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# Exploring the perceptive effect of technology allocation on work outcomes among IT professionals

**Gunjan Tomer**

*Assistant professor, Institute of financial management and research, Chennai, India*

*Email :f10gunjant@iimidr.ac.in, gunjanfeb29@gmail.com*

**Abstract**

Considering intensive interaction with technology, the effect of technology allocation on IT professional's work outcomes should not be ignored. Our study thus tries to explore the interplay of technology characteristics and individual factors which in turn will influence the job outcomes. Theoretical model proposes that certain technology level factors like market dominance, intellectual challenge and work hour requirements interacts with individual level factors such as growth need, competence and need of life style integration to affect job responses like commitment, burnout and motivation. Using qualitative approach this study attempt to explicate the person-technology fit in an IT organization context.

Keywords: Technology allocation, IT professionals, technology characteristics, India

## 1. Introduction

With growing IT industry and demand for IT professionals, ample amount of research is ensued to explain behavior of IT professionals with respect to various constructs like their motivation, job satisfaction and turnover intentions. The IT industry exhibits higher attrition rate and reports higher stress level in comparison to the other industries (Joseph et al., 2007), thus, conferring focus to study the behavior of IT professionals in order to explain the higher levels of attrition and lower job satisfaction.

It has become essential to understand the intrinsic factors that lead to work outcomes. Ginzberg and Baroudi (1988) indicated that most studies of IS personnel have centered on external factors, thus undermining the importance of individual level intrinsic factors. One of the significant frameworks to understand the relationship between individual level factors and work outcomes is person environment fit model (Edwards, 2000). The concept of fit or congruence between individual attributes and the characteristics of a situation has long been an important explanation for differences in individual performance and satisfaction at work (Weiss et al., 1967). This study, thus, focuses on micro or individual level factors (Igbaria *et al,* 1991) and their interaction with the situation related factors to provide a better understanding of IT professional's behavior.

IT professionals spend most of their time dealing with the technology they are working on. The various impacts of prolonged exposure to technology are discussed in literature like technostress (Tarafdar et al., 2007). There are various challenges that IT professionals face in order to sustain their work existence. One of the challenges faced by IS developers is the constant change in technology. This exposes them to considerable job stress and fear of obsolescence (Pazy, 1994). So there are ample evidences in literature concerning the effect of technology on individuals. This can be the ground for inferring the existence of the interplay between individual and technology.

Fulfillment of need is central to intrinsic motivation (Ryan, 1995). This 'need' varies from person to person. It is important to create a fit between need and provides. Holland (1985), for example, argued that satisfaction and performance are enhanced when the individual selects an occupation that is compatible with his or her traits and skills. On the other hand the technology allocation in IT organizations is based on business requirements. However, since technology

characteristics vary (Ayyagari et al, 2011), it is possible that suitability of technology allocation may get affected by individual level characteristics. This study attempts to explore the possibility of a "fit" between person and technology that will affect work related outcomes.

## 2. Research motivation and identifying the problem

The information technology industry in India draws attention for various reasons. In the last 14 years the contribution of IT industry to Indian GDP has grown up from 1.2 to 7.5 percent. Global share of the market has also risen from 51 percent in 2009, to 58 per cent in 2011. This considerable growth has also impacted labor markets and in India, IT industry continues to be a net employment generator, thus providing direct employment to about 2.8 million, and indirectly employing 9 million people (NASSCOM, 2014). The significant demand of trained professionals influences the career decisions making process (Bai, 1998). Thus we can infer that individuals joining this profession have a distinct range of aspirations, career orientation and professional and non professional alignments. This leads into difficulties in human resource management of IT professionals. A series of studies of the key issues facing IT professionals have consistently listed human resource management as a leading key issue (e.g. Niederman, Brancheau, and Wetherbe, 1991).

Existing theories like dual Ladder career theory also ignores the possibility of different individual orientations and aspirations. The dual ladder theory suggests two ladders for career progression: technical career path and managerial IS career path (Allen & Katz, 1986). However, the literature suggests that it is not a very appropriate way to cater to the intrinsic needs of an individual as it is only categorizing individual orientation into two segments, though many other career orientations may also be possible, yet these are ignored in the dual career model (Baroudi, 1998). Element of effective management of IS professionals involves satisfying employees' career values and aspirations (Greenhaus & Callanan, 1994). These aspirations are related to growth needs and future career management (Schein, 1978).

To elaborate on this our work primarily focuses on finding out how technology level properties affect the work behaviour of IT professionals and what are the conditions under which this relationship is likely to be most favourable for the work outcomes..

