



## **THE ROLE OF INFORMATION TECHNOLOGY AND ITS IMPACTS OVER THE EMPLOYEE CREATIVITY IN THE SOFTWARE COMPANIES OF PAKISTAN.**

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## **Abstract:**

In this study, role of information technology has been discussed that how it impacts the employee's creativity. When it comes to connecting creative ideas and thoughts at the same time, information technology has both significantly helped and considerably hinders this capacity. This blending of technology has produced ground-breaking new concepts and ways for individuals to express themselves. This study is carried out in Pakistani software houses registered with stock exchange and it investigates the role of Information Technology (IT) in employee creativity. With the omnipresence of technology and technological advancement in the contemporary world, it is advantageous to study through different and advanced perspectives the profound effects on employee creativity. Conclusions and results point out significant effects of Information Technology on the creativity of employees.

**KEY WORDS:** *Information Technology, Employee Creativity, Organizations, Software Houses.*

The global community has become somewhat more accessible due to recent advancements in the online platform. It is obvious that there is still a clear absence of foundational concepts within which to grasp the potential of IT for tomorrow's businesses, despite the fact that IT has progressed from its traditional orientation of administrative support toward a more strategic position inside a company. Understanding how employee creativity develops is critical for organizations, in a world of rapid technological change and increasing business complexity.

This paper is trying to find out answer of few fundamental questions related to information technology and employee creativity in organizations. At first it discusses the role of information technology in the organizations and its impact over the employee creativity. Secondly, it discusses about the employee creativity and its basic elements. And finally, it discusses the interconnectivity between information technology and employee creativity.

Information technology now a day has become commonplace in organizations. Enterprise-wide systems created to manage all key organizational operations are examples of the many distinct types of software platforms and databases (Evans; Hickman; Kathleen; McKendrich; Menezes., 1999;1999; 1999; 1999; 1999.). IT encompasses a wide range of connectivity methods and equipment that interact with information systems and people containing voice mails, email, voice conferencing, internet groupware, corporate intranets, vehicle phones, fax machines, personal digital help, meta, and so on (Andolsen, R.Campbell, Edwards, Graham, Schober, 1999). Because of the frequent and close connections between these platforms, they will all be referred to together as IT in the remaining sections of this article.

Information technology is described having three main components: business software, computational information processing, and information assistance. Information technology involves things that have to do with computers, including connectivity/Networking, Hardware, Software, the Internet, and the people who use these tools.

Compared to conventional face-to-face communication, research indicates that IT improves the quantity of communication in the business overall (Hiltz, S. R., Johnson, K., & Turoff, M., 1986). The capacity to connect and empower individuals inside and across departments and units may be the most fundamental advantage associated with the usage of IT in organizations (Jones, Dewett &, 2001). IT has been efficient in enabling global group dynamics, which has enhanced team performance and creativity (Nemiro, 2001).

Creativity is the creation of innovative and practical concepts for goods, services, activities, and practices (Amabile, T. M. Oldham, G. R., & Cummings, 1996, 1996). Organizations must recognize the importance of creative ideas, as well as their role in guiding organizational members toward fostering employee creativity, in order to remain truly competitive. Different researchers stated that if enterprises want to gain a competitive advantage, they must improve the creative performance of their workforce (Amabile; Devanna & Tichy; Kanter; Shally. , 1988; 1990; 1983; 1985). The creative work environment offers fresh and practical solutions, Ideas, or methods and it provides vital raw materials for further growth, application, and development of an organization (Amabile; Staw; Woodman, Sawyer & Griffen; , 1988: 1990; 1993.).

The bulk of the information agrees that employee creativity is a human phenomenon impacted by parameters such as interpersonal qualities and life events (Gubta, 2011).

(Amabile, 1997) Support the statement that “creativity is an individual process” and also a statement “Creative outputs result when the potential creator and his functional environment connect”. Hence the statement provides a base that the functional environment has a role in supporting creativity. Since functional environment is composed of the equipment’s, tools and machines which are a key elements of the working context, it stands to reason that it has a significant impact on employees' creativity. Researches from the past demonstrate this relationship between functional environment and employee creativity (Gubta, 2011) (Ogbeibu, Senadjki, and Peng, 2018)

### **1.1 Research Objectives**

This thesis study is conducted to achieve new views in to organizations that how it employee creativity is impact by information technology. We have focused employee creativity mainly that how innovation and creativity in an organizations with the help of information technology is effected and how it contributes in the development of creativity thinking abilities of employees.

