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Change Management and Risk Assessment in IT Industry

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Abstract

Organizations adopt change to enhance their overall performance. To compete and survive in the ever increasing and changing market need, organizations need to be innovative for which adoption to change is required. Due to unique organizational change, the people within the organization may face a unique risk and their responses affect the objectives during change implementation process. The study is based upon qualitative and quantitative analysis for identifying and assessing the risk factors of change management process using Change Risk Assessment Model (CRAM), hierarchical model approach. The interviews are conducted for identification of top change risk factors from top professionals of IT industry and an optimal sample of 82 IT companies registered with Pakistan Software Export Board (PSEB) is selected. For qualitative analysis, the weights are assigned to each risk factor using CRAM questionnaire and for quantitative analysis, the AHP (Analytic Hierarchy Process) is used to assess the influence of each risk factor on the change. The present study not only focusses on the discussion of risk factors but also describes the risk mitigation strategies for ensuring success. The empirical results suggest that leadership is the key change risk factor followed by communication and training while user acceptance and security is found to be least important ones among the considered risk factors.

Key Words: Risk mitigation strategies; Analytic Hierarchy Process; Pakistan Software Export Board
Key Codes: C 54, G17, G32

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1. Introduction

Unstable environment gives rise to change within an organization that is the reaction to the unstable environment and an acquired strategy may also give rise to change (Paszkowski, 2017). The most important challenge for an organization is to survive in the innovative business world today. It must compete with the challenging and changing factors to bring change in the organization. Implementing a change is essential but it is a challenging task. Which risk factors affect the change? Which risk factors are more important to consider for the successful implementation of the change? These questions need to be addressed to get the insight of the successful implementation of change process.

Change needs to be managed continuously so that it may produce the expected results (Paszkowski, 2017). With the fastest growing and expanding Information technology (IT) sector of Pakistan from the increase in software exports to foreign markets there is a greater need to manage any possible risk and obstacles that could come in the way. It requires a system that could identify and assess the change risk factors successfully. Now, the investment in IT sector of Pakistan has been risen up to $5.138 billion and generates $3 billion revenue according to PSEB for the year 2016 (PSEB, 2016). From the increase in software exports to foreign markets there is a greater need to manage possible risks.

Due to uncertain conditions, the increase in advancements and technology is required to fulfil the ever-challenging need of the country. Therefore, this study tries to meet this criterion of identifying and assessing the change risks in the IT industry of Pakistan which would help in decision making processes of accepting the change or not. The empirical results suggest that leadership is the key change risk factor followed by communication and user acceptance while training and security is found to be least important ones among the considered risk factors.

2. Literature Review

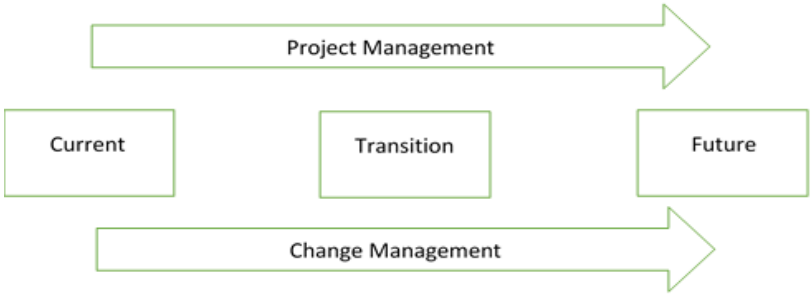
PMI (2013) defines project management as a phenomenon of sharing and experiencing skills, knowledge and using tools and techniques in all the activities of the project so that the objectives

are met by balancing all the constraints i.e. the planned time, cost, quality, scope, resources and risks. Change management deals with the organizational tools that can be used to help individuals to make successful personal transitions so that they can adopt and realize change successfully.

According to Chandra et al., (2009), the critical success factors of successful software development projects are corporate culture, decision time, control, personal characteristics, societal culture, customer satisfaction, collaboration and commitment, training and learning. Bradley (2016) points the reality of change in a way that the external environment will continue to accelerate due to change but those organizations will surely die who will remain without internal change. Hiatt and Creasey (2012) express that the change management is the accomplishment of objectives of the required change by dealing with the individual side of the progress which is critical to move people from the present state to the desired future state.

