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Employers' Perception on the Predictors of Graduate Employability in Information Technology Sector

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Abstract

Purpose: *This research paper aims to analyze the perceptions of the employers in the Information Technology (IT) sector in India on the predictors of graduate employability. With the rising "employability gap" being witnessed by this sector, seeking and developing an employable workforce has been a challenge for majority of the recruiters. The significant factors that influence graduate employability in the IT sector have been identified through a conceptual review of literature. Further, this study aims to investigate the perceptions of one of the key stakeholder groups, i.e. employers, on these identified predictors of employability and empirically validate the relationship between the research constructs.*

Design / Methodology/ Approach: *The predictors of graduate employability in the IT sector have been identified through the qualitative analysis of the available literature. A preliminary validation of these predictors is conducted through Total Interpretive Structural Modeling (TISM), a qualitative modeling technique. Further, this study is empirical in nature that measures the perceptions of the employers on the identified predictors of employability through opinion surveys. Questionnaires are used to elicit responses from a sample of 236 respondents,i.e. technical / HR personnel at the middle level / upper middle level management positions spanning across 71 reputed IT companies in India. These respondents are activelyinvolved in the recruitment and selection of fresher graduates. The perception of the employers is analyzed using bivariate and multivariate analysis techniques.*

Findings: *The perception of the employers is captured on all the identified predictors of employability. These include the three macro variables and six micro variables of study (independent variables) that are deemed to influence employability (dependent variable). All these identified predictors are perceived significant by the employers, however, it is found that the level of significance for employability attached to these variables is different. At the macro level, technical skills and personal and interpersonal skills are found to be more significant for employability than organizational knowledge. At the micro level, technical specialties knowledge has a stronger influence on employability as compared to technology management skills. Furthermore, in context of the micro variables of personal and interpersonal skills, problem solving and critical thinking skills are considered most important. An analysis of the controlled impact of variables, i.e. when all the micro variables are taken together, highlighted the relatively greater importance attributed to technical specialties knowledge and also the insignificance of creative thinking skills for the employers.*

Originality / Values: *The questionnaire design and further empirical investigation conducted to analyze the perceptions of employers on the antecedents of employability is an original contribution and has not been published in any academic journal.*

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Research Implications and Limitations: *The findings of this study are expected to help the graduates seeking jobs in the IT and allied sectors and the higher education institutions offering academic programs in this domain. These findings would enable them to better understand the predictors of employability and focus on developing those factors that are deemed to be crucial and decisive by the recruiters.Opinion surveys have been used in this study to analyze the perceptions of the employers. There fore, there might exist a possible bias in the responses.*

Keywords: Employability, Employability gap, Employer demands, Information Technology sector,Skill deficit, Skill gap.

1. Introduction

The graduate recruitment scenario has witnessed fundamental shifts in the recent times wherein the term "employability" has gained a crucial significance. It can be conceptualized as the set of knowledge, skills and personal attributes that enhances an individual's ability to gain and maintain employment. The factors like globalization, technological changes and increased market competition have prompted the employers to hire "work ready" graduates who can transit from higher education institutions to the world of work efficiently and seamlessly. Hence, it has become imperative for these job seeking graduates to couple their academic degrees with vital skills and attributes that make them employable for the job market and meet the rising talent demands of the recruiters.

Though employability of graduates is rather crucial, however, India is facing rising skill gap, talent crunch and demand supply mismatch across many sectors of its economy. This gap is found to be more dominant in the Information Technology (IT) sector. The IT sector has made an unparalleled impact on the Indian economy. However, the sector is striving to deal with the challenges of employability gap and talent supply mismatch to maintain its global leadership position. It has been observed that the dynamic nature of the IT sector and the changing demands of the employers are further widening this gap. Therefore, it becomes imperative to understand the paradigm change in the perceptions of the recruiters in the IT sector. The National Association of Software and Service Companies (Nasscom, 2012) reports that employability is a crucial challenge being faced by India in general and the IT sector specifically. Nasscom (2014) reports that there exists an oversupply of talent and low employability in the IT sector in India. The research study indicates that that of the~0.6-0.64 million candidates willing to work in the non-business process management sectors (IT Services, Software Products and Engineering and R&D), around 0.15-0.18 million are deemed employable.