### **1.2 Research Question’s.**

- Q1. Role of information technology and its impact on employee creativity?
- Q3. Suitable technological platforms for employee creativity and motivation?
- Q4. How information technology fits into betterment and assist employees to wards creativity?

## CHAPTER 2: LITERATURE REVIEW

### 1.1 Information technology

The literature study focuses on the function of information technology in fostering employee creativity. The usage of electronic communication has been demonstrated to increase the overall volume of communication in the organization relative to face-to-face contact. This suggests what may be the most fundamental advantage of IT adoption and how employee creativity is influenced by the use of technology in businesses, and also attempts to highlight the relationship between technical application and its effects on creativity. Information technology and employee creativity has been the least subject of any practical study yet.

Information Technology has an impact on organizations and its employees by involving in their coordination process and operations. Cross-functional workflow (Monge, 1998), Stockless manufacturing (Piore, M. J., Lester, R. K., Kofman, F. M., & Malek, K. M., 1994), and concurrent engineering (Malone, 1992) have all been proved to benefit from IT use. Employees may access important information more easily and transparently as a result of growing online interdependencies, which also raise the frequency of problem-solving (Edmondson & Moingeon, 1998). According to boundary spanning, IT provides a company with significant information synergies and efficiency. IT allows employees to seek for and absorb fresh information that is pertinent to a current challenge, rather than only providing access to old knowledge as may emerge from knowledge codification (Tushman, 1977).

IT is an important but neglected means of facilitating the Creativity. This is because IT, controls how information is stored, transmitted, communicated, processed, and used. IT moderates many aspects of the process of putting "new problem-solving ideas into use."

### **1.2 Employee creativity**

Employee creativity is a multifaceted phenomenon. Integration of different and varied literature may aid in improved comprehension of the same. As a consequence, an integrated framework of employee creativity is suggested based on the exhaustive assessment of research and the resulting ideas.

The notion of the competitive value framework and the componential theory provides the basis to understand employee creativity with respect to different context. The componential theory of creativity is a comprehensive analysis of the social and psychological elements required for a person to be creative. Individual creativity is defined by the idea as having three primary components: 1. Personality Characteristics and self-efficacy, 2. Cognitive Characteristics, and 3. Motivation aspects (Amabile, 2012). Creativity is more likely to flourish where these elements intersect.

The Competing Values Framework is an approach for evaluating corporate success, loaded with current and prospective state evaluation outcomes. From the theoretical standpoint, comprehension of the primary organizational core principles will assist in comprehending how an environment influences employee career advancement performance. (Gubta, 2011), suggests that employee creativity is positively impacted by an environment that is future-focused and innovation-focused. This demonstrates that the conceptual foundations behind the link between environment and employee creativity are still a developing contradiction that demands careful consideration.

### **1.3 Hypothesis Development.**

To understand the role of information technology in employee creativity following Hypothetical assumptions were developed in this study.

#### **Effect of Information Technology on Employee's Creativity**

The invention of meaningful and practical new goods, services, concepts, methods, or activities by people cooperating in a complicated social system is referred to as creativity (Woodman, Sawyer & Griffin, 1993). Information technology is described as a system made up of different components, including smart chips, hardware, software, and telecommunication networks. In contrast to traditional face-to-face communication, electronic communication improves the amount of interaction that occurs overall in the company (Hiltz, S. R., Johnson, K., & Turoff, M., 1986). The capacity to communicate and allow individuals within and between functional areas, whether through database sources, teleconferencing, or electronic mail, may reflect this as the core value of IT use in enterprises (Dewett, T., & Jones, G. R, 2001). IT has various benefits for information, including the ability to store and retrieve massive amounts of data more quickly and affordably (Huber, 1990). It also offers personal independence and room for personal inventiveness to employees. According to researchers, in order to be creative, people need flexibility so that they can experiment with concepts and widen the range of materials and options from which a solution might emerge (Amabile, 1983). IT also provides employees with more freedom and capacity for initiative. According to researchers (Amabile, 1983), in order to be creative, people need the flexibility to experiment with theories and broaden the range of options and materials from which a solution may emerge. IT offers many informational advantages and also it offers

