and evaluate a particular technology. Our data analysis indicates that evaluation of a technology is a complex process which involves assessment of a technology on multiple dimensions. For instance, one of the respondents shared his views on a particular technology.

“After SAP acquisition, Business Object Data Integration (BODI) tool had 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.”

From the above narrative we can infer the following:

1. We can infer that the respondent is working in a new technology.
2. Some technologies keep changing and updating. External factors such as merger and acquisitions also affect the future of technology; which are difficult to predict.
3. Respondent derive satisfaction from learning new technologies and seek challenge in his/her job

We found similar narratives which discussed about changes and updation in particular technologies. The analysis of these narratives pointed towards unpredictability of future of technologies. We also found that while few respondents were interested in working in continuously changing technology, few were averse of these working situations. Based on our data analysis we abstracted this phenomenon into the theoretical category of “Technology Uncertainty”. Technology uncertainty can be defined as one of the characteristics of technology which signifies perceived unpredictability of future changes in technology. Similarly, the other technology characteristics were emerged from data. Table 2, using data illustrations, has summarized how these five characteristics evolved as theoretical categories.
These five characteristics are: Significance of technology, Challenging technology, Work-life balance, Technology growth potential, and Technology uncertainty. We have discussed them in brief.

5.2.1 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. This theoretical category was identified by the keywords such as ‘good projects’, ‘peer esteem’, ‘better job’ and ‘better opportunities’ as a result of working in a particular technology.

“Technologies that are widely used across organizations have their advantage in terms of better opportunities...it is a cycle, while you work in those technologies you gain experience and expertise and with that experience you tend to get opportunities for more better work and your resume becomes more promising.”

5.2.2 Challenging technology

IT professionals are expected to possess technical competence. They are expected to exhibit inherent interest in technology and for some respondents the challenging nature of job is a source of motivation. This dimension captures the extent of challenge perceived by the IT professionals. Based on themes which emerged from the data, challenge can be expressed as (1) simplicity of tasks, (2) repetition of tasks and (3) extent of personal initiative required.

“I am a part of the team which controls the retail solution for a leading pharmaceutical company of Europe...over past year we have worked on the betterment of the software and the company has reported raise in profit figures after our system installation. Solving problems, fixing bugs...my job last year has given me lots of intellectual satisfaction”.

5.2.3 Work-life balance

This characteristic indicates that technology can exert demand regarding working at odd hours or need to put extra time to work. We observed that most IT professionals are somewhere involved in GSD (King & Torkzadeh, 2008) and have to work in different time zones. Few respondents also quoted another reason of reduced work life balance. They stated that unmatched technical skill and assigned task lead to spending more hours at work while struggling to finish the assigned work. These requirements have direct impact on the work life balance of employees and also create conflicts in leading desired life style.

“My phone rings even at late hours in night, if some technical issue has come up we have to handle it ASAP.”

5.2.4 Technology growth potential

Our data also revealed that IT professionals expect that given technology should enable them to realize their career expectations such as promotions or acquiring high level technical skills. We also found that a technology might be preferred because it allows professional growth in near future.

“My current technology is a niche one...there are very few companies which are working on this but slowly it is getting acceptance in market so I can see my future career prospects are bright”
5.2.5 Technology uncertainty

Technology uncertainty captures the degree of uncertainty in determining the future of a given technology. This theoretical category was described by the respondents as ‘changing technology’, ‘technology updates’, ‘new versions of technology’ and ‘technology obsolescence. It is interesting to discover that some respondents preferred working in continuously changing technology where few shared discontent while working in a technology which is perceived to be highly uncertain.

