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# Software risk management: Practices and failures in Kerala

## Bhavana BV and Sujesh CP

**Abstract**
The world has changed in the era of technology. Software has become a part of human activities. The development of software companies all over the world become necessary for people. Since it has developed a lot, software risk has also been enhanced. Software companies use various risk management practices to identify and mitigate software risks to reduce the failure of software projects. Software companies had many challenges during the stage of design and software project development. Software companies face many types of risk which largely affect attaining the target. Software risk management practices are the best solution for improving the success rate of software projects. Majority of the software companies fail to manage their risk in an efficient manner. Unrealistic schedules and budget increases the failure rate of information technology projects. Failures of software companies create huge losses and are unable to survive from competition. The various risk contributory factors of software companies are largely related to the failure rate. Software risk management is essential for all software projects and to reduce the failures of information technology projects.

**Keywords:** Software risk, Risk Management Practices, failures.
**JEL Codes:** C12, C83, M15, O22, G32

## Introduction
Software companies are functioning efficiently to develop software projects to satisfy customer requirements. Many software projects are designed and developed to avoid project complexity. Large projects involve heavy investment and require complex processes. The software development process involves several stages and requires adequate financial resources. Financial risk factors are determined in each phase with different dimensions. Software companies are fast growing with new technologies. Financial risks in software projects are inevitable which create a major impact on the development and implementation of software projects. The failure rate of projects affects the reputation of software companies. Many of the software program tasks are failed earlier than implementation because of insufficient planning. Budget and schedule for information technology projects are unattainable which leads to customer dissatisfaction. In the event of project failures, software companies are focusing on software risk management practices to survive stiff competition. Software risk management is important for all software companies since software risks are inevitable. Dimensions of risk are involved in all types of projects whether large, medium or small. Risk management practices were adopted to mitigate the risk. Every software company has started to grab opportunities to meet their challenges. Software risk management techniques help to turn negative threats into opportunities to fulfil the user's requirements. Efficient software risk management reduces the failures of software projects. Software risk needs to be managed to avoid software failure and noncompletion of software projects. Software project risk management has become a more and more popular and essential part of software companies. Identification of the root cause of the problem helps to reduce the risk to a great extent. Software risk management plan prepared by software companies manages ongoing software risk in the development stage. Positive attitudes to risk management focus on the long-term success of software projects. There are many software risk management practices to solve the software risk. The present study focuses on software risk management practices and failures in Kerala.

## 1. Review of literature

Literature review concerned with descriptions and summaries of selected studies about the concepts of risk factors, failures and risk management practices of software companies. Every research primarily attempts to find out the gap in the area of research and tries to fill it and open new scope for further studies. The researcher, here makes a humble attempt to come across some literary works closely related to the application and impact of the variables under the study. In the first phase, available literature on the assessment of risk factors are reviewed to synchronise the emergence of the concept and to fix the research gap in this aspect. The second phase includes summaries of the research works on the identification of failures of software companies. The third phase presents the reviews on the relationship of risk management practices with risk factors and failures of software companies. The last phase illustrates software risk management based on the previous research on the thrust area.