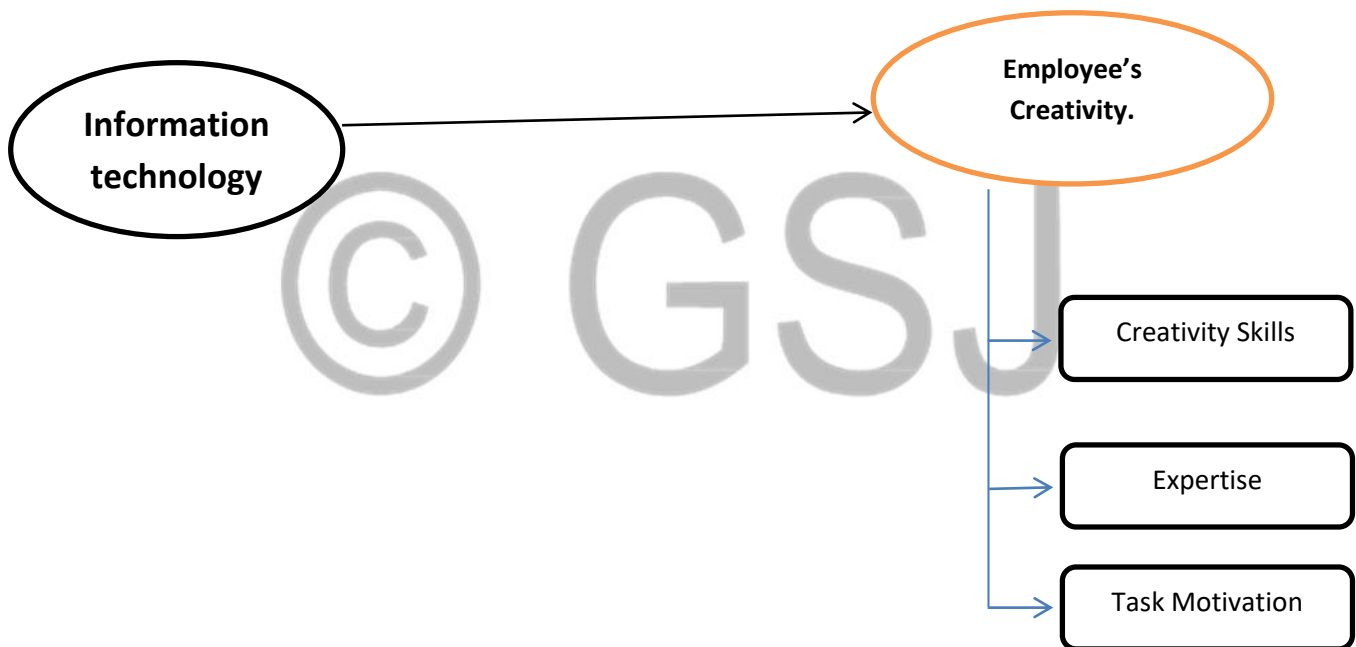


autonomy to the employees, this could promote a platform that could further encourage the integration of values and effective exchange of creative ideas.

**H1;** Information technology has a positive impact on employee creativity.

#### 1.4 Research Model.

Based on a survey of the literature and theoretical research done in the area, the conceptual model for the study was created.



#### 1.5 Theoretical Framework

Based on a survey of the literature and theoretical research done in the area, the conceptual model for the study was created. In this study Information technology is in independent variable whereas, Employees creativity is dependent variable, with the components creativity skills, Expertise and Task motivation. Creativity fosters with

creative skills, expertise and the task motivation and enables the employees to succeed at problem solving creatively. Creative skills are the abilities to approach a task or an issue in a fresh or novel manner or the capacity to use one's imagination to come up with novel ideas i.e. Curiosity, problem solving, open-mindedness and imagination. Expertise's are the wide range of knowledge and high level skill in a specific job, or doing a specific task in the best way. Finally task motivation is the behavior with motive to achieve targets, and maintain goals.

In order to strengthen managers' and professionals' understanding of the effects of IT on creativity, this research tried to establish a systematic framework for how IT may affect employee creativity. An integrative approach to this problem can open the door to evaluating IT, creativity, and the interactions between these two factors.



## CHAPTER 3: METHODOLOGY

### Introduction

This thesis study discusses the method that has been used in data collection which explains research questions of the study. The researcher will explain the purpose of the study, its methodology, design, and layout, as well as any ethical issues and, in the end, the rules for data collection.

