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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

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ACKNOWLEDGMENTS

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APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITES

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

THE CAUSAL EFFECTS OF EDUCATION ON TECHNOLOGY IMPLEMENTATION – EVIDENCE FROM INDIAN IT INDUSTRY

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ABSTRACT

In the last few decades, scholars and practitioners have increasingly tried to understand the factors that influence IT project success. In response to this concern, several theoretical models have been proposed to explain user attitude towards IT projects. This study mainly focuses on the relationship between user attitude and IT project success. As the changing demographics of the workplace may affect IT project outcomes, there is growing recognition that demographic variables are needed to understand an individual's attitude towards IT project and its influence on the project outcome. This study provides an empirical examination of the significance of level of education may have on the user attitude and which in turn may impact the IT project outcome. Based on the analysis of 478 responses from employees of 40 large and SME Indian IT organizations, the findings suggest that there is a positive relationship between the user attitude and IT project success. The study suggests that favorable user attitude will positively contribute to the IT project success. This study mainly identified that there is significant influence of the level of education on the user attitude. The results of this study are consistent with previous studies with significance of level of education on the IT project success. With increased level of education, the perception of the project success and business success is more favorable. This is attributed to the factor that highly educated workers tend to adopt new technologies faster than those with less education. The IT project success partly depends on the human capital and their knowledge of the new technology and therefore increased levels of education raise the probability of early adoption and utilization of technology and therefore success of IT projects.

KEYWORDS

Cognitive, Affective, Conative, IT project success, User attitude, IT implementation climate.

INTRODUCTION

Many factors drive the organizational change. Technology is one of the main enablers of change within organizations. Businesses are forced to constantly review the existing technology and strategize the need to implement newer technologies. Organizations routinely make massive investments in information technology (IT) in order to improve performance, reduce costs, increase productivity, or improve product quality. According to the results of sixth annual business technology survey by McKinsey global survey, aspirations and current expectations for IT is very high and also a greater willingness to spend more on IT.

Equally massive is the cost of failed IT projects, with a combined estimated cost of over $290 billion for Western Europe and the U.S.A. A Standish group cross-industry survey of 280,000 IT projects found that 23% were cancelled before implementation, and 49% of the completed projects exceeded budget allocations and provided less functionality than originally required. Research consistently shows the majority of the problems and issues experienced by technical programmes are people related as shown in the table 1 below.

TABLE 1

People	62%	Change management (the most important factor identified), internal staff adequacy, training, project team, consultants, prioritization/resource allocation, Top management support, Consultants, Ownership, Discipline
Process	16%	Program management, process reengineering, benefit realization, stage/transition
Technology	9%	Software functionalities, application portfolio management, enhancements/upgrades
Knowledge Assets	3%	Reporting, data

Source: Deloitte Consulting and Benchmarking Partners

Not surprisingly, researchers and practitioners are concerned with the issue of understanding and managing employee reactions to such IT projects. In response to this concern, several theoretical models have been proposed to better understand and explain individual attitudes and behaviours toward IT projects. This study mainly focuses on the relationship between user attitude and IT project success. The extended model incorporates the demographic variable education in predicting the user attitude towards IT project success.

RESEARCH PROBLEM

Organizations spend money on technology transformations to make money and improve operational efficiencies. More spending doesn't necessarily guarantee high success rates. Common pitfalls associated with IT project are:

- The Return on Investment (ROI) and/or stated benefits are never realized
- The new system were only adopted by a small portion of the organization
- When the project went live, critical business systems halted, causing loss of revenue, increased costs, dissatisfied customers and frustrated employees
- The project has been attempted more than once, ran over budget and was late, or was never completed
- Employees are not happy with the end result of the project

Enterprises increasingly recognize that preparing for an IT project can make the difference between the success and failure of a project. Therefore studying the significance of user attitude and level of education towards the IT project success is very important.

RESEARCH OBJECTIVES

The objective of this study is to examine the modified applicability of innovation implementation model by M.J. Kemp and G.C. Low as described in their study "*ERP innovation implementation model incorporating change management*" to describe the relationship between user attitude and IT project success and to understand the significance of level of education on user attitude in the Indian IT organizations. Specifically, the research objectives are:

- To explore the various dimensions of user attitude and IT project success criteria
- To identify the relationship between user attitude and IT project success
- To explore the differences evoked between segments of respondents towards IT project outcome on the basis of the level of education.

