LOGISTIC MODEL TO FIND EMPLOYABILITY OF ENGINEERING STUDENTS EXPECTED BY IT PRODUCT COMPANIES

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Abstract

As per the current business scenario, many IT services companies are selecting a smaller number of Engineering students from campus recruitment as compared to last 5 – 6 years. And the demand of Engineers by IT product companies has been increased slightly as compared to previous years. The objective of this paper is to develop mathematical model to assess the employability of Engineering students as per expectation of IT Product companies. 2 different questionnaires were designed to get the feedback from: 1) HR/ Industry professionals from IT Product companies and 2) Engineering students. Feedback from HR/Industry Professionals has been used to decide weightage for different skill sets like Technical, Communication, Professional, Aptitude, Academic skills. Statistical tool SPSS is used to develop Mathematical model using Binary Logistic Regression method to find the employability.

Keywords: Employability, Binary Logistic Regression, Mathematical Model, IT Product companies.

Introduction

Most of the Information Technology (IT) companies are classified in two major categories: 1) IT services where a greater number of employees are required and job profile is less technical in nature. 2) IT product companies where a smaller number of employees work on relatively more technical oriented job profiles.

Even though many Computer/IT branch engineering students want to join IT Product companies, Employability of them to join IT product companies is a major issue in India in this era of cutthroat competition. To enhance the employability of engineering students, it is first necessary to understand the skill sets required by IT product companies. Once the expectations of IT product companies are understood, the engineering students have to be assessed for various skills like Communication, Technical, Professional, Academic and Aptitude which are demanded by these types of companies.

If we can compare the current knowledge level of students with the expected level of IT Product companies, the skill gaps would be clearly observed. Then activities will have to be planned to improve the skills of students as per the skill gaps.

Hence it is useful to develop mathematical model to assess the employability of students required for IT Product companies.

Methodology: Expectations of the IT Product companies were checked by evaluating the selection process of few IT Product companies. Their evaluation criteria & parameters were studied. All the parameters required for employment in this type of company are categorized in various six groups as follows: 1) Technical Skills 2) Communication Skills 3) Professional Skills 4) Academics 5) Aptitude Skills and 6) Background.

To understand the importance of above parameters related to employability skills in IT Product companies, HR & other industry professionals who have worked in the IT Product Industry were contacted and their feedback about the industry requirements was taken. Ratings were given to the activities which improve the employability skills of various skill groups as mentioned above by these industry professionals. These ratings are used as weightages while developing mathematical model for employability in IT product industry.

The passed-out students at various Engineering Institutes as well as current final year students were asked to submit one survey. Information asked to students regarding skills/ activities to improve activities was for following six groups:

1) Technical: Certification Course, Internship, Projects, Patents, Research Papers, Participation in SAE BAJA/ SUPRA/ ROBOCON, GATE Preparation, Mock Technical etc.

2) Communication: English Communication Course, Speaking, Reading, Writing, Foreign Language, Debate, Group Discussion, Mock, HR Interviews

3) Professional: Confidence, Attitude, Teamwork, Flexibility, Learning Attitude, Innovative/ Creative Thinking, Leadership, Extracurricular Activities Etc.

4) Academics: Aggregate marks of Engineering, SSC & HSC Marks, Completion of BE in 4 years' Etc.

5) Aptitude: Aptitude Preparation Course, Exams like AMCAT, CoCubes, CAT/GMAT Preparation, Mock Aptitude practice Etc.

6) Background: Medium of school education, School/College Location, Parent's Education, Branch of Engineering, Type of college, Industry Connect, Number of Companies.

These student respondents were also asked to submit the details about their placements as follows: Whether they were placed in On Campus/ Off Campus Recruitment Drives, whether they were placed in IT product type of companies, what was the Salary etc.

Through this survey, we got the information about which activities the students have done during their Engineering education. All the data of around 1,000 student respondents was cleaned, filtered and then analysed using Microsoft Excel and the statistical software tool SPSS.

Data Analysis:

It was done in 2 phases: 1) Feedback from HR/Industry professionals was used for calculating the weightage for various skills/activities to improve various employability skills. The detailed analysis of this data was done to find out which are the priority Skill Groups expected by the

IT Product companies. 2)The responses from students were first converted into binary outputs where Yes/No questions were there.

