Investigating the Technology Diffusion Problems in a Multi Culture Environment: A Case of Telecom Sector

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System generated real time data is administered for evaluating the employee performance after implementing the new SpeechLog software in the QAU department as well as a questionnaire based survey was administered personally on 140 employees, In response to the survey, 120 valid responses were received. The response rate was 85%. Among the respondents, 70% were male while 30% were female.

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The findings indicate that the emerged model over all explains 71% variation in intention to use while ease of use job-fit training and top management support were significant factor while explaining the intention to use SpeechLog software. Mostly respondents agreed that they like the idea of using SpeechLog software and they want to adopt it. Employees say that it has improved their work performance by completing their task efficiently. This research will help the Telecom organization's Management to understand the problems faced by employees while diffusing a new technology.

Keywords : technology diffusion, telecom industry, technology acceptance, culture.

I. Introduction

On the global basis, diffusion of technology is occurring at vastly different rates between the developed and less developed countries. In developing countries, there has been a great increase in diffusion of technology from different cultures. It is evident that governments and private sector today regard technology diffusion as an important route to increased competitiveness, especially diffusion of new technology into telecom sector with advantages of flexibility, dynamism and responsiveness. Technology diffusion involves the dissemination of technical information and know-how and the subsequent adoption of new technology and techniques by users (Tassey 1992). It can also be defined as diffusion between different persons, firms and /or countries (Keller 2006).

Technology can diffuse in multiple ways with significant variations, depending on the particular technology, across time, over space, and between different industries and enterprise types. Moreover, the effective use of diffused technologies by firms frequently requires organizational, workforce, and follow-on technical changes. It is evident from literature that there are a number of potential factors that could influence the usage of an information system. In many developing countries organizations faces problem and even failure in transferring technology into practice (Atiyyah 1989; Cuningham & Sarayrah 1994). One common reason for its failure is the unwillingness or reluctance to change of users to accept a new technology. Developing countries come across cultural and social barriers when diffusing technology into practice.

The intent of this study is to report these problems in the progression of examining the role of culture during the technology diffusion in Telecom sector organization of Pakistan. The population of this study was XYZ employees of QAU department who were using new technology for call evaluation of call center department.

The objective of technology diffusion in any organization is to provide large benefits over time which in turn proves to be economically important. Further it involves internal reorganization of both production and management processes as well as upgrading of skills which leads to increase in economic value (Erik A & Ken.G 2002).

Previous research addressed different problems in technology diffusion in a multi culture environment as well as different models has been proposed by scholars from different disciplines and studied technology diffusion and acceptance of user towards information system from different perspectives (Ajzen, 1991; Davis, 1989; Venkatesh, Morris, Davis & Davis, 2003; Clarke, 1999; Thompson, Higgins, & Howell, 1994). Individuals

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task completion play's a key role in organizational performance, the users should be provided successful training to encourage the SpeechLog application usage as its training and learning are very important in successful implementation. The positive usage behavior of this software will leads to job completion on time, which improves the employee's performance. The objective of this study is to explore various problems that might be faced by the management and employees during technology diffusion.

II. THEORETICAL FRAMEWORK

An investigation into the past research revealed that a considerable amount of literature is there regarding technology diffusion problems while diffusing a new technology in an organization. A set of variables have been explored to study the intention to use of employees. It will provide the information as to which variable is more influential in the usage of SpeechLog application by the employees of telecom sector Pakistan. The name of the telecom organization is kept confidential in the study and don't mentioned here due to the organizational policies. This research is expected to contribute to the understanding for management the challenges in in build technology diffusion towards use of SpeechLog application; it will calculate the overall software performance through real time system generated data. The second part of the research is also important in providing information about the employee's intention to use SpeechLog application and the problem faced by the employees while using a new technology. Based on the following research a framework is emerged as shown in Figure 1. In this research model, Ease of use, Job-Fit, Facilitating condition, training, top management support, project communication and culture are the independent variables which have their effect on the intention to use SpeechLog software (dependent variable). In order to achieve the research objective, following research hypothesis are proposed.