Global software companies stand to lose billions every 12 months in information technology project overruns and remodelling software programs. In their experience, 40% of software development costs alone can be a tidy sum. Furthermore, on average only one in six software projects are delivered on time and to budget. Even when these projects are completed, many are not more than a mere shadow of their original application [16]. Research would support projects usually fail because of management mistakes rather than technical mistakes and it could be argued that managerial issues are more important than technical issues in software projects [5, 11]. Clearly, software mistakes are expensive and can lead to software companies going out of business. Prevention is always better than cure. Risk management might appear just to add complexity to an already complex undertaking. In reality, however, risk management practices make software projects less complex [3, 30]. Risk control doesn't always imply keeping off initiatives that would incur an excessive degree of risk. Prospering in today's software marketplace often means that high-risk projects are precisely the ones we need to undertake. Projects using software risk management have more predictable schedules and they experience fewer failures, since they had identified risks before they can become problems [1, 9, 14, 17]. Preparing a detailed risk assessment for software projects are costly and time consuming, however in the long run the benefits that accrue normally outweigh the cost involved. Software risk management experts agree that the costs associated with taking a few preventive measure early on are negligible when compared to the dramatic costs that can be incurred when proper risk management practices are neglected [7, 13]. Some projects occasionally require a less rigorous assessment. Depending on the scope and size of the project, organisations may fixed it appropriate to remain with the initial risk assessment. In the context of the risk management, ensure that there are on ongoing process for identifying, evaluating and managing the risks faced by the software companies [4, 37]. Given the complexity of software projects identifying key measures of success. Software projects are especially susceptible to risk due to the speed of development in the field and its rapidly changing environment. It was prudent to involve and derive measures from stakeholders as assumptions are often misleading. Software risk factors are unstable and changeable. Although cost and schedule may be fixed, actual costs in labour and time to complete are difficult to project [19, 25, 38]. Research suggests that senior managers within the organisation need to strike the right balance between keeping an overview and avoiding involvement in day to day management. Unfortunately there are not one single approach in projects. The need for a formal approach to software risk management helps the project manager set contingency budgets and review the adequacy of these budgets the project delivery get progressed [21, 35, 36]. Risk management practice concentrates on performing bottom up, detailed, continuous assessment of risk concerning itself with addressing the day to day operational risks that a project faces. Together they provide a 360 degree, three dimensional view of the risk that might confront a project [10, 12]. The management of risk and risk management approaches follow a repeatable and iterative process of assessment. Either take a holistic or system view of the risks likely to be encountered from their own unique perspectives and likewise take a system view of how they should be mitigated. Both should be done continually over the life of a project from its initiations to its completion. Although there are different schools of thought, my view was that the software project risk approach should address the software project risk in top down, granular, periodic and concern high level decisions, such as whether a project should be initiated, should it receive funding, had it passed a major milestone [8]. Project risk management are to be viewed in two perspectives, short term and long term views. Short term usually address the current project plan and immediate future. Long term perspective address issues that are beyond the short term. Like many other aspects of risk management, the distinction between these two perspectives can sometimes be unclear to the project managers [18, 26, 33]. Developments in risk management practices had allowed some software companies to implement and strengthen their management of risk. Modelling techniques and thinking methods such as brain storming had gained favour within project management. These thinking techniques are used to understand risk and includes quantitative, semi quantitative and qualitative techniques. These methods are frequently applied in the work place [22, 31]. Every proposed IT project for an organisation had identifiable benefits usually require domain knowledge and understanding of the work processes of the software companies and its customers. Possible benefits to customers may include improvements to the current IT services, reduction of risk and addition of new services to enhance their value in the market [2, 24]. Most of the dramatic failures and issues in software projects are the result of improper use of risk analysis techniques. Uncertainties in software projects enhanced and created complexity in initial stages of software development. All projects are unique and the complexities are concerned about the associated risks and how they can be effectively managed. Many projects fail because the software companies assume that all the projects would succeed and they therefore do not identify, analyse and provide mitigation strategies for the risk elements involved in the project [6, 20, 27]. Software initiatives are challenging efforts that are particularly prone to failure. There is still no universally agreed-upon definition of what constitutes an IT project failure, despite the fact that high rates of IT project failure are widely acknowledged to be the most urgent issue facing the IT profession. Project size and complexity,

inadequate leadership, lack of IT department support, altered user needs and other factors are among the main causes of project failure [28, 32]. Software companies of low capability experience the highest incidence of failure. Developing the organisation's capability to manage risk and benefits customers and providers. The long term success of any risk management practice are contingent upon the people in the software companies to develop positive attitude to risk management [15, 23, 30]. The likelihood of an event happening and the severity of its effects will both decrease with effective risk management. IT initiatives are crucial for the organisation because of their importance and risk to the organisation. A project's chances of success are increased by effective risk management. The early detection of hazards, systematic analysis, and strategic control of the detected risks are some of the hurdles that must be overcome for project risk management to be successful [29, 34]. There are many risk elements in software projects and managing these risks becomes great challenge for project managers. Even though there are success factors still the software companies had risk factors in every stage of project development. Completion of project in successful manner requires effective planning in viewing the failures. As the size of the project increases the risk it had also increases. So, the software companies are trying different practices to resolve the problem. In this context the present research in this field becomes an essential for the software companies for completion of the project more effectively. A detailed review of software risk management conducted in various institutions of different countries are provided by the researcher. Through these reviews it is very clear that the proposed study tries to give an idea to reduce software risk and thereby initiates the organisation to follow effective software risk management practices for the smooth running of information technology projects and success of software companies.