LITERATURE SURVEY

This chapter presents a literature review of various aspects of user attitude and Project success criteria.

USER ATTITUDE

Advocating the school of thought of Krech, Crutchfield, and Ballackey as discussed in their book "*Individual in Society*", suggested that attitude consist of cognitive, affective and behavioural components. The cognitive part of attitude includes statements of beliefs. The affective component of attitude is the emotional or "feeling" about certain things. The behaviour part of attitude is what the individual actually does or intends to do.

According to Aladwani A M as explained in his study "*Change management strategies for successful ERP implementation*", the implementation climate makes the three-level adoption process think-feel-do that provides a good framework for describing this phase. The "thinking" process refers to changing the cognitive components of user attitude. This thinking process is mainly influenced by the perceived benefits and project awareness. The "feeling" process is about influencing the affective components of user attitude. The "do" process (intention to adopt) is conative stage. According to Krech, Crutchfield, and Ballackey, adoption intention (behavioral attitude) is what the individual actually does or intends to do. M.J. Kemp and G.C. Low in their study "ERP innovation implementation model incorporating change management" indicate that favorable user attitude influence the ERP implementation effectiveness." However, in their study, the implementation effectiveness was considered from the perspective of the users of the ERP system who may not be in a position to provide the business and project outcome of this implementation.

IT PROJECT SUCCESS

Cooke-Davies T in his study "*The real success factors on projects*" distinguishes between project management success being measured by time, cost and quality, and project success, which is measured against the overall objectives of the project. Espinosa J, DeLone W, Lee G, in the study"*Global boundaries, task processes and IS project success: a field study"* suggest that success for IT projects can be viewed as a combination of project implementation success and systems success. According to Ballantine J, Bonner M, Levy M, Martin A, Munro I, Powell P , in their study , "*The 3-D model of information systems success: the search for the dependent variable continues*" suggests system success can be separated into three levels: technical development, deployment to the user and delivery of business benefits . DeLone W & McLean E in their study"*Information systems success: the quest for the dependent variable"* proposes six major dimensions of systems success, which they refine to include: system quality, information quality, service quality, use, user satisfaction and net benefits .The criteria used by companies to define success were coded and grouped into three categories by Graeme Thomas & Walter Fernandez after studying the previous literatures as explained above in their study, "Success in IT projects: A matter of definition?" as project management success, technical success and business success. Based on the discussions with academicians and practitioners, the success of the IT project has been retained as is in the study by Graeme Thomas & Walter Fernandez but by grouping the items into two major categories as they appeared statistically significant: Project Success and Business Success.

Graeme Thomas and Walter Fernandez in their study have only defined the project success criteria but the study did not relate the user attitude and IT project success.

DEMOGRAPHIC VARIABLE – LEVEL OF EDUCATION

It is commonly believed that education increases the probability of using technology in the job. Craig Riddell in the study *"The Causal Effects of Education on Technology Adoption: Evidence from the Canadian Workplace and Employee Survey*" indicates that employees with more education possess longer work experiences in using computer, and are more likely to experience upgrade in computer-controlled or computer-assisted technology and experience upgrade in technological device than those with less education.

Sona Mardikyan, Betul Beşiroglu and Gozde Uzmaya, in their study "*Behavioral Intention towards the Use of 3G Technology* "suggests that with the increase of education level, people have more tendencies to use the technology, to adopt it and to add it into their daily life.