H1- Perceived ease of use has a positive correlation with intention to use SpeechLog software of employees.
H2- Perceived Job-fit has a positive correlation with intention to use SpeechLog software.
H3- Facilitating condition has positive impact on employee intention to use a SpeechLog software.
H4- Training has positive impact on intention to use SpeechLog software.
H5- A relationship exists between top manage-ment support and employee intention to use SpeechLog software.
H6- Project communication has positive impact on employee intention to use SpeechLog software.
H7- Culture has positive impact on intention to use SpeechLog software.
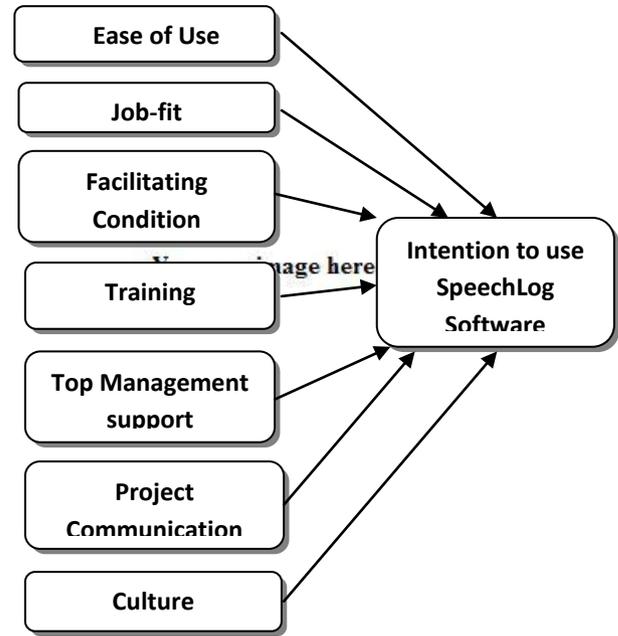

Figure 1 : The proposed research model

III. METHODS

The real time system generated data was collected for the 100 days for calculating the SpeechLog software performance. The call targets assigned by management and evaluated through SpeechLog software has been analyzed as well as Number of queries made through different departments and answered through SpeechLog software of QAU department has been analyzed so as to calculate the overall performance increase of the QAU department.

a) Respondents

Questionnaire was distributed among 140 employees working in QAU department of telecom organization located in Islamabad Pakistan. In response, 120 questionnaires were returned. Data of 120 completely filled questionnaire were entered in statistical Package for Social Sciences (SPSS) for analysis. The response rate was 85%. The response shows that the sample represented CCE's, Supervisor, Assistant Managers and manager. A pilot test was conducted to verify various dimensions of the questionnaire such as ease of completing the questionnaire, language used, and appropriateness of questions with relevance to usage behavior. Fifteen SpeechLog users working in QAU department of XYZ Company were asked to fill in the questionnaire. Feedback was obtained, in result of the pilot study minor changes in statements of the final survey tool were incorporated.

b) Measure

The questionnaire used in this research was adapted from the studies conducted on intention to use

a new technology or software (Davis (1989), Venkatesh et al (2003) and Thompson et al (1991)) and computer software evaluation form.
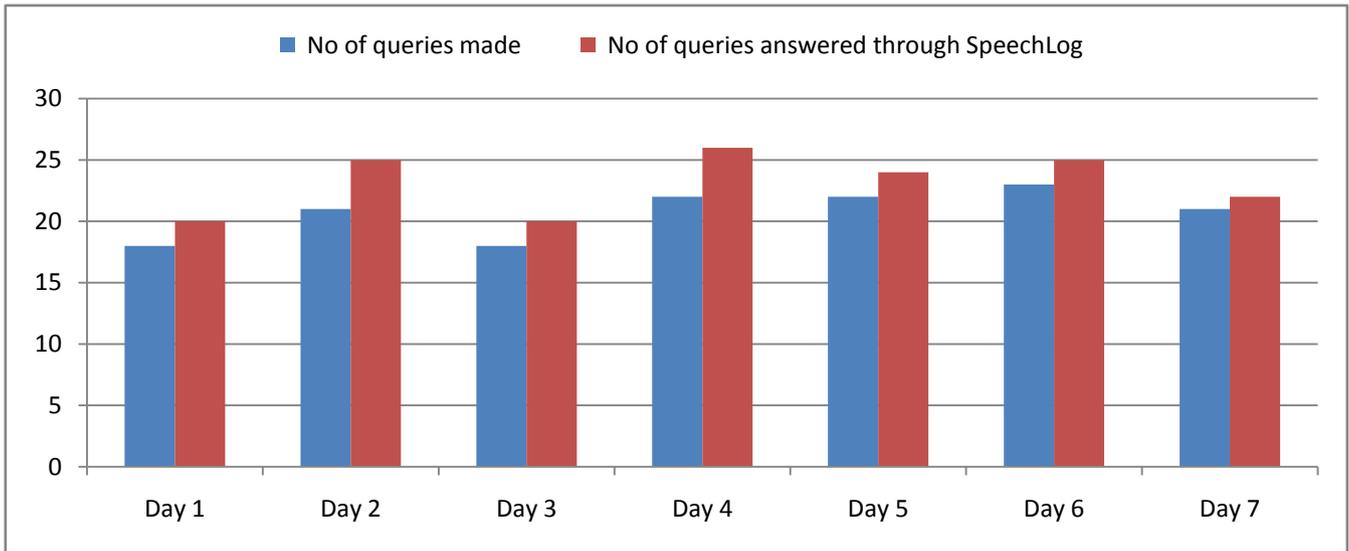