In context of this rising skill gap, perception and expectation gaps have been reported by various research studies. The differences in perceptions exist both in general and in the context of IT sector. Wickramasinghe and Perera (2010) compared the perceptions of graduates, university lecturers and employers in Sri Lanka on employability skills and found differences in the priorities given to the various employability skills by these stakeholders. Dupre and Williams (2011) identified a gap in the skills employers seek and students' perceptions of their abilities in those areas in US context. With a focus on IT/ IS sector, Lee et al (2002) found that there are significant perception gaps between IS academics and practitioners in terms of the required skills. Lowry and Turner (2003) also report gap in the perceptions and aspirations of IS graduates and employers. Trauth et al (1993) observed gap between the needs of the industry and the abilities of the graduates through the data collected from IS managers, IS consultants and IS professors. Highlighting these perception gaps, McMurtrey et al. (2008) indicated that understanding the skill set expected from IT personnel is an important endeavor for both companies and academic or training institutions alike. Because of the dynamic nature of this

sector, technology and the IT practices change at a fast pace, and in turn, this alters the skills required from IT professionals. As companies invest huge resources in training personnel, particularly the new IT employees, it is important for the educational institutions to understand the changing needs of the employers in order to plan an effective curriculum.

In view of the perceptual differences between the key stakeholder groups on the predictors of employability, it becomes imperative to measure the perceptions of these stakeholders and further understand the gaps between them. Such an analysis aims to reach the ground roots of "perceptions" in order to explore the employability gap that stems out of it and examine its nature and cause rather than scanning this issue at the surface or macro level. With this backdrop, this study aims to capture the perceptions of one of the key stakeholder groups i.e. employers, on the employability skills deemed significant for graduates in IT and allied areas. The conceptual model of research drawn from the conceptual review of literature has been empirically validated from the standpoint of employers and their perceptions on the predictors of employability have been captured and further analyzed.

2. Predictors of Graduate Employability in Information Technology Sector

A conceptual model of the predictors of employability in IT sector proposed by Sehgal and Nasim (2017) has been used to capture the perceptions of the employers on the factors that influence employability. This model isbased on the qualitative review of literature encompassing general employability studies, the well-grounded models of employability and the research studies specific to IT and allied sectors. The model depicts that the three macro variables (independent variables) i.e. Technical Skills, Organizational Knowledge and Personal and Interpersonal Skills are deemed to influence employability (dependent variable). These macro variables further consist of micro variables. The model as proposed by Sehgal and Nasim (2017) as shown in Figure 1 illustrates the possible linkage of the independent variables (predictors of employability) with the dependent variable-employability.

