Nat. Volatiles & Essent. Oils, 2021; 8(4): 15570-15582

NVEO
Natural Volatiles &
Essential Oils

Factoral Influences On Sustainable Risk Management Practices In It Industry

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Abstract

Purpose: To identify the factors which influence risk management practices in Information technology industry. To investigate and analyze the prominent factors causing risk management in IT industry.

Approach: Data was collected from 67 IT employees who are having more than three years of experience in IT projects based on convenience and snow ball sampling from Information Technology Companies located in Hyderabad who have been listed in NASSCOM. The hypotheses have been formulated and tested using SPSS software and the results have been arrived at.

Findings: The results from statistical analysis of the data indicate that in the IT organizations at all levels, cost of project, project schedule, project team, technological environment, organization culture and client are important factors that have been identified from the study believed to instill risk management at all levels irrespective of the designation.

Practical implications: It enables one to understand factoral influences on risk management practices. IT Organizations which intend to introduce or improve risk management in the organization can inculcate these practices into their organizational culture.

Originality/value: Although there does exist literature for identifying the factors of risk management, limited literature could be found focusing on factors which influence risk management in IT industry. This study may serve as a point of reference for future studies in this area of concern.

Index Terms - Sustainability, Organization, Information technology, risk management practice and IT employee.

Introduction

In present scenario, IT organizations are following the sustainable risk management strategies to run their activities within socio-economic constraints. The risk is involved in every business activity in different forms (Osuszek and Ledzianowski 2020; Tiwari and Suresha 2021). IT organizations have no

exception in this risk. Information technology is one of the primary industries in the Indian economy. The IT industry has brought financial growth and success for the emerging economy in India.

Hyderabad is well known as one of the best IT/ITES hub of India with large companies such as Amazon, Google, Microsoft, Infosys, TCS, Genpact, Deloitte, Facebook, Bank of America, Thomson Reuters, Cognizant and Franklin Templeton among others are growing their presence in the Telangana. According to IT department report released by Chief Minister's office (CMO), Telangana has registered 17.93% growth in IT exports for the year 2019-2020 over the previous year's growth (2018-2019). This number is more than the double the national average 8.09% and more than two and half times the rest of nation. i.e. 6.92%. (Source : "Telangana records 17.93 % growth in IT sector". The Times of India. 21 May 2020. Retrieved 25 October 2021).

Risk identification is of old concept used to explore various ways to prevent unfavorable situations for the well-being of humanity (Crockford 1982). The development of risk management and important functions concerned with risk management has evolved from past many years (Biolcheva 2020). Risk management helps IT executives to take accurate decisions to manage risk and to protect projects though the risk cannot be eliminated completely.

Objectives of the study

- To study the risk management practices in Information technology industry.
- To identify and analyze the factors which influence risk management practices in IT industry.
- To know the impact of impact of risk management on IT employees.
- To suggest certain steps for improvement of risk management in IT industry.

Research methodology:

Sources of the Data: As this is investigative study, the data comprises of both primary and secondary sources. The Primary data was collected through a structured questionnaire by distributing to Software IT employees who are in project and having three and more years experience working in IT organizations in and around Hyderabad. The secondary data has been collected from journals, magazines, books and websites.

Sampling method used: Data was collected from 67 IT employees based on convenience and snow ball sampling from Information Technology Companies located in Hyderabad who have been listed in NASSCOM.

Statistical tools used: The hypotheses have been formulated and tested using SPSS software and the results have been arrived at.

Statistical analysis

To test the reliability of data, the data collected was subjected to cronbach's alpha test. The results were

Reliability

Reliability Statistics

Cronbach's Alpha	N of Items
.462	24

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
40.22	16.873	4.108	24

Inference: Cronbach's alpha has been run for to check their reliability. The above table displays some of the results obtained. The overall alpha for the all items is 0.462, which is very high and indicates strong internal consistency among the given items.