### 3.1 Research Approach:

In this thesis study the deductive approach has employed and hypothesis develop on based of an existing concept before coming up with a research strategy to test it. This method is ideal for this study because it fits the circumstances where the goal of the investigation is to see if the observed events correspond to expectations based on previous research. This method may also be used using quantitative research methodology, even though the anticipation established by previous research may be represented in a different way than through speculative testing. The research approach was defined as a movement from general to specific. A well-established concept and knowledge foundation must first be established for this activity, following which the unique information gathered throughout the research process is assessed against it. Exact information for this work was gathered through study and other references. The case studies, publications, and reports that are the foundation of this research paper's strategy.

For this study past reports were analyzed and the possibility of I.T. in different organizations cultures is also studied. It also explains different W, & H's with respects to organizations, information technology and employee creativity.

### **3.2 Research Strategy and Design**

The research strategy explains how the plans are carried out in the studies. Exploratory work, journal articles, conversations, assessments, or a thorough review of the literature all can be employed for unique research projects. The purpose of the research layout is to offer a suitable framework for the proposed investigation. Determining how data will likely be acquired and which study design to uses is the most significant choice to be made (Gallivan M, Strite M, 2005, 2004). Yet, this research utilized a simple circuit design. Therefore, a singular approach is employed. The quantitative method which is thoughtful is employed in our study. The advantage of conducting primary research for this work is that the information acquired was up-to-date and relevant, allowing the right pattern to be discovered and giving us the data as our own. Another justification for conducting this research's survey online is that it is convenient and economical. The information used in this study was often gathered from articles, research reports, case studies, and websites devoted to data technology, innovation and creativity.

### **3.3 Variable Definition**

The questionnaire consist of 9 items inquires about how information technology impacts the employee creativity in different organizations of Pakistan. To ascertain the effects of information technology on the creativity of employee in different organization, statements from different researches have adapted (Igbaria, M., & Tan, M. , 1997) (Kaufman, 2012) (Runco: Plucker, J. A., & Lim, 2001) & Statements from the research of (Dobin, 2008) and items proposed to measure creativity were so helpful to carry out

this research. Few new question were included that asked about the age, Qualification, Gender, and job level of respondents. Using the ISCO ideas to protected job names, task and responsibility descriptions, skill level and specialty, and other components these items were established. The respondents to our question consist of lower level, Middle level, and Upper levels of job duties and responsibilities classification. Age (five classes: 20-25, 25-30, 30-35, 35-40, 40 and above) Qualification (Intermediate (5.57%), Bachelors (52.9%), master's (35.6%) M.Phil. (3.4), and P.H.D's (2.3%)) and gender (Male and female) were classifications of participants in the survey.

### **3.4 Participants**

The employees who took part in the survey had ages ranging from 20 to plus 45. Member with age of 20 and above self-identify as employed in a software house with minimum FSC certified from HEC were eligible for the study, during the cross-sectional survey for this paper the students and employees who are working with I.T. companies were therefore included. While participants had the opportunity to leave the study at any point, the decision was kept anonymous. The sample was drawn from the employees employed with different software houses registered with Pakistan stock exchange.

### **3.5 Sampling**

The targeted population of this study is companies registered under technology communication sector with the Pakistan Stock Exchange. In order to aid in obtaining a stratified proportionate sampling of employees in each software house, we used the G-Power software to help us determine the sample size and used stratified proportionate sampling technique to proportional the employees in each software house. This method is adopted to rectify the errors in sample selection and irregular population in different

companies and also it allows maximum flexibility to alter the sample size at different stages as per the requirements. 45 responses were appropriate and comprehensive.

### **3.6 Data collection and Questionnaire Items**

This study employed the use of a questionnaire which was prepared in English. A 5-point Likert scale ranging from strongly disagrees to strongly agree was employed. A pilot study of the items was done before the data collection and 16 colleagues took part in this study. Using SPSS software version 22.0, the pilot test results were examined. The results of the pilot investigation revealed that 10 out of 19 items packed below the required level. This left us with only 9 items in questionnaire.

The data for the research was collected by mailing to the employees. Purpose of research study was explained and the aims and objectives of the research were also share with the participants. Additionally, for this study contacts with the Human Resources Managers (HRM) of each software house were made as part of the actual data collection course.