RESEARCH GAP

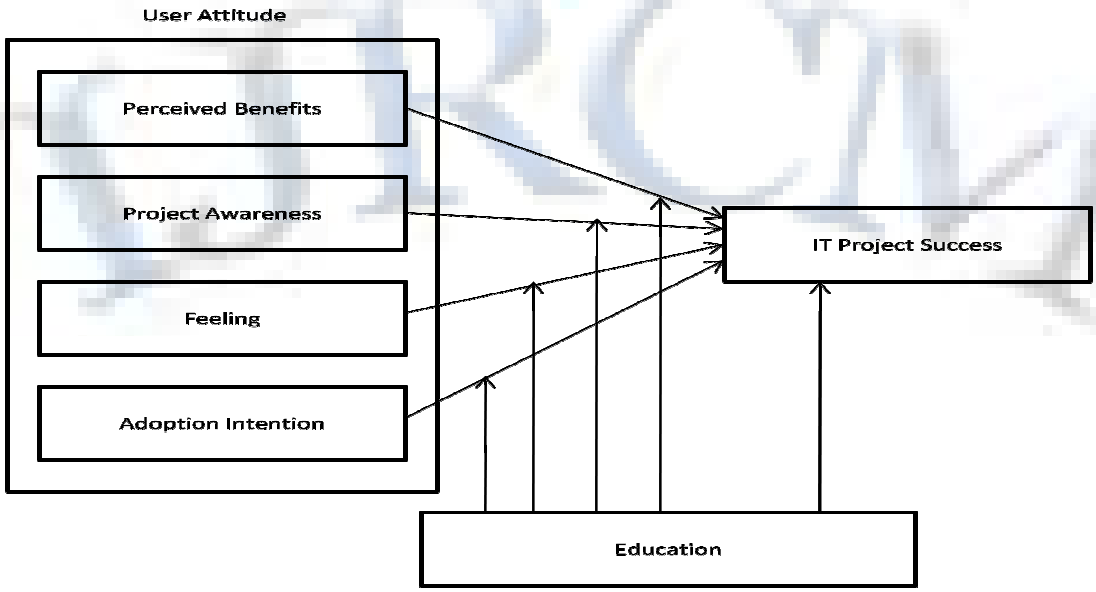
Based on the literature study, the following gaps have been observed:

- The previous research did not study the significance of level of education on the IT project success.
- The previous studies mostly have been in the area of technology acceptance and technology adoption and did not involve the IT implementation projects.
- The studies so far have not integrated the concepts of user attitude, level of education and IT project success in one study.

RESEARCH MODEL

Adopting the Aladwani model, the user attitude for an innovation can be described as the sum of employees' observations and experiences regarding the innovation. Developing over Aladwani's model, the MJ Kemp ERP implementation innovation model describes the situation where user's awareness, feelings and intention to adopt an ERP system as providing a greater level of detail implementation climate. The current research model is the modified innovation implementation model of MJ Kemp as shown in Figure 1.

FIGURE 1: RESEARCH MODEL



RESEARCH METHODOLOGY

A survey questionnaire was designed to measure the research model variable constructs. There were 41 survey items that are primarily adapted from the relevant previous research as shown in table 2 & 3. All items were measured on a 5-point Likert scale from strongly disagree-1 to strongly agree-5. The survey instrument also captured values for the level of education as shown in table 4. Random sampling procedure was used to identify the respondents from a list of all Indian IT organizations (Large and SME) as listed in the Bangalore Stock Exchange.

TABLE 2 : REVIEW OF LITERATURE : USER ATTITUDE VARIABLES

USER ATTITUDE		
Dimensions	**Author**	**Journal**
Project Awareness	Hong Seng Woo	Journal of Manufacturing Technology Management
	Olivier Francoise	Business Process Management Journal
	Delloite	Deloitte Consulting & Benchmarking Report 2008
	Carla Marnewick	Information Management & Computer Security
Perceived Benefits	Carla Marnewick	European Journal of Information Systems, Information Management & Computer Security
	Fiona Fui-Hoon	Business Process Management Journal
	Frank Lin and C.E. Tapie Rohm 2009	Business Process Management Journal
	Davis Fred 1989	MIS Quarterly
Feeling	Ronald L. Thompson	MIS Quarterly
	Gholamreza Torkzadeh 2006	Information & Management Systems
	M J Kemp	Business Process Management Journal
Adoption Intention	M J Kemp	Business Process Management Journal

TABLE 3 : REVIEW OF LITERATURE : IT PROJECT SUCCESS VARIABLES

IT PROJECT SUCCESS		
Dimensions	**Author**	**Journal**
Project Success	Graeme Thomas, Walter Fernandez, 2008	International Journal of Project Management
	Ambler, Scott W, 2007	Dr. Dobb's Journal
	Carla D. Kendrick	Research Thesis
	DeLone and McLean,1992,2012	Journal of Management Information Systems
Business Success	Princely Ifinedo,2008	Business Process Management
	Atkinson R, 1999	International Journal of Project Management
	White D & Fortune J, 2002	International Journal of Project Management
	Cooke-Davies,2002	International Journal of Project Management

DATA ANALYSIS AND RESULTS

The data analysis for this study was conducted using SPSS statistical tool. A total of 478 responses from 40 Indian IT companies were received. The demographic profiles of the respondents are as shown in the table 4. All respondents were part of the IT implementation project in their career and contributed to the outcome of the IT project.