The Project management focuses basically on the tasks or activities to achieve the project objectives (Creasey, 2009; PMI, 2013) and change management focuses basically on the people which are influenced by the change. Both project management and change management deals with the movement of an organization from a current state to a future state (Carnall, 2003; Creasey, 2009). Change Management and Project Management are integrated practically as the Figure 1 shows below:

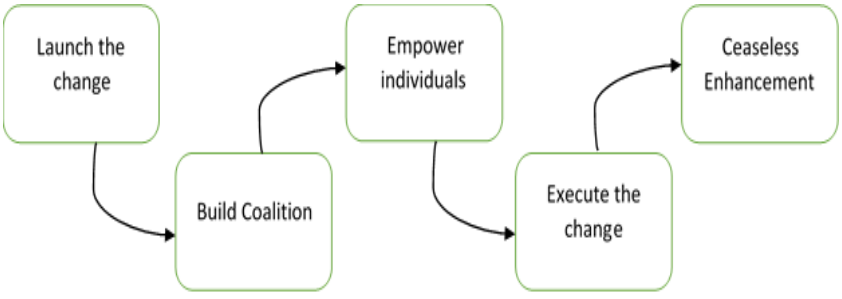
Figure 1
Transitional and Parallel Processes



Source: Carnall (2003) and Creasey (2009)

Unstable environment gives rise to change within an organization that is the reaction to the unstable environment and an acquired strategy may also give rise to change (Paszkowski, 2017). The change manager is needed to tempt, support and coordinate the unit managers of the organization, monitoring progress against the plan (Bradley, 2016). The smoothness of the execution of the change management is guaranteed by a few stages which are shown in the figure 2 below (Munassar et al., 2013).

Figure 2
Change Management Framework



Source: Munassar et al. (2013)

Change needs to be managed continuously so that it may produce the expected results (Paszkowski, 2017). In PRINCE2(R) (2009), risk is defined as an uncertainty of a final result and the risk management is to manage the vulnerability of the project to risk; the probability and the potential impact of risk occurrence. Also, the project brings about changes during its life cycle and which result in risks so the actual purpose of risk management is to identify, assess and control risk through the management of risk exposure to an acceptable way by counteraction in a cost-effective way in order to ensure the success of the project. According to PRINCE2(R) (2009, p.79), the risk management procedure consists of identify, assess, plan, implement and communicate risks where communication runs parallel to all of the four steps as prior to the completion of any process, the communication of the related findings needs to be done.

In PMBOK(R) Guide (2013), the knowledge area; Project Risk Management consists of the processes i.e. planning, identifying, analysing (quantitatively and qualitatively), planning response and controlling risks of the project so the actual purpose of risk management is to increase the probability and impact of positive events with decreasing the probability and impact of negative events of the project. The optimal objective of the project is overall success therefore changes cannot be avoided as they could have a great influence on the goals of the project since they affect the project processes. In software industry, the projects being involved require changes at two stages; at ideation and secondly at the structuring phase of the project (Ganeriwal, 2016).

Table 1
Change risk factors identified from literature

Change Risk factors	**Authors**
Resistance	Bradley (2016), Apostolopoulos et al. (2016), Waddell and Sohal (1998)
Communication	Bradley (2016), Apostolopoulos et al. (2016), Baca (2010)
Leadership	Paszkowski, 2017, Bradley (2016), Apostolopoulos et al. (2016), Kotter (1996)
Requirements	Apostolopoulos et al. (2016), Apostolopoulos et al. (2014b), Dunford et al. (2013)
Flexibility	Apostolopoulos et al. (2016), Dunford et al. (2013), Anders Ortenblad (2004)
Culture	Apostolopoulos et al. (2016), Gilley et al. (2009), Kanter (1985)
Monitoring	Bradley 2016, Apostolopoulos et al. (2016), Cicmil (1997)
Project Management Team	Bradley (2016), Apostolopoulos et al. (2016), Apostolopoulos et al. (2014a)

From the thorough review of existing literature, it is observed that there exist several risk factors which influence the process of change management in one or another way. Table 1 provides the factors that are identified in the existing literature by

several studies. It can be seen that the research on change management has not been done yet specifically for its risk assessment in the context of Pakistan. But organizations in Pakistan need to implement new changes that may be the new processes, technologies and structure mainly due to the greater competitive pressure.

To the best of our knowledge, there is no study been conducted giving a solid model on the change risks assessment in IT sector in Pakistan under contemporary project management frameworks but only the roots and factors of project failure or success are examined. The present study focuses on successful change management process in the IT sector of Pakistan.

2.2 CRAM and AHP Overview

Although the change managers, project managers and other stakeholders discuss about change and their associated risks but still there is a lot of room for improvement in this research area. Models within the research scope, are defined as the representation of interpreter's view about any concept from the real world (Wikstrom et al., 2010).

Change Risk Assessment Model (CRAM) is a novel modelling approach and consists of both qualitative and quantitative analysis to assist decision making process and its significance is that it could be applied to any type of project or organization, no matter what the size or complexity level is (Apostolopoulos et al., 2016). The method is so flexible that it could be modified to the specific customer specifications or expectations and to any case i.e. adding or deleting change risk factors according to the scenario (Apostolopoulos, 2014a).