Figure 2 : SpeechLog Application Performance of 1st Week

IV. RESULTS AND DATA ANALYSIS

a) System Generated Data & it's Analysis

To explain any phenomenon we seek to explain it by collecting data from the real world and then using data to draw conclusions. In this study we have taken the data of about 100 days of SpeechLog Application, it contained the details regarding queries made and the queries answered through SpeechLog as well as the assigned target done by the agents. The SpeechLog performance of first & second week for Number of queries made and answered is shown in figure 2 & 3. It
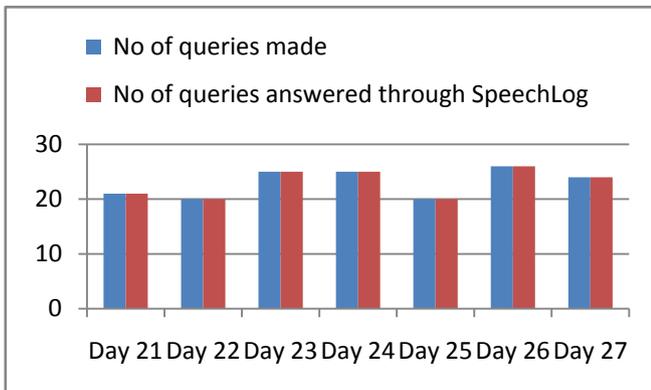

Figure 3 : SpeechLog Application Performance for 2nd Week (For Queries)

explain how SpeechLog Application will help the QAU department to answer the queries made as well as by answering some additional queries it will increase overall performance of the organization.

The assigned call evaluation target is also analyzed, data for the first Week is shown in figure 4, it

explain how SpeechLog Application will help the agents to complete their target on time as well as by providing help through completing the additional call target will in turn increase overall efficiency of the department.
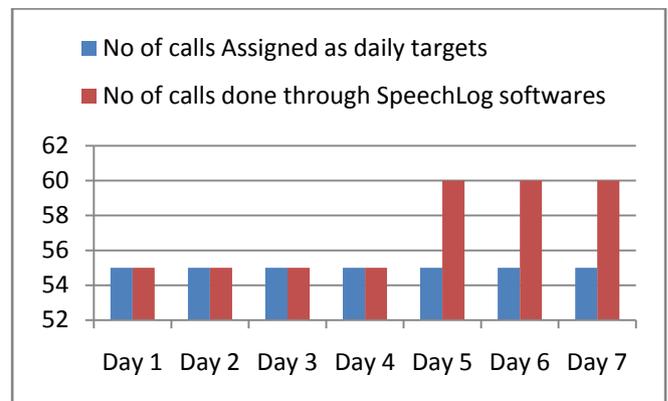

Figure 4 : SpeechLog Application Performance for 1st Week (For Call Target)

The Figure 5 shows the call evaluation target done through SpeechLog software for the second week.

b) Reliability Statistics

To confirm the reliability of the questionnaire, cronbach's Alpha reliability statistics analysis was conducted. In statistics the cronbach's Alpha value greater than .5 is considered to be reliable scale.