Factor Analysis: Factor analysis was done in order to obtain factors with the greatest factor loading value. The results obtained were:

	Mean	Std. Deviation	Analysis N
Leadership effectiveness	1.40	.579	67
Encouragement	2.00	.718	67
Organizational policy	1.18	.386	67
Organizational Culture	1.52	.533	67
Working condition	1.30	.461	67
Project team	1.25	.438	67
Performance deadlines	2.31	.763	67
Co-operation at work	1.46	.636	67
Cost of Project	1.97	.984	67
Project Schedule	1.97	.984	67
Team work	1.97	.834	67
Internal communication	2.30	.835	67
Transparency	1.52	.682	67
Feedback	1.30	.461	67
Incentives	2.07	.502	67
Compensation system	2.03	.521	67
Reward system	1.31	.467	67

Technological environment	1.25	.438	67
Workload	1.91	.753	67
Individuality	2.07	.502	67
Decision making	2.03	.521	67
Client	1.52	.533	67
Top management support	1.30	.461	67

Total Variance Explained

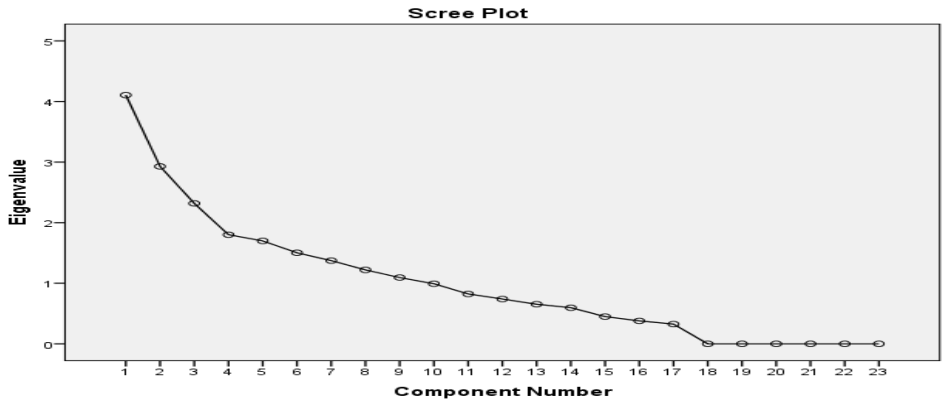
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.106	17.852	17.852	4.106	17.852	17.852	2.539	11.039	11.039
2	2.928	12.731	30.583	2.928	12.731	30.583	2.378	10.340	21.378
3	2.318	10.079	40.661	2.318	10.079	40.661	2.197	9.553	30.931
4	1.801	7.830	48.491	1.801	7.830	48.491	2.143	9.320	40.251
5	1.699	7.386	55.877	1.699	7.386	55.877	2.135	9.284	49.535
6	1.503	6.533	62.410	1.503	6.533	62.410	2.121	9.224	58.759
7	1.373	5.970	68.381	1.373	5.970	68.381	1.812	7.876	66.636
8	1.220	5.305	73.686	1.220	5.305	73.686	1.440	6.262	72.898
9	1.094	4.758	78.444	1.094	4.758	78.444	1.276	5.546	78.444
10	.992	4.313	82.757						
11	.823	3.579	86.336						
12	.740	3.215	89.552						
13	.654	2.842	92.394						
14	.596	2.592	94.986						
15	.449	1.953	96.939						
16	.379	1.646	98.585						
17	.325	1.415	100.000						
18	4.799E-016	2.086E-015	100.000						
19	3.130E-016	1.361E-015	100.000						
20	1.145E-016	4.976E-016	100.000						
21	-1.466E-016	-6.372E-016	100.000						
22	-4.710E-016	-2.048E-015	100.000						
23	-2.914E-015	-1.267E-014	100.000						

Extraction Method: Principal Component Analysis.

Factor: The initial no. of factors is the same as the no. of variables used in the factors analysis. However not all 23 factors will be retained. In this example only the first 09 factors will be retained since their Eigen value is greater than1.

Initial Eigen values: Eigen values represent the variances of the factors.

TOTAL: This column contains the Eigen values. The first factor will always account for the maximum variance and the next factor will account for lesser variance compared to the first factor as observed and so on. Hence each successive factor will account for lesser and lesser variance.



The scree plot plots the Eigen values against the corresponding factor. One can see these values in the first two columns of the table immediately above. From the third factor on, you can see that the line is almost flat, meaning the each successive factor is accounting for smaller and smaller variation in the data.