CRAM questionnaire consists of the change risk factors which are identified after the interviews. Through this questionnaire, the weights are given by the professionals to the risk factors according to the importance they have on the change management process. The assessment of project change risks is being done with the help of Analytic Hierarchy Process (AHP) to define the internal dynamics of change management within project management which explains the risk cause-and-effect relationships. The hierarchy is composed of the goal or objectives

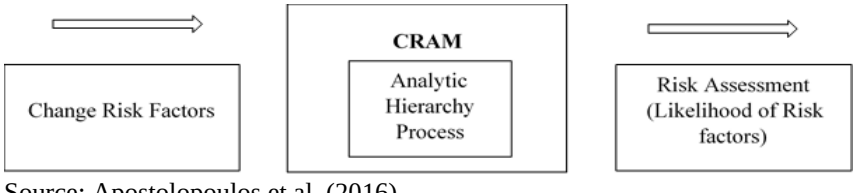
in first level followed by the criteria on which the subsequent elements depend and then the lowest level consists of a set of alternatives. Analytic Hierarchy Process (AHP) is a well-defined and structured multi-criteria hierarchical technique for which relative importance is determined via pair-wise comparisons to make complex decisions, first conceived by Saaty in the 1970s. It is being done by matrices which have the relative importance of each criterion relative to the others (Apostolopoulos et al., 2016).

3. Conceptual Framework

The framework of this research is dependent on the CRAM approach explained in Figure 3 below that describes the following steps;

a) Risk factors identification by conducting interviews
b) The influence of each risk factor on the change process is defined through CRAM questionnaire on which AHP is applied.
c) AHP is applied for risk assessment to attain the likelihood of each risk factor.

Figure 3
Research framework: CRAM's high-level diagram



Source: Apostolopoulos et al. (2016)

CRAM constitutes three main processes which are interrelated to each other. The three processes; Risk Identification, Risk Assessment and Risk Monitoring and Control are also shown in the Figure 4 below.

Figure 4
CRAM's Processes

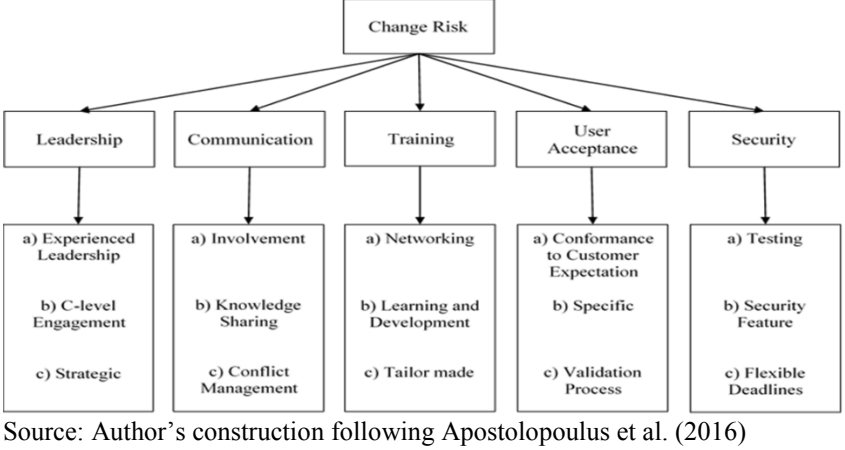
For the risk identification process, interviews are conducted from the top officials of IT companies being randomly selected. 10 professionals were contacted through emails for requesting them for interviews out of which only 6 showed a positive reply and therefore the meeting was set and being interviewed via personal visits or telephone call. For the risk assessment process of CRAM, AHP is used for the analysis of responses and attaining the results that guided to achieve the research objectives. The risk monitoring and controlling process is related to the assessment of responses and their potency. The methods for this process are identified during the interview phase of this research from the officials which are discussed under the heading risk mitigation strategies in the empirical results.

4. Methodology

The population frame consists of 104 IT companies registered with PSEB working in Islamabad/Rawalpindi.

Figure 5

CRAM hierarchy tree



Source: Author's construction following Apostolopoulus et al. (2016)

The data is collected via stratified sampling procedure in two phases. In the first phase, interviews are conducted, and questionnaire is formulated and in the second phase, data is collected using questionnaire. The sampling frame consists of project managers, team leads, CEOs, directors, developers and engineers. The treatment of scale selected is Saaty's (2008a) linear scale. The following figure 5 is the research model presented on the basis of interviews conducted from the top professionals of IT industry of Pakistan. It is a CRAM model approach in which the first level is change risks which represents the objective or goal to achieve. The second level (parent node) of the model consists of risk factors and the last level (child node) consists of the attributes of each risk factor. The risk factors as well as their attributes are identified by interviewing the IT companies located in Rawalpindi and Islamabad (twin cities of Pakistan).