Table 1 shows the reliability statistics of the questionnaire. The value .947 shows that the scale used in the questionnaire is highly reliable.

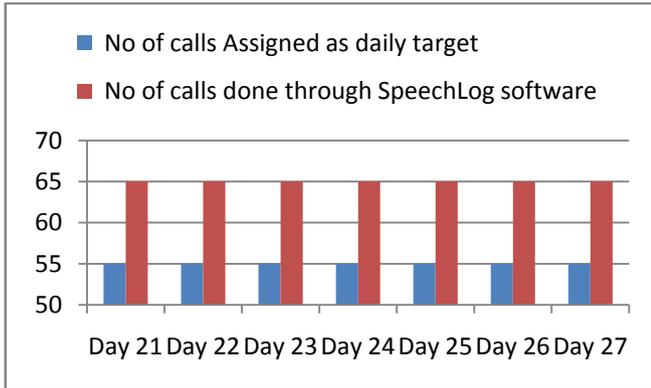| Cronbach's Alpha	N of items
.947	29

Table 1 : Reliability Statistics

Figure 5 : SpeechLog Application performance for 2nd[t] Week (For Call Target)

c) Descriptive Statistics

In order to explore the SpeechLog user responses with respect to gender. A frequency statistics was made.
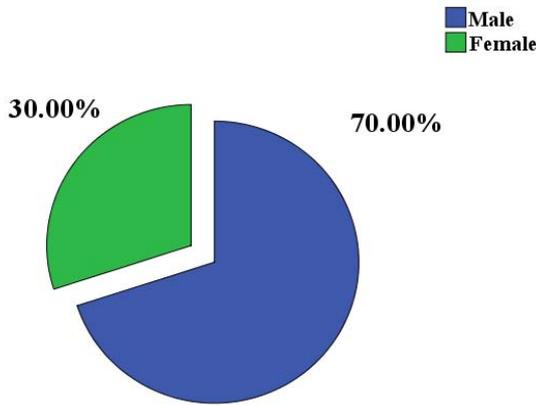
Figure 6 : Descriptive data of gender wise response

The figure 6 shows the frequency distribution of the respondents. Out of 120 responses, 70% were male and 30% were female.

Figure 7 shows variation in age of the respondents. Out of 120 respondents, majority lies in 31-40 age group (N=102), while seventeen are in 20-30 age group, and 1 in 41-50 age group.

Figure 8 shows the respondents distribution according to their working experience. Mostly respondents (N=52) have 5-6 years experience, 33 respondents have 3-4 years experience, 20 respondents have 7-8 years experience, 12 are in 9-10 years experience block while only 3 have 1-2 years experience.
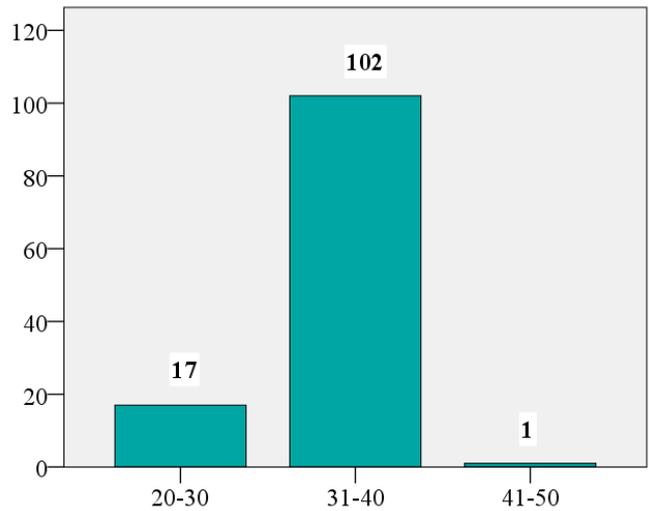
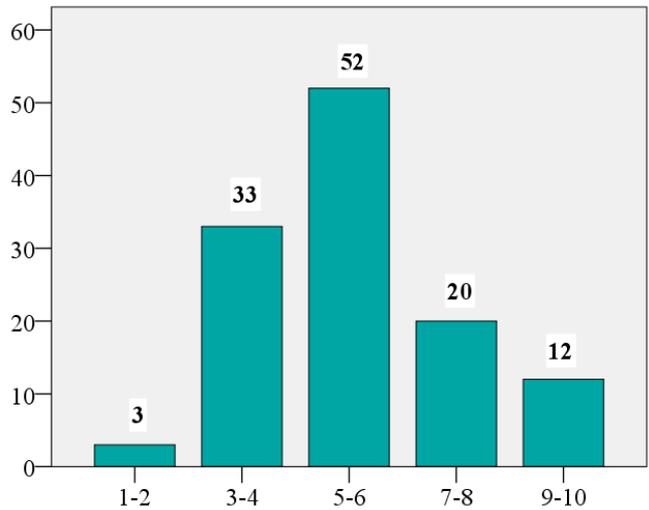*Figure 7 :* Age wise distribution of SpeechLog users