Component Matrix[a]

	Component								
	1	2	3	4	5	6	7	8	9
Leadership effectiveness								.537	
Encouragement				.606					
Organizational policy									
Organizational Culture		.722							
Working condition	.612								
Project team		-.619	.544						
Performance deadlines								.507	
Co-operation at work									
Cost of Project	.652								
Project Schedule	.652								
Team work	.606								
Internal communication									
Transparency									.548
Feedback				.677					

Incentives	-.577				.557				
Compensation system	-.622		.521						
Reward system									
Technological environment		-.619	.544						
Workload									
Individuality	-.577				.557				
Decision making	-.622		.521						
Client		.722							
Top management support	.612								

Extraction Method: Principal Component Analysis.

a. 9 components extracted.

Rotated Component Matrix[a]

	Component								
	1	2	3	4	5	6	7	8	9
Leadership effectiveness									.594
Encouragement							.604		
Organizational policy							-.508		
Organizational Culture			.952						
Working condition						.948			
Project team		.952							
Performance deadlines							-.522		
Co-operation at work									-.738
Cost of Project	.949								
Project Schedule	.949								
Team work	.601								
Internal communication									
Transparency								.813	
Feedback							.716		
Incentives					.923				
Compensation system				.897					
Reward system							.506		
Technological environment		.952							
Workload								.666	
Individuality					.923				
Decisionmaking				.897					
Client			.952						

Top management support						.948			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 12 iterations.

S.NO	Factor name	Factor loading
1	Cost of project and Project schedule	0.949
2	Project team and technological environment	0.952
3	Organizational Culture and Client	0.952
4	Participative decision-making and Compensation system	0.897
5	Incentives and individuality	0.923
6	Top management support and working condition	0.948
7	Feedback	0.716
8	Transparency	0.813
9	Leadership effectiveness	0.594

The PRINCIPAL COMPONENT MATRIX gives the component matrix which is rotated using the VARIMAX rotation technique which gives the ROTATED COMPONENT MATRIX. Rotation of factors helps in the better interpretation of factors. Since the first factor in the ROTATED COMPONENT MATRIX is heavily loaded with training and ongoing.

Factor loading Value of 0.949 which is the highest for the first factor the first factor represents cost of project and project schedule. The second factor is heavily loaded with Project team and technological environment (0.982) hence factor 2 represents Project team and technological environment and thus the subsequent factors can be interpreted based on their Eigen value. The final list of 09 factors which collectively account for 78 % of the variance in the data is shown below.

Data was collected from 67 IT employees based on convenience and snowball sampling from Hyderabad Campuses of Information Technology Companies who have been listed in NASSCOM. The hypotheses which have been formulated are tested using SPSS software and the results have been arrived at.

Hypotheses:

1. Cost of project: In the literature of project management, cost is expressed as monetary value (Frame 2002). Cost management in project is important and it includes the process of resource planning, estimation of project, budgeting and controlling of the project within the approved budget.

HO: There is no significant association between designation and employee's opinion towards the cost of project.

Crosstab

			Cost of project			Total
			Strongly disagree	disagree	agree	
Designation	Analyst programmer	Count	11	9	0	20
		% within Designation	55.0%	45.0%	0.0%	100.0%
	Assoc Consultant	Count	10	10	1	21
		% within Designation	47.6%	47.6%	4.8%	100.0%
	Manager	Count	8	7	0	15
		% within Designation	53.3%	46.7%	0.0%	100.0%
	Systems Engineer	Count	4	7	0	11
		% within Designation	36.4%	63.6%	0.0%	100.0%
Total		Count	33	33	1	67
		% within Designation	49.3%	49.3%	1.5%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.325[a]	6	.767
Likelihood Ratio	3.449	6	.751
N of Valid Cases	67		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .16.

From the above table chi square is not significant (sig. value is greater than 0.05), no evidence to reject null hypothesis. It means that there is no significant association between designation and their opinions towards the cost of project.

2. Project schedule: The project schedule plays a major role in success of a project. Detailed project schedule is required for understanding and mitigating the project risk. In the project schedule, there are chances of risk in areas of estimated durations, assumptions made which may turn out to be inaccurate.

HO: There is no significant association between designation and employee's opinion on effectiveness of project schedule.