5. Empirical Results

Demographics included in data to be collected to give an overview of targeted population of the interviews for this study are shown below:

Table 2
Demographics of Interviewees

Categories	Frequency	Percent	Cumulative Percent
Gender			
Female	1	16.67	16.67
Male	5	83.33	100
Total	6	100	-
Age (years)			
30-39 years	2	33.333	33.33
40-49 years	2	33.333	66.66
50-59 years	2	33.333	100
Total	6	100	-
Experience (in years)			
10-19 years	3	50.00	50.00
20-29 years	2	33.33	83.33
30-39 years	1	16.67	100
Total	6	100	-

The gender and age of the respondents via questionnaire for this study are shown in the following Table 3. The results show

that mostly the youngsters (up to 30 years) with 63.2% and people with 31 30 years with 36.8% are working in IT industry of Pakistan. The IT industry of Pakistan is growing and becoming need in every profession or field therefore the youngsters like to start their career from this industry. The IT industry mostly comprised of males which is shown by the results with 74.8% and females with low percentage of 25.2%.

Table 3
Demographics of Respondents

Categories	Frequency	Percent	Cumulative Percent
Age			
Up to 30 years	158	63.2	63.2
31 to 40 years	82	32.8	96
41 to 50 years	9	3.6	99.6
51 to 60 years	1	0.4	100
Total	250	100	-
Gender			
Male	187	74.8	74.8
Female	63	25.2	100
Total	250	100	-

Table 4 shows the frequency distribution of the respective job roles of the respondents via questionnaires. The respondents from higher position constitute 58.8%. It includes 8.8% of CEOs and directors, 7.2% project managers, 14.8% managers, 8.8% consultants and 19.2% leads whereas 41.2% people from low position.

Table 4
Job Roles of Respondents

Job role	Frequency	Percent	Cumulative Frequency
CEO	15	6	6
Director	7	2.8	8.8
project manager	18	7.2	16
Manager	37	14.8	30.8
consultant	22	8.8	39.6
Lead	48	19.2	58.8
developer	32	12.8	71.6
Engineer	71	28.4	100
Total	250	100	-

The Table 5 shows the frequency distribution of the experience of the respondents against the number of projects the respondents have worked in. 140 respondents having an experience up to 10 years worked with 10 or less number of projects which is a larger ratio whereas 21 respondents having an experience up to 10 years worked with more than 10 projects and 37 respondents having an experience above 10 years have worked with 10 or less number of projects whereas 52 respondents having an experience above 10 years have worked with more than 10 projects.

Table 5
Frequency Distribution of Experience against number of projects

	Number of Projects		
Experience (years)	**10 or less**	**More than 10**	**Total**
up to 10	140	21	161
above 10	37	52	89
Total	177	73	250

Table 6 shows the frequency distribution of the methodology of the firms against the firm type.

Table 6
Frequency distribution of Methodology used in firms against the firm type

	Firm Type		
Methodology	**small firm**	**large firm**	**Total**
PMBOK	14	6	20
Scrum	39	33	72
Agile	84	26	110
XPM	25	13	38
CMMI	5	1	6
SDLC	3	0	3
RAD	1	0	1
Total	171	79	250

The IT firms are divided into small firm and large firm categories on the basis of the number of employees in them. These small firm has been allotted to the firms having employees less than or equal to 300 whereas large firm to those having employees

greater than 300. The methodologies PMBOK3 (Project Management Body of Knowledge), Scrum4, Agile5, XPM6 (Extreme Project Management), CMMI7 (Capability Maturity Model Integration), SDLC8 (System Development Lifecycle) and RAD9 (Rapid Application development) are being given along with the firm size in order to inculcate which methodology is being used extensively or if it shows any pattern. A total of 20 respondents from both the firm claimed of using PMBOK. 39 respondents from a small firm asserted of using Scrum and 33 from a large firm use this methodology. Agile is the methodology that has a larger proportion out of 250 respondents and is being used in both firms as asserted by 110 respondents. 25 respondents from a small firm and 13 from large firm affirm of using XPM as a methodology for their firm whereas CMMI, SDLC and RAD are being used by a smaller ratio of respondents.

5.1 Descriptive statistics and reliability of measures

The Table 7 shows the descriptive statistics and the reliability results of all the risk factors presenting the value of α of Cronbach alpha test.

Since the data set contains outliers therefore the Interquartile Range (IQR) mentioned, summarizes the variability among the responses by giving an exact value. (IQR = 6) for User Acceptance is important over Security means that the User Acceptance is very strongly important over Security as the value

[3] PMBOK stands for Project Management Body of Knowledge, it is the set of standard guidelines for project management.