Figure 8 : Experience wise distribution of SpeechLog users

To find out the respondents experience in using SpeechLog Application. The frequency distribution with respect to their experience in SpeechLog software use is shown in figure 9.

Figure 9 represent the SpeechLog usage experience possessed by the employees. Mostly respondents (N=50) had more than more than 2 years of experience, 37 having 1-2 years of experience while only 33 have less than one year experience in use of SpeechLog software.

Figure 10 represent the respondent's distribution according to their education. Mostly respondents (N=73) had master degree qualification, 44 having bachelor degree qualification while only 3 have MS degree qualification.
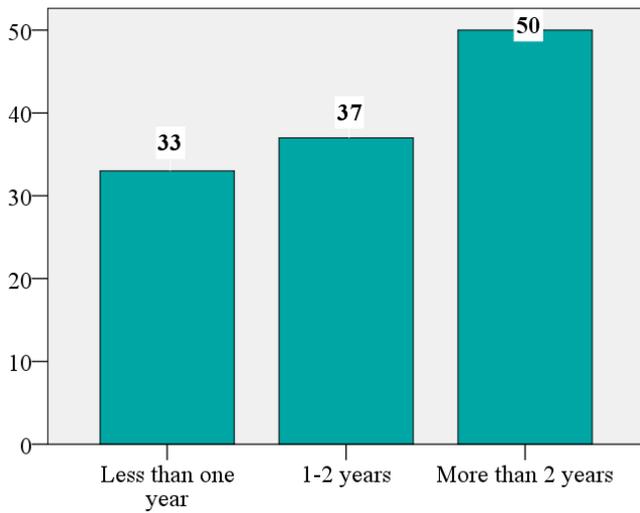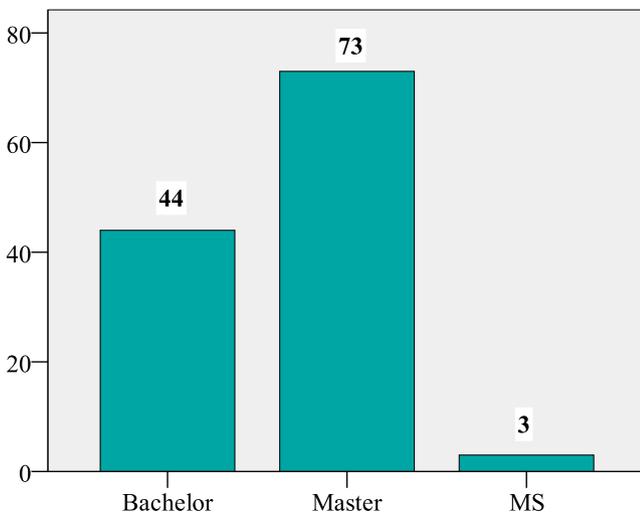
Figure 9 : SpeechLog usage Experience