The reliability of each of the measures was investigated with Cronbach's alpha. Cronbach's alpha, as a rule of thumb, a reliability of .70 or higher is required before an instrument will be used as suggested by George and Mallery in their SPSS guide "*SPSS for Windows Step by Step: A Simple Guide and Reference 14.0 Update*". Reliability results of the measurement model are reported as shown in Table 5. The reliability scores of different measures in the model exceed the recommended threshold value of 0.70. The data indicates that the measures are robust in terms of their internal consistency as indicated by the cronbach alpha values. Factor analysis was carried out to identify underlying items that explain the pattern of correlations within a set of observed variables. Each item's factor loading on its respective construct is highly significant with results as shown in the tables 6 and 7 below:

A correlation analysis was run based on each of these constructs and the results are reported in Table 8. A regression analysis was also run to analyze the relationship between user attitude and IT project success as shown in table 9. Further, the research model as in Figure 1 was analyzed using T test for the significance of education to understand the difference in perceptions between the groups towards user attitude and IT project success. The results are as shown in table 10.

TABLE 4: RESPONDENT PROFILE

DEMOGRAPHIC VARIABLES		N	%
Type of Company	Mid	243	51%
	Large	235	49%
	Total	478	100%
Age Group	Below 30 years	225	47%
	31-40 years	209	44%
	> 40 Years	44	9%
	Total	478	100%
Level of Education	Graduate	245	51%
	Post Graduate	229	48%
	PhD	4	1%
	Total	478	100%
IT Experience	< 5 years	68	14%
	5 to 10 years	222	46%
	11 to 15 years	125	26%
	>15 years	63	13%
	Total	478	100%

TABLE 5: RELIABILITY SCORE

Constructs	Cronbach alpha	No of items
Perceived Benefits	0.971	20
Project Awareness	0.938	5
Feeling	0.731	4
Adoption Intention	0.948	5
IT Project Success	0.894	7

TABLE 6: FACTOR ANALYSIS – IT PROJECT SUCCESS

ROTATED FACTOR MATRIX – IT PROJECT SUCCESS		
	Factor	
	1	2
PS1	.808	
PS2	.780	
PS3	.743	
PS4	.695	
PS5	.651	
BS1		.944
BS2		.856
Eigen value	4.399	1.016
TVE	41.763	29.023

TABLE 7: FACTOR ANALYSIS – USER ATTITUDE

ROTATED FACTOR MATRIX – USER ATTITUDE					
	Factor				
	1	2	3	4	5
PB1	.855				
PB2	.836				
PB3	.803				
PB4	.800				
PB5	.791				
PB6	.766				
PB7	.760				
PB8	.727				
PB9	.717				
PB10	.710				
PB11	.709				
PB12	.705				
PB13	.660				
PB14	.647				
PB15	.613				
PB16	.603				
PB17	.587				
PB18	.576				
PB19	.575				
PB20	.537				
AW1		.803			
AW2		.791			
AW3		.779			
AW4		.662			
AW5		.648			
AD1			.856		
AD2			.822		
AD3			.802		
AD4			.780		
AD5			.766		
FL1				.754	
FL2				.647	
FL3					.632
FL4					.557
Eigen value	18.530	3.837	2.291	1.511	1.196
TVE	32.469	16.280	15.142	6.618	6.097

TABLE 8 : CORRELATION BETWEEN USER ATTITUDE VARIABLES VS IT PROJECT SUCCESS VARIABLES

Correlations		Dependant Variable		
Independent Variable		Project Success	Business Success	IT Project Success
Perceived Benefit	Pearson Correlation	.598**	.393**	.533**
	Sig. (1-tailed)	.000	.000	.000
	N	478	478	478
Project Awareness	Pearson Correlation	.658**	.502**	.633**
	Sig. (1-tailed)	.000	.000	.000
	N	478	478	478
Feeling	Pearson Correlation	.485**	.226**	.372**
	Sig. (1-tailed)	.000	.000	.000
	N	478	478	478
Adoption Intention	Pearson Correlation	.535**	.275**	.427**
	Sig. (1-tailed)	.000	.000	.000
	N	478	478	478