## 3. Review of literature

We have borrowed from various relevant theories available in literature to derive a primary understanding of individual fit with the allocated technology. Brief description of these theories which explicates the person technology fit is presented below.

### *3.1. Job characteristic theory*

The job characteristics model examines individual responses to jobs as a function of job characteristics moderated by individual characteristics (Hackman & Oldham, 1975). This theory can be extended to understand interaction between technology characteristics and individual characteristics and its impact on job responses. Roberts and Glick (1981) applied job characteristics approach for task design to draw attention to different perspectives required while designing jobs. They also insisted that future task design should consider both situational and individual cognition in different organizational contexts. In a way we are trying to inculcate a contextual perspective to suggest that technology allocation largely influence the job situation of an individual and it will be wise to consider a co-ordination between both.

### *3.2. Within person dimension*

This dimension examines individual level factors that determine the fit with the designated task. One of the possible factors can be absorptive capacity, which can be defined as the effect of prior learning experience on subsequent learning tasks can be observed in a variety of tasks (Cohen et al, 1990). This dimension tries to capture individual level aspirations and beliefs which play a role in career related decisions (Schein, 1978).

### *3.3. Person job fit*

Person-job fit ensures productivity as it allows appropriate selection of person for the chosen job. IT employee's job mainly involves their interaction with certain technologies of their domain. The technology contributes to the job characteristics so the fit should be established between the person and the technology assigned. Lewin (1951), for example, illustrates the dual focus in his statement that "behavior (B) is a function (F) of the person (P) and of his environment (E), B = F (P, E)" (p. 239). Extending this relationship to behaviour of IT professionals it can be asserted that the behaviour can be predicted on the basis of integrated function of their work and job environment and individual factors.

### *3.4. Technology characteristics*

Technology level characteristics are discussed in literature in different contexts. For instance, one of the studies in manufacturing technology context relates technology characteristics like radicalness and complexity with quality of learning and project success (Aiman-Smith & Green, 2002). The possible technology characteristic, for instance generic or niche technology can be associated with the probability of technology extinction which in turn can create anxiety and stress (Pazy, 1994). In the present study we define technology as a set of tools, platform and skill required to perform the role of an IT professionals. In the similar way technology character tics are the features of the technology which act as a ground

for IT professionals to understand and evaluate a given technology.

### *3.5. Professional identity*

Professional identity plays an important role in determining profession orientation of individuals. Individual with a non professional orientation primarily derives job satisfaction and motivation from organization level and economical factors rather than work related factors (Hall et al., 2002). Subsequently we can compare and contrast the behaviour of employees who possess professional and non professional orientations. Based on the existing literature we propose that the relationship between technology fit and job outcomes would be moderated by professional identity.

## 4. Methodology

As the person technology fit construct in the given context is not defined in existing literature, we employed an exploratory study to gain an understanding. The respondents of our study were working professions from leading IT service firms operating in India. The responses were taken from three categories of respondents to understand the phenomenon from various perspectives. Interviews were conducted which expected respondents to respond to a semi structured questionnaire. In addition to this few open ended questions were also asked to ascertain coverage of all relevant dimensions. We have observed data saturation after conducting 31 interviews across all three categories.

*Category1:* Entry level professionals who are having six months to two years experience of working in an IT organization. The technology allocation at initial level occurs in first six months so there is a possibility of observing job related outcomes.

*Category2:* Human Resource and Project manager who are responsible for resource allocation across various projects.

*Category 3:* IT professionals having more than two years of experience preferably in the 2-6 years bracket. It is being observed that employees having greater than six years of experience are mostly promoted to managerial positions.

## 5. Data Analysis

Data was analyzed in a recursive manner where data categories emerged from categorizations of narratives, opinions and perceptions. Data narratives describing similar phenomenon were classified together to form theoretical themes of the data. Further data analysis helped in abstracting categories into broad theoretical dimensions.

Table 1: Demographic details of the respondents

| Demographic detail | Category | Number of respondents |
|---|---|---|
| ***Age*** | 24-28 | 10 |
| | 28-32 | 15 |
| | 32-36 | 6 |
| ***Gender*** | Male | 11 |
| | Female | 20 |
| ***Years of experience*** | 0.5-2 years | 12 |
| | 2-6 years | 19 |
| ***Professional role*** | IT professionals | 25 |
| | HR professionals | 6 |
| Total number of respondents | | **31** |

### *5.1 Theoretical themes category 1*

#### ***5.1.1.*** *Technology/project allocation process*

The respondents in this category were in their first two years of service. The objective was to understand the influence of initial level technology allocation on employee's career management and job outcomes. It was mentioned by many respondents that prior experience in the technology plays an important role in future project allocation so initial level projects and technology trainings affect the opportunities both inside and outside organizations.