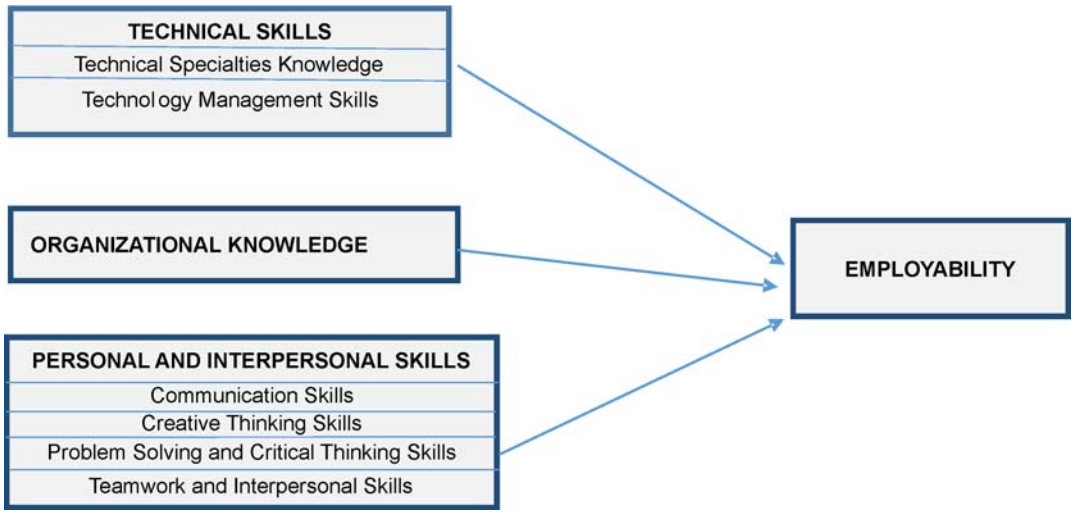

Figure 1: Conceptual model of research

Note: Adapted from "Predictors of graduate employability in Indian information technology sector" by Sehgal N. and Nasim, S., 2017, Int. J. Human Resources Development and Management, , Vol. 17, Nos. 3/4, pp.247–265. , Copyright 2017 by Inderscience

Table 1: Macro and Micro Variables of Research

Macro Variables	Micro Variables	References
Technical Skills	Technical Specialities Knowledge	Lee et al. (1995)
	Technology Management Skills	Nelson (1991), Trauth et al. (1993), Yen et al. (2001), Lee et al. (2002), Aasheim et al. (2009, 2012),
Organizational Knowledge		Nelson (1991), Yen et al. (2001), Bassellier and Benbasat (2004), Fang et al. (2005), Aasheim et al. (2009)
Personal and Interpersonal Skills	Problem Solving and Critical Thinking	Yen et al. (2001), Lee et al. (2002), McMurtrey et al. (2008), Tesch et al. (2008), and Wickramasinghe and Perera (2010)
	Communication Skills	Lee et al. (1995), Woratschek and Lenox (2002), Fang et al. (2005), McMurtrey et al. (2008), Tesch et al. (2008), Aasheim et al. (2009), ,Eom and Lim (2012)
	Creative Thinking	Yen et al. (2001), Lee et al. (2002), McMurtrey et al. (2008),Tesch et al. (2008), Wickramasinghe and Perera (2010), and Aasheim et al. (2012)
	Team Work and Interpersonal Skills	Teamwork skills: Woratschek and Lenox, (2002), Fang et al. (2005), Bailey and Mitchell (2006), McMurtrey et al. (2008),Tesch et al. (2008), Aasheim et al. (2009, 2012), and Interpresonal skills: Nelson (1991), Trauth et al. (1993) , Bassellier and Benbasat (2004), Aasheim et al. (2012), Rosenberg et al. (2012),
Employability		Hillage and Pollard (1998), Harvey (2001), Australian Chamber of Commerce and Industry and Business Council of Australia (2002), Fugate et al. (2004),Heijde and Van der Heijden (2006), Dacre Pool and Sewell (2007),Fugate and Kiniki (2008), Bridgstock (2009)

Further, the macro and micro variables in the research model are illustrated below:

Note: Adapted from "Predictors of graduate employability in Indian information technology sector'" by Sehgal N. and Nasim, S., 2017, Int. J. Human Resources Development and Management, , Vol. 17, Nos. 3/4, pp.247–265. , Copyright 2017 by Inderscience.

The conceptual model of research drawn from the literature was further subjected to preliminary validation using Total Interpretive Structural Modeling (Nasim, 2011; Sushil, 2012), a qualitative modeling technique. For this purpose, in depth interviews were conducted with domain experts in the IT sector to solicit their inputs on the subject and deriveastructural model of the predictors of employability. These include senior middle management professionals in reputed IT companies in India with expertise in the area of recruitment and selection of technical graduates.Eight elements were subjected to Total Interpretive Structural Modeling (TISM) including the dependent variable "employability" and the seven independent variables i.e. the two micro variables of "Technical Skills", the four micro variables of "Personal and Interpersonal Skills" and the variable "Organizational Knowledge" as it does not consist of further micro variables. Based on the opinion of the domain experts,these elements were hierarchically modelled into four levels.