[4] Scrum is the framework used to manage the software development.

[5] Agile is the set of guidelines for software development.

[6] XPM used for managing the projects that are complex and unpredictable.

[7] CMMI stands for Capability Maturity Model Integration, it is used for managing the software development processes.

[8] SDLC stands for Systems Development Life Cycle, it is a model that elaborates the stages involved in information system development project. It is used in project management.

[9] RAD stands for Rapid Application Development, it is a methodology used for software application development.

of IQR is close to the scale = 7 (Very strongly important). The factors show good reliability of scale. Communication over Training (α = 0.922), Training over Security (α = 0.923) and Security over User Acceptance (α = 0.921) shows the consistency of the responses i.e. the responses are consistent and scale is reliable. The overall (α = 0.929) shows that the data as a whole is acceptable and valid.

Table 7
Descriptive Analysis and Reliability measure of Risk factors

Risk Factors		Mean	SD	Med.	IQR	Max	Min	Cronbach α
Leadership is important over	Communication	5.69	3.07	7.00	6.00	9.00	0.00	0.93
	Training	5.15	2.72	5.00	4.00	9.00	0.00	0.92
	User Acceptance	5.32	2.83	5.00	4.00	9.00	0.00	0.92
	Security	5.11	3.07	5.00	4.00	9.00	0.00	0.92
Communication is important over	Leadership	0.32	0.95	0.00	0.00	9.00	0.00	0.93
	Training	4.94	3.03	5.00	4.00	9.00	0.00	0.92
	User Acceptance	4.82	3.01	5.00	6.00	9.00	0.00	0.92
	Security	4.51	3.00	5.00	6.00	9.00	0.00	0.92
Training is important over	Leadership	0.32	1.02	0.00	0.00	7.00	0.00	0.93
	Communication	0.70	1.88	0.00	0.00	9.00	0.00	0.93
	User Acceptance	4.63	2.85	5.00	4.00	9.00	0.00	0.92
	Security	4.17	2.98	5.00	6.00	9.00	0.00	0.92
User Acceptance is important over	Leadership	0.45	1.44	0.00	0.00	9.00	0.00	0.93
	Communication	0.80	2.09	0.00	0.00	9.00	0.00	0.93
	Training	0.57	1.54	0.00	0.00	9.00	0.00	0.93
	Security	4.21	3.06	5.00	6.00	9.00	0.00	0.92
Security is important over	Leadership	0.56	1.52	0.00	0.00	9.00	0.00	0.93
	Communication	0.83	1.92	0.00	1.00	9.00	0.00	0.92
	Training	0.79	1.67	0.00	1.00	9.00	0.00	0.92
	User Acceptance	0.85	1.84	0.00	1.00	9.00	0.00	0.92
Total Scale								0.93

Note: The total number of observations are 250

5.2 Analysis of change risk factors and their attributes using AHP

Every matrix for each respondent is computed by the calculation method of AHP for checking whether all the matrices i.e. the priorities being assigned by the respondents are valid or not. For each response, there is to be a matrix therefore for 250 responses for the quantitative analysis of risk factors, 250 matrices are made and for each risk factor in order to analyse their attributes, further 250 matrices are made for each of them. The consolidated matrix is made after the verification of consistency of all the matrices.

Each element is of the consolidated matrix is equal to the geometric mean of each element of all the matrices. Let C be the consolidated matrix then its element c11 is shown as below;

$$c11 = \sqrt[n]{a11 * b11 * d11 * \dots n11}$$

c11 is the element at the first row and first column of the consolidated matrix, a11, b11, d11 and n11 are the elements at the first row and first column of matrix first matrix A, second matrix B, third matrix D and last matrix N. n is the total number of matrices.

$$C = \begin{bmatrix} 1.00 & 3.08 & 4.04 & 3.17 & 3.11 \\ 0.32 & 1.00 & 2.93 & 1.56 & 1.65 \\ 0.25 & 0.34 & 1.00 & 1.58 & 1.67 \\ 0.32 & 0.63 & 0.63 & 1.00 & 2.10 \\ 0.32 & 0.61 & 0.59 & 0.47 & 1.00 \end{bmatrix}$$

The consolidated matrix along with the risk factors can be presented in a tabular form. The eigen value λ max is to be calculated for evaluating the consistency of results using CR. For computing the likelihood of each risk factor, the matrix C needs to be normalized.

Table 9 shown below presents each parent node along with its child nodes in which the likelihood and consistency of each risk attribute is indicated.