#### ***5.1.2.*** *Industry/domain verticals or Industry service units*

The entry level IT professionals are categorized under the technology skill set and industry verticals. These domains referred as domain verticals or industry service units in different IT organizations are basically Industries these IT organizations are serving few of them are Retail, Pharmaceuticals and Banking. So the initial level training concentrate on developing both technology level and domain level skill sets in new joined IT professionals. We have collected data from three top Indian IT organizations and they follow the similar processes for project and technology allocation.

#### ***5.1.3.*** *Difference in smaller and larger firms*

To understand the allocation process we also collected data from few US based companies which are operating in India in small scale business and cater to niche segments. We noticed that these firms differ from larger IT Indian organizations in recruitment processes. These companies have clearer understanding of required technology skill sets and they mostly hire for specific projects. One of the respondents from a small Hyderabad based firm quoted,

> *"...we (the organization) work for a specific set of clients and the technologies and tools are not very generic. I was hired for a mobile app development project and the project details were provided at the time of pre placement talk. That usually doesn't happen in larger firms where the pool of tools and technologies and project is much wider."*

#### *5.1.4. Dissatisfaction over technology allocation*

The perception that initial career contributes primarily in shaping and progression of your future career builds up insecurity in IT professionals, especially in those who are not allotted a favourable technology or domain. This phenomenon was strongly observed in this category of respondents as technology allocation and initial training are conducted in first few years of the job.

#### *5.1.5. Concerns regarding non challenging job, career management, identity crisis*

When asked that whether they have a choice to work on a technology or project that are more suitable to self skill set, respondents mentioned that denying projects is a risky proposition. They shared insecurities regarding inclusion in "on-bench" or "free pool" resource. When asked about flexibility in choosing technology to work in, they commented that a reasonable choice is to accept projects coming in way as only two projects can be declined on the basis of skill compatibility.

One important observation was that this set of respondents was more worried about opportunities inside the organization. Internal career management was emerging prominently. We suppose that two years service bond that they need to sign on acceptance of job offer might be the cause behind this. External career is not a concern presently but many respondents expressed their intention to quit for better opportunity.

Another interesting dimension was of professional identity. We observed respondents with strong identification with the profession were more upset if the technology allocation was not suitable to them. However respondents who were exhibiting weaker sense of identity were deriving their job satisfaction with other factors like organizational factors, salary and stability.

> *"...this work makes me feel as if I am doing a clerical job...I sometimes feel that my professional qualification is so much underutilized in my present work responsibilities"*

### *5.2. Theoretical themes category 2*

We conducted semi structured interviews on HR professionals at leading software firms. The objective was to understand the recruitment and task allocation in major firms. The respondents explained the process of recruitment and technology allocation which helped us to understand the organization perspectives behind technology and project allocation in employees. The responses were very interesting as they demonstrated that how individual factors are disregarded in the processes.

#### *5.2.1. The recruitment process*

The recruitment process for IT professionals is conducted at two major levels campus or fresher recruitment and lateral recruitments. Where campus placements are conducted to induct fresh engineering graduates as entry level software professionals, lateral placements are driven for experienced technocrats. Respondents also mentioned that these recruitments are basically business driven and are initiated by the technology heads. The department heads prepare KRAs or key responsibility area to enable hiring of appropriate human resource. That is then transferred to appropriate recruitment team to drive the hiring process.

> *"It is true that at the time of recruitment drive which employee will work for what project is not decided...it is the job of technical heads. We are given KRAs and we hire as per the skill set required for that particular position."*

#### *5.2.2. Hire for company*

This is a very interesting phenomenon as it provides the background of the person technology fit problem. The "hire for company" process as named by one of the respondent refer to the recruitment process where business requirements are driving the hiring process and at the time of recruitment the particular project and technology requirements are often not known. This is most often in the case of campus placements.

> *"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 for projects."*

#### *5.2.3. Business driven allocation*

When respondents were asked about technology or project allocation among employees, they mentioned that the process is basically requirement driven. The resource pool is referred while allocating the project to assess the suitability of the employee and then as per the client's contract projects are assigned. This process was confirmed by respondents of other categories also.

#### *5.2.4. Product based vs. Service based firms*

We observed a general discrimination in the hiring process of product and service based IT firms. The product based companies have a very clear objective of their human resource requirement and they hire for specific projects and technology skill set. On the contrary the service based firms hire in anticipation. The projects they are working on vary on a wide set of technology skills where resource transfer from one technology to another is normal practice. So the technology skill set requirements are majorly anticipative and consider the requirement of their future projects. As we have already discussed, this difference was also observed across small and large size of IT firms.