As we wanted to develop the mathematical model to find whether student is employable or not for IT Product Company, we used Binary Logistic Regression method in SPSS for the Analysis.

While using SPSS, we used the following types of variables in the Equation:

Dependant Variable:

Employability (Placed/Unplaced) : Binary (Yes/NO) or (1= Placed & 0=Unplaced)

Independent variables:

1. Technical Skills
2. Communications Skills
3. Aptitude Skills
4. Professional Skills
5. Academics
6. Background.

Strength and Significance of logistic regression model:

Nagelkerke R2 is used to study the strength of the model. Nagelkerke R2 =0.929

Significance of the model is accessed using only Chi Square.

The omnibus Chi-Square is significant at 5% level of Significance.

[$\chi^2_{(6)}$=465.036, P< 0.005]

Since the Chi-Square test value is significant, it is inferred that the Logistic Regression model is significant.

The confusion matrix table given below reveals that the correct classification for the placed students is 95.7 % & the correct classification rate for unplaced students is 98.9 % and the overall correct classification rate is 98.4%.

Classification Tablea

Observed		Predicted		
		Placed_not		Percentage Correct
		Unplaced	Placed	
Placed_not	Unplaced	521	6	98.9
	Placed	4	88	95.7
Overall Percentage				98.4

Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
Technical	0.135	0.03	24.44	1	0	1.144
Communication	0.041	0.02	3.215	1	0.07	1.042
Professional	0.098	0.03	8.218	1	0	1.103
Academics	-0.004	0.05	0.005	1	0.94	0.996
Aptitude	0.035	0.02	3.785	1	0.05	1.035
Background	0.022	0.03	0.421	1	0.52	1.022
Constant	-17.76	5.33	11.13	1	0	0

From the above table following observations are drawn:

Technical skill, Professional Skill and Aptitude skills are significant predictors of the Employability [P<0.05].

Communication Skill is partially significant [P>0.05 but < .1] Academic and Background are insignificant Predictors.

Mathematical Model for Employability of Engineering Students in IT Product Industry to predict whether student is employable or not is as follows:

Logistic Regression Model

In [odds]Employability= -17.763+0.135 [Technical Skill] + .0098 [Professional Skill] + 0.035 [Aptitude Skill] +0.041

[Communication Skill] From the above discussion it can be concluded that

Technical skill is most meritorious predictor of Employability followed by Professional Skills, Aptitude Skills and Communication Skills.

Since Chi- Square value is significant, it is inferred that logistic regression model is significant.

Calculation Table:

Table 1 shows the skill groups for which P Values are

Significant (. i.e. P value < 0.05):

Sr. No.	Group
1	Technical
2	Communication (partial)
3	Professional
4	Aptitude

Table 1 : Significant Skill Groups for IT Product Companies the Priority of Importance Levels of Various Skill Groups for IT Product Companies are shown in Table 2.

Sr. No.	Skill Group	Importance Level
1	Technical	1 (Wald 24.44)
2	Professional	2 (Wald 8.218)
3	Aptitude	3 (Wald 3.785)
4	Communication	4 ((Wald 3.215)

Table 2: Importance Levels of Skill Groups for IT Product Companies

It has been observed that Academics does not come as important factor in the results of SPSS but it is one of the important factors. When percentage was checked, it was observed that the students were from various universities across India who had completed their School, College

& Engineering from the different boards, universities & colleges & that's why there was variation in marks. Percentage marks of Unplaced students from few universities were higher than some of the Placed students from other universities. Hence the results were showing that Academics was not very significant factor.

Conclusion:

From the above study & further analysis of important activities & skills required for the engineering students to become employable in the IT Product companies, students must prepare themselves more for Technical Skills, followed by Professional, Aptitude & Communication skills. Mathematical Model developed through this study using Binary Logistic Regression in SPSS can be used to find if the student is employable or not in IT Product industry. This information can be useful for engineering colleges & faculty to focus more on technical preparation of engineering students because mass recruitment in IT Services companies is reducing & more jobs will be available in IT Product companies where students get Job Profiles which are more technical in nature as compared to IT Services companies.

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