Table 8
Consolidated Matrix (Parent Node)

Risk Factors	Leadership	Communication	Training	User Acceptance	Security	Likelihood
Leadership	1.00	3.08	4.04	3.17	3.11	43.41
Communication	0.32	1.00	2.93	1.56	1.65	20.30
Training	0.25	0.34	1.00	1.58	1.67	13.20
User Acceptance	0.32	0.63	0.63	1.00	2.10	13.44
Security	0.32	0.61	0.59	0.47	1.00	9.64
Total						100.00
λmax = 5.214		CR =4.8%				

Table 9
Likelihood and Consistency Ratio of Child node

Risk Factors	Attributes	Likelihood (%)	Eigen Value (λmax)	Consistency Ratio (CR)
Leadership	Experienced Leadership	58.75%	0.07	11.73%
	C-Level Engagement	30.75%		
	Strategic Leadership	10.50%		
Communication	Involvement	65.45%	0.05	9.39%
	Knowledge Sharing	21.35%		
	Conflict Management	13.20%		
Training	Networking	66.07%	0.03	6.02%
	Learning and Development	19.76%		
	Tailor made	14.17%		
User Acceptance	Conformance to customer expectations	63.82%	0.06	10.11%
	Specific Requirements	22.81%		
	Validation Process	13.37%		
Security	Testing	65.99%	0.03	5.80%
	Security feature	19.95%		
	Flexible deadlines	14.06%		

The likelihood in the Table 9 shows the consistency among the responses received through questionnaire. 5.80% corresponds to CR=0.058 that is less than the acceptable limit of CR i.e. 0.1 therefore responses received for the attributes of Security show consistency.

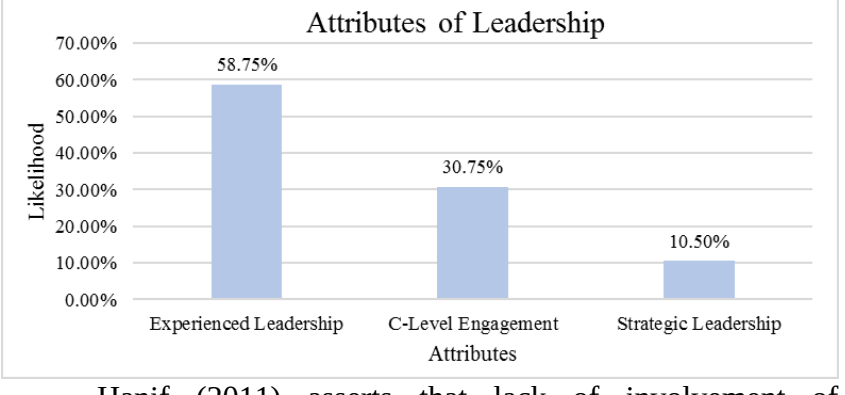
The further section describes the analysis of risk factors and their attributes that goes far beyond the conventional approach of cost, time, quality and scope constraints.

5.3 Risk Factors and their Attributes

Leadership is senior management accountability and support. Soderlund and Maylor (2012) indicate lack of support and commitment to be the behavioral issues from senior management. Leadership is the top most influential risk factor with 43.41% along with the attribute Experienced Leadership (23.54%), C-Level Engagement (13.03%) and Strategic Leadership (6.85%).

Figure 6

Attributes of Leadership



Hanif (2011) asserts that lack of involvement of stakeholders is one of the cause of failure. The figure 7 shows the attributes of Communication with their likelihood: Involvement (11.69%), Knowledge Sharing (5.60%) and Conflict Management (3.01%).

Figure 7
Attributes of Communication

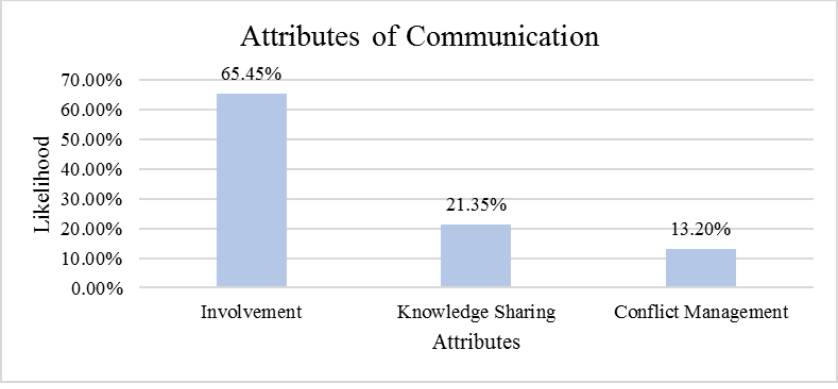
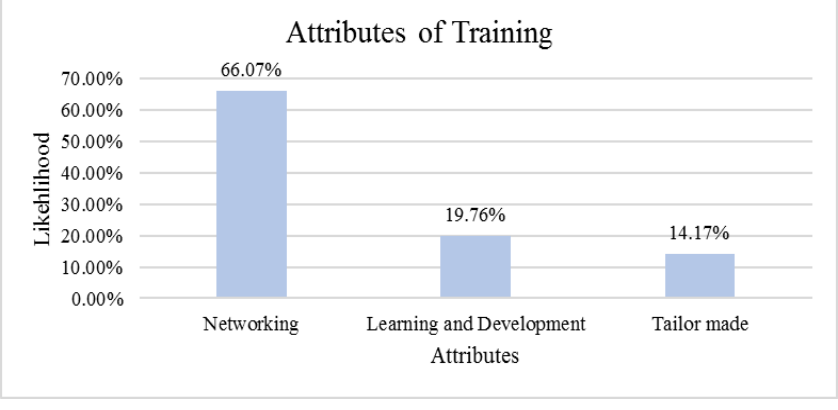