### **3.7 Data Analysis**

Version 29.0 of the IBM SPSS Statistics program was used to analyze the data. The descriptive study examined the impact of information technology on employee creativity. Data for nominal and ordinal variables were displayed using absolute and relative frequencies. In order to demonstrate statistical independence with the result, we also conducted the Chi-square test (distress). In addition, several questions were used to generate logistic regression models. Crude and adjusted odds ratios were created using 95% confidence intervals (95percent C.I.s) (O.R.s). The research's data analysis was based on employees who worked in software houses registered with Pakistan stock exchange under technology and communication sector.

## **CHAPTER 4: RESULTS AND DISCUSSIONS.**

### **4.1 Quantitative Analysis**

The study here represents reliability statistics, frequency analysis, and correlation.

#### **4.1.1 Interpretation of frequency tables:**

The features of a collection of data in the study are represented using numbers and using different metrics. Recurrence analysis is aspect of unique insights. The recurrence of insights is refers to frequency of events repeated. Frequency Investigation examines percentiles, focal inclination, dispersion, and other aspects related to the frequency of occurrences as a part of observations (recurrence).

There are four columns of summary measurements in the frequency table:

- The frequency column indicates the number of observations that each grouping included.
- The percentage of all opinions that satisfy that category is presented in the Percent column (both absent and not missing).
- Out of all answers with no missing data, the valid Percent section displays the proportion of opinions that belong to this category.
- The cumulative Percent segment, which is calculated by summing each of the values in the Important Percent portion over the continuing column, discusses the overall level of the example that has been represented up to that line.

#### **4.1.2 What age are you?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-25	33	31.1	31.1	31.1
	25-30	57	53.8	53.8	84.9
	30-35	12	11.3	11.3	96.2
	35-40	4	3.8	3.8	100.0
	Total	106	100.0	100.0	

**Table01:** Ages of respondents.

The above table shows the age of the respondents. The total numbers of respondents are 106. Out of 106 respondents, the number of respondents who fall from 20-to 25 is 33. The number of respondents who falls in 25-30 is 57—the number of respondents who falls from 30 to 35 is 12. Same as the number of respondents who falls above 35 is 40 is 04. The cumulative percentage of respondents who fall between 20-25 is 31.00. Same as for 25 to 30, the cumulative percentage is 84.00. For 30 to 35, the cumulative percentage is 96.0, and for above than 35-40, the cumulative percentage is 100.

#### 4.1.3 Qualifications

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Intermediate	6	5.7	5.7	5.7



Bachelors	51	48.1	48.1	53.8
Masters	42	39.6	39.6	93.4
M.phil	5	4.7	4.7	98.1
PhD	2	1.9	1.9	100.0
Total	106	100.0	100.0	

**Table 02:** Qualifications of Respondents.

The above table shows the qualification of respondents. The total numbers of the respondent are 106. Out of 106 respondents, the numbers of respondents with intermediate qualifications are 6, number of bachelors is 51, the number of Master’s degree holder respondents is 42, 5 M.Phil. Students and two PhD students. The cumulative percentages of the respondent are 5.7, 53.8, 93.4, 98.1, and 100.

#### 4.1.4 Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	61	57.5	57.5	57.5
	Female	45	42.5	42.5	100.0
	Total	106	100.0	100.0	

**Table 03:** Gender.

The table above shows the gender of respondents participated in the survey. Out of 106 respondents 61 are Males with cumulative percentage of 57.5 and number of female respondent is 45 and cumulative percentage is 100.

#### 4.1.5 Job Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lower level	21	19.8	19.8	19.8
	Middle level	72	67.9	67.9	87.7
	Upper Level	13	12.3	12.3	100
	Total	106	100.0	100.0	

**Table 04:** Job Levels of respondents.

In this table the Job Level of respondent is shown comprises of 3 levels. Total number of respondent is 106 and all participants have responded to the survey. The number of respondents in lover level is 21, middle level is 70 and 13 with cumulative percent of 19.8, 87.7, and 100.

**H1;** Information technology has a positive impact on creativity.

#### 4.1.6 Correlations between information technology and creativity.

Result-oriented solutions for any situation are	Information technology Provides a wide range of connectivity between the
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creativity.

employee and the organization, Which helps to better understand the organization's dynamics.