TABLE 9: REGRESSION ANALYSIS : RELATIONSHIP BETWEEN IT PROJECT SUCCESS AND USER ATTITUDE

Dependent Variable	Independent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate	F value	Unstandardized Beta	Sig. Value
IT Project Success	User attitude	0.633	0.401	0.399	0.406	318.122	0.845	0

DISCUSSION

The results showed a strong Pearson correlation among the variables perceived benefits (0.533) and project awareness (0.633) both correlating strongly with IT project success. This data in addition to the R-square and adjusted R-squared values of 0.633 and 0.401 indicate that there is a positive relationship between user's cognitive component and IT project success. Both variables perceived benefits and project awareness will influence the user's thinking process favourably towards the IT project.

EDUCATION

The data collection was based on three categories for level of education as shown in table 4. However, there were only 4 responses received from the group "Phd". For data analysis purpose, this group was combined as "Post Graduate & PhD". Considering that the basic education level sought within IT industry is graduation, the current study is anchored as less educated for "Graduate" and highly educated for "Post Graduate & PhD". A higher proportion of the sample assessed themselves as Graduates (n=245) and Post Graduate & PhD (n=233). According to the T test results there is significant difference between the perception amongst the less educated group Vs highly educated groups about the IT project success (p=0.000 and with T value being 3.547). The highly educated group is more positive about the IT project success than the less educated group. All means of responses from education group "Post Graduate & PhD" are higher than responses from group "Graduate". This is attributed to the factor that highly educated workers tend to adopt new technologies faster than those with less education. The IT project success partly depends on the human capital and their knowledge of the new technology and therefore increased levels of education raise the probability of early adoption and utilization of technology and therefore success of IT projects.

To summarise the findings, the results show similar findings compared to the previous studies related to relationship between user attitude and IT project success. The results also indicate that the findings are consistent with previous studies on significance of level of education with IT project success. The findings are consistent with the previous studies in suggesting that increased level of education significantly affects the IT project success.

TABLE 10: T-TEST: EDUCATION *5% LEVEL SIGN

	Education	N	Mean	Std. Dev	t-value	Sig.
Perceived Benefit	Graduate	245	3.988	0.384	0.199	0.842
	Post Graduate & PhD	233	3.979	0.51		
Project Awareness	Graduate	245	3.93	0.535	-1.254	0.211
	Post Graduate & PhD	233	3.993	0.57		
Feeling	Graduate	245	3.799	0.555	-0.341	0.733
	Post Graduate & PhD	233	3.815	0.497		
Adoption Intention	Graduate	245	4.154	0.482	0.213	0.831
	Post Graduate & PhD	233	4.145	0.463		
Project Success	Graduate	245	4.045	0.456	-2.168	0.031*
	Post Graduate & PhD	233	4.14	0.502		
Business Success	Graduate	245	3.851	0.735	-3.869	0.000*
	Post Graduate & PhD	233	4.092	0.62		
IT Implementation Climate	Graduate	245	3.934	0.371	-0.439	0.661
	Post Graduate & PhD	233	3.95	0.415		
IT Project Success	Graduate	245	3.948	0.517	-3.547	0.000*
	Post Graduate & PhD	233	4.116	0.519		

LIMITATIONS OF THE STUDY

- The scope of this research limits the inclusion of wider dimensions for cognitive and affective part of the user attitude.
- This study includes employees of Indian origin in Indian organisations only. This can be extended to all IT organisations where the Indian counterparts participate in the IT implementation projects.
- The study does not consider the different types of implementation projects.

KEY CONTRIBUTIONS OF THE STUDY

Important contributions of this study include:

- Understanding the perceptions of employees with different levels of education about the IT projects can help the organisations to prepare the project plan accordingly to cater to different groups and ensure that all impacted employees favour the IT implementation and thereby contribute to the success of the project.
- Change management activities such as training and communication plans can be built accordingly to increase the awareness amongst the less educated employees and increase their perception of the benefits, thereby enabling them to have favourable feeling and intention towards the IT project.

CONCLUSION

The results of this study show that the user attitude is indeed highly correlated with positive relationship with IT project success. In addition, level of education has a significant effect on the perception of IT project outcome. The study also found significant difference in the perception towards IT project outcome between employees who are only Graduates and employees with higher education level. Based on these findings, it appears that with increased education levels, there is higher probability of early adoption and utilization of technology and therefore favoring the success of IT projects

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