Through this qualitative modeling technique, the research variables identified earlier through the conceptual review of literature were validated at the preliminary level.All the seven identified factors were endorsed by the industry experts as the drivers of employability. Further, some of the key factors affecting employability emerged to be technical specialties knowledge, technology management skills and communication skills.An innovation to the TISM by way of validating the developed model through the feedback from domain experts has been introduced to the TISM technique by Nasim (2011). The developed TISM model has been further validated through assessment surveys with a larger set of domain experts to enhance the credibility of the obtained results. The preliminary validation of the research variables through TISM sets forth the stage for further empirical validation.

3. Research Methodology

This study is empirical in nature that intends to capture the perceptions of employers on the predictors of graduate employability in the IT sector. Opinion surveys are used to collect data from recruiters in the IT sector in India. These surveys on one hand, measure the perceptions of the employers on the antecedents of the employability and on the other hand, empirically validate the relationship between the research constructs as proposed in the conceptual model of research from the standpoint of employers. Statistical Package for Social Sciences (SPSS) is used for the statistical analysis of the collected data. Hypothesis of association formulated for further investigation have been tested through correlation and regression analysis techniques.

4. Hypotheses Formulation

The hypotheses of association have been envisaged to capture the perceptions of employers. These have been formulated as below:

Hypotheses of Association for Macro Variables

Null Hypotheses: One macro independent variable is not a predictor of the dependent variable

Alternate Hypotheses: One macro independent variable is a predictor of the dependent variable

This is elaborated below:

HATE: Technical Skills are predictors of Employability

HAOE: Organizational Knowledge is predictors of Employability

HAPIE: Personal and Interpersonal Skills are predictors of Employability

The summary of the hypotheses for macro variables is presented in Table 2

Table 2: Summary of Hypotheses for Macro Variables

Independent Macro Variable	Associated with Variable	Hypotheses Code
Technical Skills	Employability	HATE
Organizational Knowledge	Employability	HAOE
Personal and Interpersonal Skills	Employability	HAPIE

Hypotheses of Association for Micro Variables

Null Hypotheses: One micro independent variable is not a predictor of the dependent variable

Alternate hypotheses: One micro independent variable is a predictor of the dependent variable

Based on the same, the alternate micro hypotheses with Technical Skills Factor may be formulated as follows:

HAT1E: Technical Specialties Knowledge (T1) is a predictor of Employability

HAT2E: Technology Management Skills (T2) is a predictor of Employability

The alternate micro hypotheses with Personal and Interpersonal Skills Factor may be formulated as follows:

HAPI1E: Problem Solving and Critical Thinking Skills (PI1) is a predictor of Employability

HAPI2E: Creative Thinking Skills (PI2) is a predictor of Employability

HAPI3E: Communication Skills (PI3) is a predictor of Employability

HAPI4E: Teamwork and Interpersonal Skills (PI4) is a predictor of Employability

The summary of hypotheses for micro variables is depicted in Table 3

Table 3: Summary of Hypotheses of Association for Micro Variables.

Independent Micro Variable	Associated with Dependent Variable	Hypotheses Code
Technical Specialties Knowledge	Employability	HAT1E
Technology Management Skills	Employability	HAT2E
Problem Solving and Critical Thinking Skills	Employability	HAPI1E
Creative Thinking Skills	Employability	HAPI2E
Communication Skills	Employability	HAPI3E
Teamwork and Interpersonal Skills	Employability	HAPI4E

5. Questionnaire Design and Pretesting

The questionnaire for the opinion survey of employers has been designed using the Likert scale to capture the perception of the respondents and test the hypotheses of association listed in the preceding section. The respondents were asked to indicate the level to which they agree or disagree with the listed statements in the questionnaire using a five point Likert scale. These statements recorded the perceptions of the respondents on the importance of various skills / knowledge areas that are deemed crucial for employability. To enhance the clarity of the designed questionnaire and avoid ambiguity, the questionnaire has been pre-tested using Questionnaire Appraisal System (QAS) developed by Research Triangle Institute. Cronbach Alpha has been used to measure the reliability. The value of Cronbach alpha is high (greater than 0.9) for all macro and micro variables indicating high reliability. Validity of the designed questionnaire has been tested through Exploratory Factor Analysis (EFA). Factor loading for all items was found to be greater than 0.6 and hence none of them was dropped. KMO index was found to

be greater than 0.5 for all macro variables and the significance value for Bartlett's test of sphericity is 0.000 for all macro variables. The values of univariate statistical analysis were all found within range and data was normally distributed.