Pearson Correlation	Result-oriented solutions for any situation are creativity.	1.000	.323
	Information technology Provides a wide range of connectivity between the employee and the organization, Which helps to better understand the organization's dynamics.	.323	1.000

**Table 08:** Information Technology and Creativity Correlation.

Table above explains the correlation between information technology and the employee creativity. Total number of respondents was 106 and all the 106 responses were reliable.

The correlation between both the variables is normal, hence our hypothesis is accepted.

#### 4.2 Sample Selection

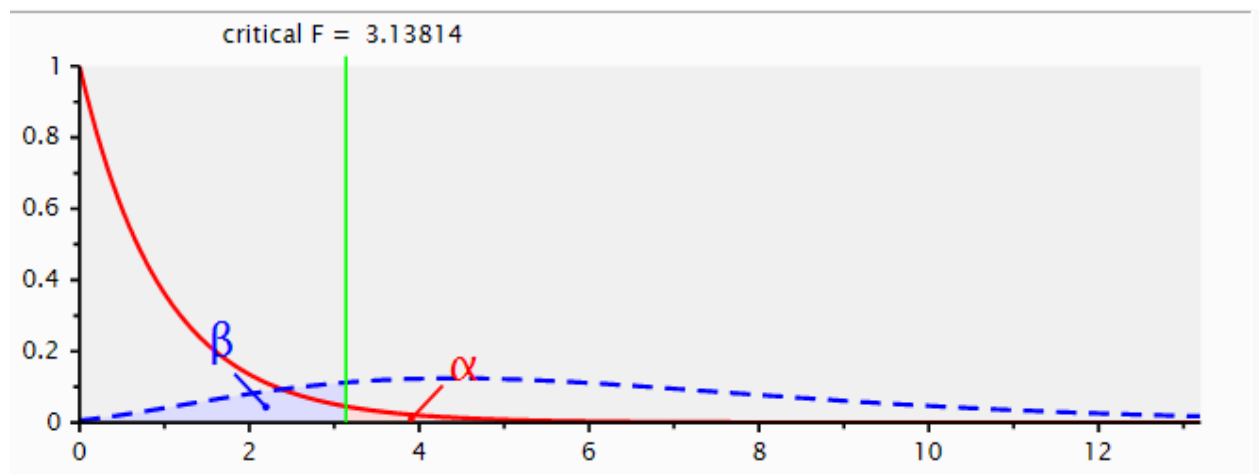
Input Parameters		Output Parameters	
Effect Size ( $f^2$ )	0.15	No centrality Parameter $\lambda$	10.200000
$\alpha$ error Probability	0.05	Critical Factor	3.1381419
Power ( $1 - \beta$ error Probability)	0.8	Numerator df	2

No. of Predictors	2	Denominator df	65
		Total sample size	68
		Actual Power	0.80144183

**Table 05:** Sample Calculation.

**Source:** G-Power

The above table explains the total sample size. After input of the data i.e. affect size,  $\alpha$  error Probability, Power ( $1 - \beta$  error Probability) and No. of Predictors. Total Number of predictors in my thesis were only 3. Sample size is determined as 77 also the critical factor is calculated as 2.7300187.



**Fig 02:** Sample Calculation

**Source:** G-Power.

## CHAPTER 5: CONCLUSION

This study discovers that information technology has positive and sustainable impacts on employee creativity. The results generally imply that, in today's global business environment, information technology has become essential to firms and their survival. It has enabled people from all walks of life to exhibit their considerable talents. The future of technology and creativity is set to climb even higher. According to authors of recent scientific research and consulting businesses technology has become essential in innovation as well as in the management and operations of the organizations.

### 5.1 Ethical consideration.

Ethical consideration is essential for the research. If this part of the research miss-lead it may show the way of failure. To avoid this failure, we will ensure research would not harm any of the participants and participant's self-respect whether they are willing to participate or not. We will make sure that research would use for academic purposes and, data will be confidential. We would ensure to avoid fake or false information by giving a brief detail of the questionnaire paper to participants. Clear and detailed information will provide to participants so that they can take part actively. The privacy of participant's will also be confidential. The usage of words and language in the questionnaire also takes from the ethical perspective. The institutional review board (IRB) and ethics committee of University will apply for ethical approval of the project.

THIS research procedure needs to be suitable for the cultural background of the anticipated study participants (E., Jacobsen, J. H, 2021).

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