Crosstab

			Project Schedule				Total
			Strongly disagree	disagree	agree	Strongly agree	
Designation	Analyst programmer	Count	11	5	4	0	20
		% within Designation	55.0%	25.0%	20.0%	0.0%	100.0%
	Assoc Consultant	Count	10	4	7	0	21
		% within Designation	47.6%	19.0%	33.3%	0.0%	100.0%
	manager	Count	6	2	6	1	15
		% within Designation	40.0%	13.3%	40.0%	6.7%	100.0%
	Systems Engineer	Count	3	1	5	2	11
		% within Designation	27.3%	9.1%	45.5%	18.2%	100.0%
Total		Count	30	12	22	3	67
		% within Designation	44.8%	17.9%	32.8%	4.5%	100.0%

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.947[a]	9	.279
Likelihood Ratio	10.984	9	.277
N of Valid Cases	67		

a. 11 cells (68.8%) have expected count less than 5. The minimum expected count is .49.

From the above table chi square is not significant (sig. value is greater than 0.05), no evidence to reject null hypothesis. It means that there is no significant association between designation and their opinions on project schedule.

3. Project team: Though project manager is primarily responsible for risk management in project, it's a collective responsibility of all employees who involved in the project. The project team should be competent to handle risk assessments effectively. The team must be pro-active, coordinate and address risk challenges involved in project.

HO: There is no significant association between designation and their opinions on efficiency of project team in risk management.

Crosstab

			Project team			Total
			Strongly disagree	disagree	Agree	
Designation	Analyst programmer	Count	1	15	4	20
		% within Designation	5.0%	75.0%	20.0%	100.0%
	Assoc Consultant	Count	2	16	3	21
		% within Designation	9.5%	76.2%	14.3%	100.0%
	Manager	Count	3	11	1	15
		% within Designation	20.0%	73.3%	6.7%	100.0%
	Systems Engineer	Count	0	8	3	11
		% within Designation	0.0%	72.7%	27.3%	100.0%
Total		Count	6	50	11	67
		% within Designation	9.0%	74.6%	16.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.274[a]	6	.509
Likelihood Ratio	5.904	6	.434
N of Valid Cases	67		

a. 8 cells (66.7%) have expected count less than 5. The minimumexpected count is .99.

From the above table chi square is not significant (sig. value is greater than 0.05), no evidence to reject null hypothesis. It means that there is no significant association between designation and their opinions on project team efficiency in handling the risk management in project.

4. Technological environment: Technology plays a major role in success and failure of the project. Even, the technology enhances the quality of the project. The technological environment supports the project with better resources, systems and data which reduce the risk and contributes towards the completion of the project in time.

HO: There is no significant association between designations and their expectations at effectively managing potential technology risks.

Crosstab

			Technological environment			Total
			Strongly disagree	disagree	agree	
Designation	Analyst programmer	Count	1	15	4	20
		% within Designation	5.0%	75.0%	20.0%	100.0%
	Assoc Consultant	Count	2	16	3	21
		% within Designation	9.5%	76.2%	14.3%	100.0%
	Manager	Count	3	11	1	15
		% within Designation	20.0%	73.3%	6.7%	100.0%
	Systems Engineer	Count	0	8	3	11
		% within Designation	0.0%	72.7%	27.3%	100.0%
Total		Count	6	50	11	67
		% within Designation	9.0%	74.6%	16.4%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.274[a]	6	.509
Likelihood Ratio	5.904	6	.434
N of Valid Cases	67		

a. 8 cells (66.7%) have expected count less than 5. The minimum expected count is .99.

From the above table chi square is not significant (sig. value is greater than 0.05), no evidence to reject null hypothesis. It means that there is no significant association between designation and their expectations at effectively managing potential technology risks.

Conclusion

The results indicated primarily that whether risks involved in IT organizations are of internal or external. The study mainly contributed to identification of risk factors from various areas of knowledge. According to the experienced IT employees, the sources of risk are different in IT sector and business activities

have expanded globally where the concept of sustainability risk management is gaining priority to avoid risk.

Though corporate world is practicing various risk management strategies to face uncertainty and threats, to face uncertainty and current risks in IT business, more sophisticated approach is needed.

Cost of project, project schedule, project team, technological environment, organization culture, nature of client, participative decision making system and compensation system are some of important factors that have been identified from the study that are believed to instill risk management at all levels irrespective of the designation. The processes of managing risk and uncertainty are important from the sustainable project management perspective (Wang et al. 2020; Zaleski and Michalski 2021). The results support the importance of sustainable risk management in present global scenario.

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