6. Sample Design

The designed questionnaire was administered to the employers in IT sector that recruit graduates for technical jobs. The employers chosen for this study largely include NASSCOM member companies in Delhi / NCR region. Amongst the others, these include top IT companies that employ a vast majority of the workforce. Data was collected from HR personnel / technical staff at the middle level / upper middle level positions that are involved in the recruitment and selection of technical graduates. It is quite evident that the population for this group is very large and thus was assumed unknown. Response from a sample of 236 respondents from across 71 reputed IT companies has been elicited for this study. The chosen sample size is justified from the perspective of statistical techniques used in this study. The method adopted for sample selection has been a combination of judgmental, convenience and snowball sampling techniques.

7. Findings

The data collected through the opinion surveys has beenanalyzed using correlation and regression analysis techniques.The following sub sections discuss the results of the same.

8. Results of Correlation Analysis

Analyzing the relationship between the dependent and independent variables of study at the macro level, it can be noted from the results of correlation analysis depicted in Annexure Ithat the coefficient of correlation is greater than 0.7 for all macro variables. The strongest association is exhibited by Personal and Interpersonal Skills (.84) closely followed by technical skills (.83) and Organizational Knowledge (.78). Hence it can be concluded that all independent macro variables bear a strong positive correlation with the dependent variable of study i.e. employability.

With regard to the micro variables of Technical Skills, it can be noted that Technical Specialties Knowledge bears the strongest relationship with employability (.805) closely followed by Technology Management skills (.795). Also, in the category of Personal and Interpersonal Skills, Communication Skills (.735), Problem Solving and Critical Thinking Skills (.775) and Teamwork and Interpersonal Skills (.795) exhibit strong relationships with employability. Further, the multi collinearity test (Annexure III) indicates that VIF (Variance Inflation Factors) is well within the acceptable range (<10).

9. Results of Regression Analysis

The results of regression analysis have been discussed in the sub sections below.

Regression Analysis for Macro Variables

It can be noted from the results of regression analysis for macro variables (Annexure II) that the coefficient of determination, R square, for the independent macro variables is .755. This shows that 75.5% of the variation in employability can be accounted from the variability in the independent macro variables. The results indicate validation at 95 percent. The beta values of Personal and Interpersonal Skills (.354), Technical Skills (.349) and Organizational Knowledge (.210) are all found significant.

Regression Analysis of Micro Variables

The results of the regression analysis of the micro variables are discussed below.

Regression Analysis of Technical Skills

It can be noted from the regression analysis results for the micro variables of Technical Skills (Annexure II) that the coefficient of determination, R square was found to be .705. This shows that 70.5% variation in employability is accounted from the variability in Technical Specialties Knowledge and Technology Management Skills. The results indicate validation at 95 percent. The beta values for Technical Specialties Knowledge (.467) and Technology Management Skills (.414) are found significant.

Regression Analysis of Personal and Interpersonal Skills

It can be noted from the regression analysis results for the micro variables of Personal and Interpersonal Skills (Annexure II) that the coefficient of determination, R square is .712. This shows that 71.2% variation in employability is accounted from the variability in micro variables of Personal and Interpersonal Skills. The results indicate validation at 95 percent. Beta values for Teamwork and Interpersonal Skills (.259), Problem solving and Critical Thinking Skills (.281), Communication Skills (.228) and Creative Thinking Skills (.158) are found significant.

10. Regression Analysis ofControlled Impact of All Independent Micro Variables

Regression Analysis is undertaken with employability and the seven independent variables i.e. organizational knowledge, the two micro variables of technical skills and the four micro variables of personal and interpersonal skills (Annexure II). The R square for the variables together is .758. This indicates that 75.8% variation in employability is accounted from the variability of all the micro variables taken together. The results indicate validation at 95 percent. Except for creative thinking skills, the beta values of all the micro variables is fund to be significant.