<table>
<thead>
<tr>
<th>Technology characteristics</th>
<th>Examples and illustration from data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance technology</td>
<td>‘...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.’</td>
</tr>
<tr>
<td>Challenging technology</td>
<td>‘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’”</td>
</tr>
<tr>
<td>Work-Life balance</td>
<td>‘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.’</td>
</tr>
<tr>
<td>Technology growth potential</td>
<td>‘technologies which are crucial to business functions are sought 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.”</td>
</tr>
<tr>
<td>Technology uncertainty</td>
<td>‘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’</td>
</tr>
</tbody>
</table>

Table 2: Theoretical categories and data illustrations

5.3 Person technology fit

Our study found that 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’ preferences and the technology allocated to them. Building on our data and drawing from relevant theories such as PE fit theory; we propose a new construct named ‘Person Technology fit’ (PT fit). PT fit connotes the match between the individual preferences of the employee and the technology given to him/ her (See Observation 3). The PT fit can be determined by the discrepancy between what an individual need and what a technology provides. Based on our data analysis we believe that the perception of fit between the career requirements and the technology allocation might influence the work outcomes of IT professionals.
Observation 2: IT professionals evaluate the suitability (fit) between the technology they are working in and their individual preferences for working in a particular technology.

5.4 Influence on work outcomes

We recorded many statements, which related the evaluated fit or misfit between their individual preference and given technology among IT professionals. Based on our review of PE fit theories we conceptualized PT fit and proposed the linkages between PT fit and work related outcomes. One of the respondent shared that acquiring technical proficiency is important to him to continue with his current job.

“Being a software engineer I expect o get a good technical exposure through my work...tasks don’t require much expertise so I feel I am not acquiring technical proficiency...I am trying to find some better job where I can get good technology exposure”

We also found responses which clearly indicated that dislike for a certain technology can induce intent to leave in IT professionals.

“I often think of quitting, I don’t want to work in SQL server...If I can get some better job somewhere...I want to switch my technology and I am struggling for that right now.. I believe that I will be a better person for Java development...writing java codes was something I was very good at, even in my engineering time”

Career prospects and expected career growth was also reported to be influenced by perceived fit with a technology. Individual differences impacts the way IT professionals evaluate a given technology and perceived outcomes associated with it.

“I don’t consider myself as successful professional, I don’t think this job can give me a fair career growth...I am in a technology which keeps changing and I don’t consider myself as a quick learner...that affects my performance, so future doesn’t seem promising...”

With regard to work life balance, many respondents quoted that are spending considerable amount of time at their work places. There were technology related factors that were leading to outcomes such as amount of effort and time required for completing the assigned task.

“I am tired of doing this work...this technology is very complex...with no help at my disposal, I struggle all day to finish my code...I am not a coding person and just to finish my task I am spending too much time at office”

Observation 3: The suitability (fit) of the technology will affect the work outcomes such as career consequences, intent to leave and work life balance.

6. DISCUSSION AND RESEARCH CONTRIBUTION

The results of the study explore the effect of given technology on work outcomes of IT professionals. Figure 3 represents the process of how a certain technology is allocated and how it impact IT professionals. It depicts that how technology allocation is evaluated by an IT professional and how the process of adjustment influences their work outcomes. Our results indicate that the person technology fit is affected by: (1) Whether the given technology is interfering with their personal lives leading to work life conflict, (2) Whether

1 Perceived proficiency and prior experience with the technology
the given technology is likely to be obsolete causing stress of job loss and professional failure and (3) Whether the given technology provides professional challenge to the IT professional.

Landry and Banville (1992) has expressed that employing qualitative methods such as grounded theory in IS literature can enable the evolvement of the IS field research. Our study works utilizes grounded theory methodology to build on theory that explains a unique phenomenon in IS research. Minger (2001) in his work, while analyzing the recently published work in leading IS journals advocates use of methodology such as grounded theory. We have redefined the technology characteristics and thus contribute to better understanding of various aspects of technology as perceived by IT professionals.

Findings of the present study have implications for both industry and academia. The present study tried to contribute by highlighting the importance of technology allocation on IT professionals’ work outcomes such as perceived career prospects and turnover intention. Further, the present paper contributes to the literature of PE fit by establishing PT fit as an important phenomenon to address an important yet neglected issue in IS literature.

Figure 3: The process of individual level assessment of Person Technology fit.
Appendix A

Diagrammatic illustration of data analysis using grounded theory

Appendix B

Compilation of technologies our respondent reported to be working on

1. Java technologies (EJB, Struts)
2. C#, .net
3. Database management such as oracle, SQL server
4. Support
5. Testing tools, white box, black box testing
6. Business Object
7. SAP/Oracle
8. Mainframes
9. Sharepoint
10. ADG tools
11. Unix OS
12. Web technologies
13. Data mining, data analytics tool
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