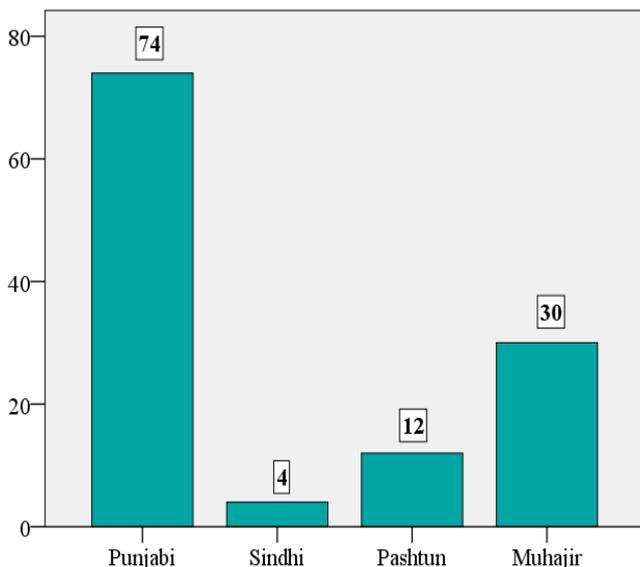*Figure 10 :* Education wise distribution of SpeechLog users

Figure 11 : Ethnic Origin wise distribution of SpeechLog users

To find out the respondents cultural profile. The frequency distribution with respect to their Ethnic origin and city is shown in Figure 11 & 12.

Figure 11 shows the respondent distribution according to ethnic origin. Mostly respondents (N=74) had Punjabi origin, 30 respondents have Muhajir origin, while 12 have Pashtun origin and only 4 have Sindhi origin.
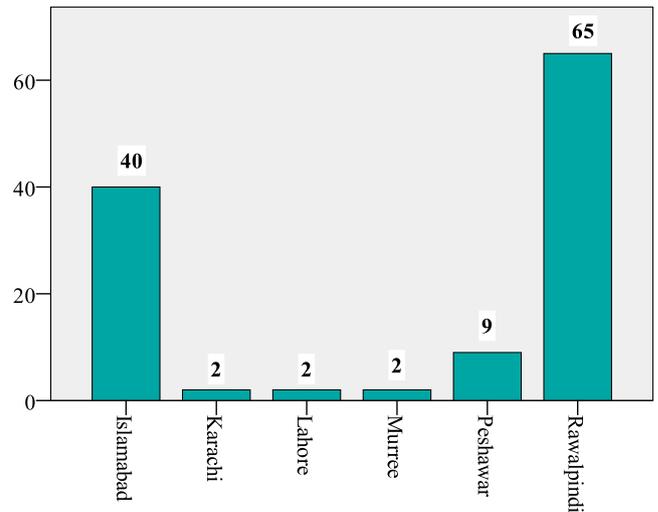

Figure 12 : City wise distribution of SpeechLog users

Figure 12 represent the respondent's distribution according to their city. Mostly respondents (N=65) belongs to Rawalpindi, 40 respondents belongs to Islamabad while 9 belong to Peshawar 2 each belongs to Murree, Lahore and Karachi.

d) Hypotheses result and analysis

In table 2 the R2 (.72) value shows that the independent variable explains the 71% variation in the intention to use SpeechLog software. Here we can say that our model best fits and it explain significant variation in the intention to use.

Table 3 shows the beta and significance value of each independent variable in regression model.

The significance value (p=.000) in table 3 shows that ease of use and Job-fit is significant in measuring the intention to use. The beta value, B=.322 of Ease of use show that ease of use contribute to .322 variation the intention to use.

Table 2 : Regression Analysis

Model	R	R Square	Adjusted R square	Std Error of the Estimate
1	.833	.712	.703	.38816

9

Table 3 : Detailed Regression Analysis

Dependent Variables	R2	Independent variables	Beta	T	Sig
Intention to Use	.82	Ease of use	.322	4.602	.000*
		Job-fit	.505	6.873	.000*
		Facilitating Condition	.063	.917	.360
		Training	.172	2.967	.003
		Top management support	.189	2.967	.003
		Project Communication	.036	.686	.494
		Culture	.007	.094	.925

Note. *Significant at .005 level

The value (B= .505) shows that the variable job-fit strongest predictor in measuring the behavior intention. Here we will accept H1 and H2.

Table 3 shows the regression analysis, the p value (p>.005) shows that facilitating condition is not a significant variable in measuring the intention to use. Hence we reject H3.

The p value (p=.003) in table 3 shows that training is a significant variable in measuring intention to use. Here we accept H4.

In table 3, Top management support is a significant variable in measuring intention to use. Here we accept H5.