11. Summary of Results for Hypotheses Testing

The results of correlation and regression analysis have been discussed in the preceding section. The subsections below summarize the obtained results.

Summary of Results of Hypotheses Testing for Macro Variables

It can be concluded from the preceding section that all the three macro independent variables i.e. Personal and Interpersonal Skills, Technical Skills and Organizational Knowledge are significant predictors of employability. On the basis of the same, the following table shows the results of testing the macro hypotheses of association.

Table 4: Results of Testing Macro Hypotheses from Employer Perspective

Independent Variable	R-Square	Beta Value	Significance	Hypotheses Code	Status of Alternate Hypotheses
Personal and Interpersonal Skills	.755	.354	.000	HAPIE	Accepted
Technical Skills		.349	.000	HATE	Accepted
Organizational Knowledge		.210	.001	HAOE	Accepted

Dependent Variable : Employability

12. Summary of Results of Hypotheses Testing for Micro Variables

The results of hypotheses testing for micro variables show that all the micro variables of Technical Skills and Personal and Interpersonal Skills tested separately are significant predictors of employability. Based on the same, the table below summarizes the results of testing micro hypotheses of association.

Table 5: Summary of Hypotheses Testing of Micro Variables from Employers' Perspective

Independent Macro Variable	Independent Micro Variable	R-Sqaure	Beta	Significance	Hypotheses Code	Status of Alternate Hypotheses
Technical Skills	Technical Specialties Knowledge	.705	.467	.000	HAT1E	Accepted
	Technology Management Skills		.414	.000	HAT2E	Accepted
Personal and Interpersonal Skills	Communication Skills	.758	.228	.001	HAPI3E	Accepted
	Problem Solving and Critical Thinking Skills		.281	.000	HAPI1E	Accepted
	Creative Thinking Skills		.158	.027	HAPI2E	Accepted
	Teamwork and Interpersonal Skills		.259	.000	HAPI4E	Accepted

Dependent Variable: Employability

The validated models of macro variables, micro variables of technical skills, micro variables of personal and interpersonal skills and controlled impact of all the micro variables are included in Annexure II.

13. Key Conclusions

- There exists a strong correlation between employability and its identified predictors (three macro variables and six micro micro variables of research)
- All the three macro variables and six micro variables are perceived significant by employers for employability. This implies that these factors are important predictors of graduate employability in IT sector from the perspective of employers.
- Although all the macro and micro variables of study are considered as important predictors of employability by the employers, however, the level of significance for employability attached to these variables is different.
- The employers perceive that the two macro variables i.e. Technical Skills and Personal and Interpersonal Skills are more significant for employability than Organizational Knowledge.
- At the micro level, the employers consider that Technical Specialties Knowledge has a stronger influence on employability as compared to Technology Management Skills.
- The employers perceive that each of the seven independent micro variables is significant for employability when considered separately, however, one of them i.e. Creative Thinking Skills was not found to be significant when all the micro variables were taken together.
- Analyzing the controlled impact of variables i.e. when all the micro variables are taken together, highlighted the relatively greater importance attributed to Technical Specialties Knowledge and also the insignificance of Creative Thinking Skills.

14. Directions for Future Research

The present study aims to understand the perception of employers on the predictors of graduate employability. Further, in order to assess the perception gaps between the key stakeholders, a similar study can be conducted to capture the perceptions of the other stakeholder group i.e. graduates (potential job seekers), in the IT sector. Subsequently, the obtained results can be used to examine the perceptual differences between them on the identified predictors of employability. This can be achieved using multivariate statistical analysis techniques like correlation and regression analysis and one- way ANOVA. Such an analysis would enable to investigate the employability gap that stems out of the differences in perceptions. Theseperception differences can furthercontribute to augmenting the employability gap in the sector. Based on subsequent analysis, recommendations can be proposed to plug in the perceptual differences that would abbreviate the existent employability gap.

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