### *5.3. Theoretical themes category 3*

#### *5.3.1. Career management and professional growth*

Most of the respondents share their concern about technology and project allocation and there were many who were not

satisfied with their current technology or projects. We observed job dissatisfaction and lack of commitment in those respondents. Predominantly their responses were surrounding the major issue of career management, both at internal and external level. As we understood the technology characteristics (as explained in the next section) impacts the opportunities available both inside and outside organization, thus influencing the career satisfaction of the employees.

#### *5.3.2. Supervisor support and referrals*

Some of the professionals also shared their experience of changing their technology which was unrelated to their prior exposures, as they perceived that technology suited to their needs and aspiration in a better manner. They commented that for internal transfer it is very important to have supervisor and managerial support which helps in landing in preferable projects. Even for external opportunities referrals and network helps.

#### *5.3.3. Work life balance*

As defined in literature WLB 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. As these category of respondents have higher work experience their life stages often conflicts with their demanding work life. Most of the respondents were married and had kids at their home. They have to work according to the clients working hours and because of time difference they often end up staying in offices in odd hours. Few of the respondents often mentioned that work from home however helps in overcoming commuting issue, the odd hour calls and conference meeting has to be attended and this kind of work interferes with their normal family life.

#### *5.3.4. Technology characteristics*

Based on the interview responses from all the respondents we were able to segregate some unique technology characteristics that interact with individual level career orientation and cause positive and negative job outcomes depending on the resulting fit. We have described each in brief.

***Market dominance***

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

***Intellectually challenging***

The job of IT professionals mostly comprises of technical content. They have inherent interest in technology and for few the challenging nature of job is a source of motivation. They enjoy winning against unsolvable and critical problems and that gives that both job and career satisfaction. Few technology and projects provides the opportunity of crossing difficult barriers but rest of them involves routine work. So the fit is expected to get desired job outcomes.

***Work-hour requirement***

This characteristic indicates the nature of technology which demand work at odd hours. Predominantly domains like support functions, development and maintenance require employees to work according to US/UK shifts. Considering the current landscape of IT organization most IT professionals are somewhat involved in globally distributed system development (King & Torkzadeh, 2008). These requirements have direct impact on the work life balance of employees and also lead to conflicts in desired life style integration.

> *"...if you are working in support function you are required to work in late hours...the maintenance work and bug fixing can come anytime so attending calls even at home is expected."*

***Growth potential***

Incentives like onsite opportunities and probability of getting promotions make a technology more lucrative. Although this factor is much related to market dominance of the technology we encountered few responses where niche technology was preferred because of its perceived growth in near future.

***Life of technology***

The extinction of technology is often faced by IT professionals. This contributes in the higher level of job insecurity among IS professionals. Therefore they face constant requirement to learn and update their knowledge base. This might negatively affects individual with higher need of security and stability.

## 6. Results and Theoretical framework

Our analysis of data suggested the interaction of technology and individual factors which lead to work related outcome. At individual level concern regarding career management appeared to be the foremost factor. The job outcomes like career satisfaction and commitment were basically influenced by career orientation of IT professionals. Derr and Laurent (1987) and Schein (1987) both argue that career concepts developed in the USA may not be transferable to other countries. It is suggested that countries as cultural settings would vary in the degree of prestige they assign to different career paths, which, in turn, would lead to variations in how employees in different cultural units perceive and feel about their careers. As data has suggested, Indian recruitment and job allocation is business driven rather than career orientation driven. In our study we are trying to understand how individual orientation of IT professionals interacts with task (technology) allocation.