## 2. Research Gap

The review of available literature on software risk factors, failures and risk management practices explains the importance of these variable in managing software risk. As per the findings of previous researches, software risk management involves a subjective assessment of risk contributory factors and success factors. There are gaps regarding risk factors variations with the influence of risk management techniques and it also had various approaches regarding the view of software risk management in different perspectives. There are studies relating to software risk management practices but it fails to provide effective risk management practices to be followed by the software companies. Among these gaps the researcher finds that only least number of studies are about software risk management practices. After going through the available literature, it is difficult to find studies relating to the concept of software risk management practices and failures together. Therefore, the researcher put forward this research to assess the software risk management practices by viewing the failures in a new dimension. So, it is desirable to have a study on the concerned matter, as it is one of the major developing sector in Kerala to boom in the world.

## 3. Significance of the Study

The new era of technology makes everything easier and faster. Software companies are the source which provides the facilities to work efficiently with limited time. Different software was available to meet different user's needs. As the numbers of software projects are involved software risk also get increased. Lengthy and highly complex project had larger risk to be identified. The project manager had to identify these risks in order to manage and control them effectively. Identification of risk before it takes place helps for proactive actions to reduce the software risk. Software risk management does not mean eliminating projects with high levels of risk. Generally software risk management helps to develop software project by detecting factors that prevents failures and leads to success of the software companies. Software risks are a serious issue for every software company while developing the project. Lack of commitment from top management will adversely affect the software companies. Risk assessment and monitoring should be done to detect errors. Software risk ultimately results in the non-completion of projects within the preplanned schedule. Software companies are trying hard to manage the risk in order to run the project smoothly. There are many factors which affects the implementation of information technology projects. Project managers are vigilant and confident to face all the problems while developing a software project. Software project should be developed according to the customer's requirements. Risk dimensions of software companies are identified to assess the failures in software projects. Many large software development companies get failed in initial stage of the project development. Mainly failures in software risk management undertake different process according to the significance, size and kinds of projects.

Software project should get focused on critical factors. Software risk management practices helps to reduce the risk. Software companies had different risk management practice that may involve low impact and small sized project may not involve complexity in risk management than the highly complex projects. The risk management requires software project to be developed with adequate time without any delay in delivery of the project. Because it may affects the fulfillment of customer requirement in appropriate time. Evaluation and reaction to the software risks becomes easier for the project manager to implement the software projects. Software risk management finds the causes of failures and provides appropriate techniques for the successful implementation of software projects.

Hence, the present study attempts to provide better insights into the risk management practices to the employees, investors and regulatory system of the software industry. The soundness of risk management practices is a major determinant of the value of shares. As the technological advancements are taking placing with a high velocity, chances of risk are more. The better the risk management practices, the better the confidence of investors. It is hoped that the study would help the software companies to identify the gaps in the risk management procedures and practices undertaken by them. The results of the study would provide a better insight into the factors which contribute to the risk of the software companies and the role of risk management in improving the profitability of the software companies. The study attempts to identify the factors leading to risks of varied nature and hence the outcome of the study would be useful to the software management in the formulation of policies for incorporating changes in the current practices in

order to cope up with the newer challenges faced by the software industry.

## 4. Scope of the Study

The scope of the present research is restricted to an investigation of the software risk management practices and failures of software companies in Kerala. The research attempts to study the specific areas of identification of risk contributing factors, and the influence of the effects of risks on the performance of information technology projects of software companies. The work attempts to analyse the relationship between these risk factors and the effects of risks. It also tries to study the key reasons for the failures of software companies and various risk management practices followed by the software companies comes under the ambit of the present work.

## 5. Research Questions

The present research work attempts to investigate into the following major research questions.

- What are the key factors which contribute to various types of risks in the software companies in Kerala?
- What are the main reasons for the failure of software companies in Kerala?
- What are the risk management practices followed by the software companies in Kerala?

## 6. Objectives of the Study

The main objective of the present investigation is to conduct an in-depth analysis of the software risk management practices of software companies in Kerala. To achieve the main objective, the following specific objectives have been set forth.