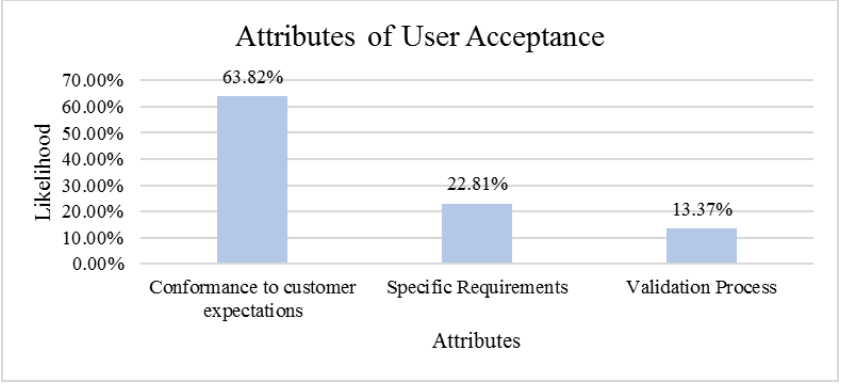
Figure 8
Attributes of Training



Soderlund and Maylor (2012) indicate the organizational issues to be the lack of training. The attributes of training along with their likelihood are Networking (66.07%), Learning and Development (19.76%) and Tailor made (14.17%) as shown in figure 8.

User Acceptance is the set of conditions or requirements set by a user or client. Development directs to productivity and this direction adjusts with the changing requirements (Turpe and Poller, 2017).

Figure 9
Attributes of User Acceptance

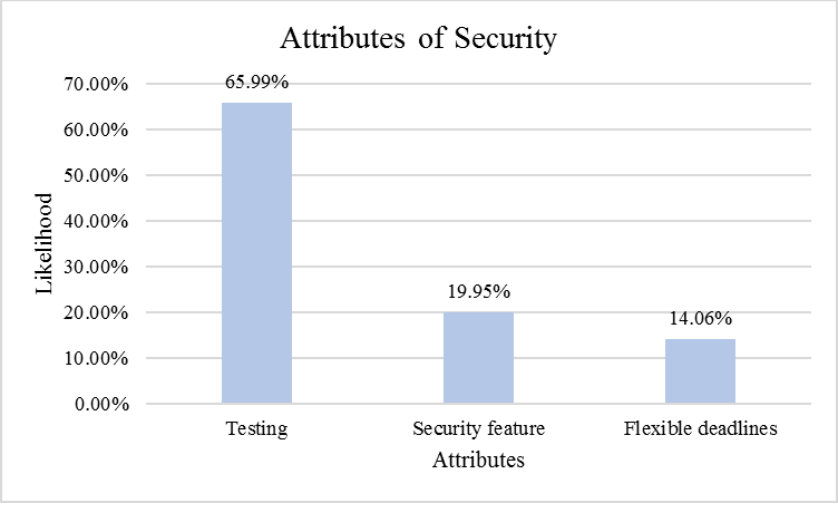


According to the results shown in figure 9, User Acceptance is ranked third (13.44%) among all the risk factors based on the relative importance. The attributes are conformance to customer expectations (63.82%), Specific requirements (22.81%) and Validation Process (13.37%).

Security indicates that if the planning phase and proper concern to the vulnerability are neglected, the change process may not only lead to failure but could harm the organization rather than proving beneficial. The processes being involved in change management are the planning, managing and reinforcing change (McCarthy, 2010).