The p value (p=.494) in table 3 shows that the project communication is not a significant variable in measuring intention to use. Here we reject H6.

In Table 3, the p value (p>.005) shows that culture is not a significant variable in measuring the behavior intention. Here we reject H7.

V. Findings

The results of correlation analysis shows that Ease of use, Job-fit, Facilitating condition and training are strongly correlated with the intention to use SpeechLog software while top management support, project communication and culture have medium level correlation with intention to use SpeechLog software. The R square value (.72) shows.

That the overall independent variable explains 71% variation in the intention to use SpeechLog software.

Here we can say that the model best fits and it explain significant variation in the intention.

The p value of culture (p=.925) shows insignificant variable in measuring the intention to use.

The p value (p=.360) in the regression analysis of the facilitating condition shows that this is not a significant variable in measuring the intention to use.

While exploring all variables individually, the variable ease of use is significant in measuring the intention to use. The beat value, β=.322, show that ease of use is stronger predictor of intention to use. Job-fit is significant while explaining intention to *Use SpeechLog software. The negative beta and t* value indicate that this variable is not positively associated with the intention to use.

The regression analysis shows that the Job-fit is a significant variable while project communication is not a significant variable. Top management support and training were also found the significant contributor toward measuring intention to use toward use of SpeechLog software.

The overall findings analyzed from the questionnaire 'comments part' regarding problem faced while using this SpeechLog software by the employees are resistance to change, proper resources are not available, processing speed is low due to the unavailability of proper resources, Frequent training programs are required, and employee's believe that SpeechLog software is a valuable purchase and company should adopt it. The findings indicate that the culture don't have any impact on intention to use of SpeechLog software.

The findings from the analysis of the system generated real time data indicate that the SpeechLog software efficiently complete the task on time.

VI. Conclusions

This study was centered on SpeechLog software intention to use and the problem faced while diffusing it. The aim of this study was to investigate factors affecting the employee intention towards use of SpeechLog software and its impact on the overall performance of the organization as well as to explore various problems that might be faced by the management and employees during technology diffusion among different cultures.

The first part of the study explores the literature related to technology diffusion problems faced while diffusing technology among different cultures. Use of different models and theories of intension to use of technology in different sectors especially in the telecom sector.

During the exploration of literature, many factors were identified for measuring the intention to use towards use of a new technology. Based on the findings a theoretical model is emerged. The population of this study was telecom organizations employees who were

using SpeechLog software in QAU department of the company. The sample size of 140 was selected, however, 120 out of 140 selected participants responded. A questionnaire based survey was administered personally on 140 employees who were using SpeechLog software. In response to the survey, 120 valid responses were received. The response rate was 85%. Among the respondents 70% were male while 30 % were female, the findings of this study indicate that majority of the respondents agreed that they like to use SpeechLog software. They want to become professional in SpeechLog software use and intend to use it in future. Most of the respondents think that it is a valuable purchase and company should adopt it. This research will help the management to understand the factors responsible for the intention to use SpeechLog software as well as to find out the problems faced by the employees while using new software.

VII. Recommendations

Based on the findings of this research, the following recommendations are given to increase intention to use SpeechLog software as well as overcoming the problem faced by the employees while using SpeechLog software.

i. There is need to ensure the employees that by using SpeechLog software they will become a valuable assets to the organization by completing their tasks efficiently.

ii. The employees should be provided with additional bonuses if they are performing well with the use of this new technology.

iii. Frequent meetings should be planned to find out the problems faced by the employees.

iv. The technical support should be provided to employees.

v. The senior management should also frequently use the SpeechLog software to evaluate its effectiveness.

vi. Frequent training programs should be planned to improve the understanding of the software features.

vii. Top management should be supporting and should communicate well in time about the implementation of the new software.

viii. The senior management should encourage SpeechLog usage.

ix. Organization should provide necessary resources to use SpeechLog software.

VIII. Future Research Direction

Current research explains the 72% variation in the intention of use of the employees. The 29% portion is unmeasured. There is a need of future research which explores the further variables to measure the leftover portion which was not measured in this research. This research could be helpful for other Telecom sector organization to study the problems faced while diffusing a new technology, it should be carried out in other telecom sector organizations as well as it could also be applied to other departments of the same company.

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