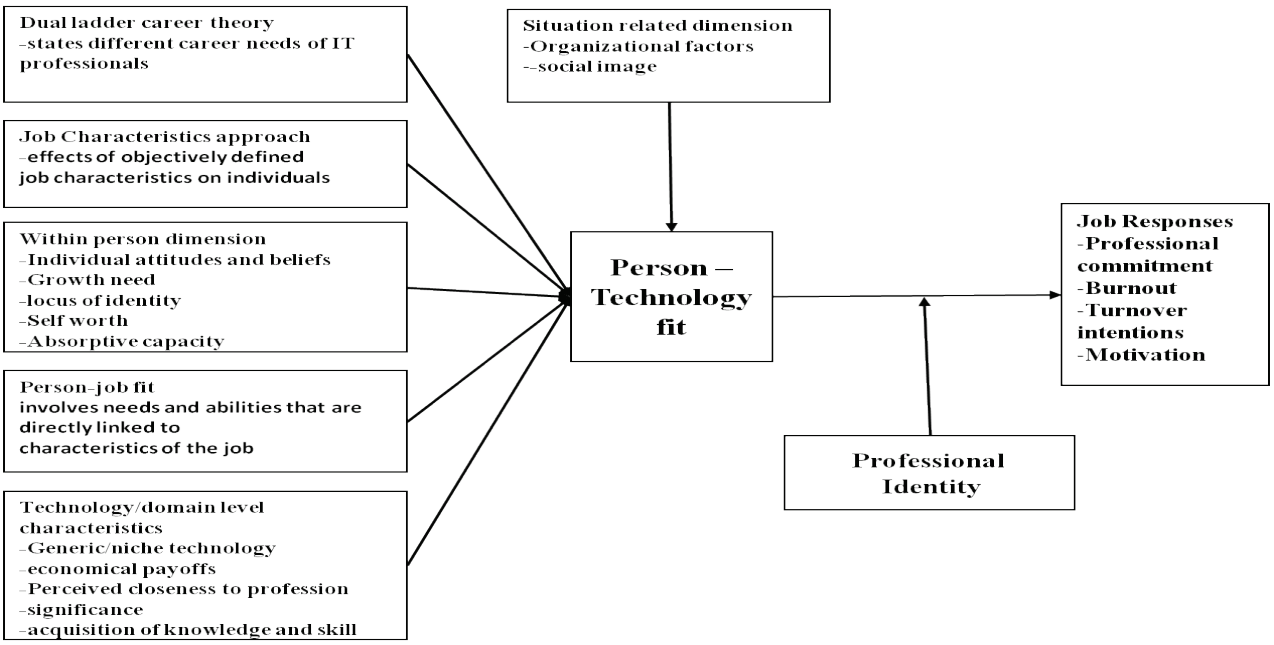


**Figure 1: Theoretical framework**

As the IT industry is dynamic and technology up gradation and extinction is fairly accepted practice, job security was observed to be lower in the respondents. The career orientation like growth need affect their satisfaction with the allocated technology and assigned task. Another interesting observation was intermediary role of professional identity. Respondents who strongly identified themselves with the profession were more concerned about the project and technology allocation rather than respondents with lower levels of professional identification. These respondents derived satisfaction from organization level factors like monetary incentives and employee benefits.

Figure 1 illustrates the theoretical framework which presents theoretical grounding behind person technology fit and also suggests its relationship with job responses.

## 7. Research contribution and implications

The results of the study elucidate the effect of technology allocation on job responses of IT professionals. This kind of study has not been done on IT professionals. Also most of the studies are conducted on IS professionals who work in IT function of organizations; we are here studying IT professionals working in major software firms working in various software development phases.

### *7.1. Implications to the practise*

The findings have implications on HR allocation in software projects. Our study highlights the need of major change required in HRM of IT professionals. The person-technology fit is expected to influence various outcomes like professional commitment, burnout, motivation and turnover intentions. As Coopers and Lybrand indicated that qualified and skilled computer professionals are most difficult to find, it is essential that IT organizations make sufficient effort to provide a positive work environment in order to retain and motivate the current professionals (Mone, 1994).

### *7.2. Implications to the theory*

The study also contributes to job characteristics and task design literature by explicating interaction of technology level characteristics and individual factors. This study thus offers explanation on "within person" and "person-situation" dimension of job characteristics theory. This work maintains distinction between both the dimensions by observing both factors distinctively but focusing on the interaction of both dimensions. The situational factors that will strengthen the effect of technology allocation on work behaviour are analyzed so that specific strategies can be suggested to redesign technology allocation method in IT organizations. The findings can also be employed for internal career management of IT professionals.

## 8. Limitations of the study

The present study explores the phenomenon at the ground level and attempts to understand the process behind individual evaluation of given technology. The findings present in-depth insights on how individual perceive technology allocation.

The study thus focuses on explaining the phenomenon on rather than offering generalizable findings. Addressing the generalizability issue, our study is conducted in Indian IT organizations context however transference of findings can be established if sufficiently similar economies and circumstances are taken (Lincoln and Guba 2002). The current study is attempting to provide naturalistic generalizability so it should not be evaluated for its statistical applicability. Also, further researches can shed more light on impact of technology allocation on other significant outcomes as well. Further researches can be done to analyze the statistical validity of the relationship proposed, possibly based on measuring individual attitude and interaction effect of it with technology characteristics resulting in job outcomes.

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