Security is the risk factor being identified through interviews and has no existence in literature as a change risk factor. The attributes are also being focused based on the discussion in interview phase of the present study. The testing alludes to the experiment or trial of the change processes before they are implemented finally. The vulnerability to hackers is the attribute of security as it could harm the confidential data of the organization and must be observed carefully. The third attribute of security is flexible deadlines i.e. if the planning is taking maximum time and delaying the project execution.

Figure 10
Attributes of Security



The last ranked risk factor is Security (9.64%) and the attributes with their likelihood are testing (65.99%), Security feature (19.95%) and Flexible deadlines (14.06%).

5.4 Risk Mitigation Strategies

One of the questions in interview was to identify or explain the risk mitigation strategies or methods to overcome the change risks. The following are the methods being ascertained by the professionals of IT industry of Pakistan. Table 9 shows the risk mitigation strategies.

The problems related to management and risk analysis have been strived to address by the project management methodologies but not the risk assessment modelling or change risk management. Considering the change in three constraints i.e. time, scope and cost to be the cause behind risk is the most common approach. Since no project is there without risk in a real-world scenario therefore in the same way all these constraints cannot be balanced completely (Apostolopoulus et al., 2016).

Table 9
Risk Mitigation Strategies

S. no.	Change Risk factors	Risk mitigation strategies
1	Leadership	Reviewing the strategic standards, change management or steering committee to resolve issues within the organization so that by the time they may not shape into risks.
2	Communication	Meetings to convey the information related to change or risks, Decentralization to give people power of attorney so that they may get more involved within the change process and own it.
3	User Acceptance	Reassessment to ensure if the change result is same as planned
4	Training	Lessons learned report
5	Security	Involving employees in decision making, Better planning, Risk Auditing

6. Key Findings

The leadership is risk factor being ranked at first. The leadership embodies the senior management. Communication is ranked second among risk factors. Conveying information in very important for the definition and execution of change process. The results show user acceptance to be a slightly more crucial factor than training which incurs that both need to be considered at the same time and only a slight more concern of user acceptance can eradiate and help overcome the training risk. According to the results, security has the lowest likelihood percentage but it is an important factor as it is related to the core of business being linked with the security of systems or processes of the organization.

Out of five, the four key risk factors are mentioned in many studies in literature (see for example; Jerzy Paszkowski (2017), Apostolopoulus et al. (2016), Whelan-Berry & Somervile (2010), Adedayo (2010), Taylor (2006), Goodman and Truss (2004), Keil et al. (1998), Artto (1997). Our empirical findings are in line with the studies of Adedayo (2010) and Apostolopoulos et al. (2016) as Adedayo (2010) listed top 10 factors among which

leadership is ranked first and communication at fifth. The results of Apostolopoulus et al. (2016) are in line with the present study except Security. Each of the four key risk factors are mentioned in one or the other study as Bradley (2016) mentions all of them except User Acceptance (Requirements), Balogun and Hope Hailey (2008) discuss all the factors except Communication, Mulcahy (2013) discusses only one factor i.e. Communication. But no study highlights Security as a change risk factor which is the fifth important risk factor. Therefore, the innovation of our fifth risk factor is the point where our study contrasts with the existing literature.

7. Policy Recommendations

Our main focus is IT industry of Pakistan for the identification of change risk factors that provides the useful insight for successful implementation of change. The facts and figures presented by the study are realistic in nature as the base of the results is the interviews conducted from professionals of IT industry. Therefore, they are useful for the IT sector of Pakistan in recognizing the risks and survive in the innovative business world. The risks assessment of change is therefore a necessary process for implementing the change successfully. This research benefits the IT sector of Pakistan and people associated with it by highlighting the key risk factors along with their attributes and assessing their impact on the successful implementation of change.

The order of importance for risk factors aids the concerned people of IT sector to control and examine the risks according to their rank and smoothly manage the risks. The risk mitigation strategies provided by the present study bring support in controlling the risks and eliminating them. In order to accord more into the revenue and provide better services, the present study would play a significant role. By skillful management and effective planning, risks can be handled perfectly to ensure success.

8. Limitations

Overall, the five risk factors based on their discussion from the professionals of the IT industry are selected and they proved

to be the most important ones in the change process. Despite these factors there are other too to be considered and studied for further assistance in change process.

The interview session and the data collection via questionnaires were done only in two cities of Pakistan. Although the Islamabad being the capital of Pakistan has a greater significance to be selected. Being a student, managing cost for travelling for interviews and getting the questionnaires filled was quite a difficult task.

9. Future Recommendations

The change management process is practiced in other fields also in one or another way. Projects are being done in every field. The risk factors studied in the present research could be used focusing some other sectors as well as across Pakistan and even a comparison can be done with the same sectors with other similar countries.

The association and variation among the risk factors of change process can be studied. For the analysis of risk factors, AHP is being used in the present study whereas many others could be focused.

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