- To study the risk contributory factors and to analyse the effect of these risks on the success of software companies in Kerala.
- To examine the reasons for the failures of software companies in Kerala.
- To analyse the software risk management practices followed by software companies in Kerala.

## 7. Hypotheses of the study

The following hypotheses are used to study the software risk management practices and failures in Kerala.

**$Ho_1$:** There is no significant relationship between risk contributory factors, success factors and risk management practices of software companies.

**$Ho_2$:** Failures of software companies do not influence the software risk management practices followed by software companies.

**$Ho_3$:** There is no significant difference in software risk management practices based on the nature of software companies.

**$Ho_4$:** There is no significant difference between the nature of software companies and the failure reasons of software companies.

## 8. Research Methodology

The study is analytical which is mainly based on primary data. The data are collected from project managers of software companies with the help of a structured questionnaire. The technique of multi-stage random sampling was adopted for the selection of 300 project managers in 60 software companies. The period of study ranges from 12/02/2020 to 22/12/2020. For analyzing the data different mathematical and statistical tools like Correlation, Regression, Independent sample t-tests, ANOVA and Factor analysis were used.

## 9. Pilot study and Pre test

A pilot study was conducted among the selected 100 project managers of different software companies. Pre-test was successfully used to explore and verify the tools, and after that, the questionnaires were finalised with the help of appropriate revisions.

## 10. Reliability Tests

To determine if the scaled statements in the surveys were internally consistent, a reliability test utilising Cronbach's Alpha was used. When a scale is reliable, it produces the same result every time measurements are taken. Each of the variables in the schedule has Cronbach's Alpha values greater than 0.70, demonstrating the high level of internal consistency of the scale and demonstrating the excellent reliability of the questionnaire.

The specifics are displayed in Table.

**Table 1:** Reliability Statistics

| Scale | Variables | Cronbach Alpha | Number of items |
|---|---|---|---|
| Risk Factors | User | 0.869 | 9 |
| | Requirements | 0.855 | 4 |
| | Project Complexity | 0.852 | 4 |
| | Planning and Control | 0.830 | 7 |
| | Team | 0.843 | 4 |
| | Organisation Environment | 0.840 | 3 |
| | Communication | 0.820 | 3 |
| | Security | 0.791 | 3 |
| | Design | 0.766 | 4 |
| | Vendor | 0.811 | 5 |
| | Technology | 0.911 | 6 |
| | Procurement | 0.759 | 4 |
| Failures | Lack of Resources | 0.865 | 5 |
| | Inadequate Knowledge and skills | 0.820 | 5 |
| | Failure to redesign software | 0.818 | 3 |
| | Mismanagement of funds | 0.751 | 3 |
| Risk Management Practices | Checklist | 0.890 | 7 |
| | Cause and Effect Diagram | 0.893 | 6 |
| | Fault Tree Analysis | 0.892 | 5 |
| | Probability and Impact Grid | 0.852 | 3 |
| Success factors | Profitability and Growth | 0.751 | 5 |
| | Evaluation of Technical Skills | 0.822 | 4 |
| | Cost Effectiveness | 0.909 | 4 |
| | Accountability | 0.795 | 5 |
| | Attainment of project objectives | 0.812 | 5 |

***Source*:** Primary Data

## 11. Validity

Project managers and software engineers were consulted to improve the survey tools to assure validity. A panel of experts assessed the study's questionnaire, and changes and suggestions were made as a result (Content Validity). The expert panel also examined whether the measurement seemed to be made by the instrument in question (Face Validity). The researcher attempted to verify face validity in the current study by checking to see if the instrument contained the key measurement items.

### 12. Normality Tests
Skewness and kurtosis were assessed to determine the data's normality. The permissible skewness and kurtosis values fall between the specified ranges, namely 3 and 10. (Brown, 2010). As a result, normality is considered appropriate and could be applied to the study using a parametric test.

### 13. Test of Randomness
Run tests are used to determine whether the collection of observations represents a representative sample of the population. The run test result makes it evident that the p values are typically over 0.05. Therefore, it is presumed that the data's randomness is true.

### 14. Test of Data Independence
Data independence is only guaranteed if the Durbin-Watson value is between 1.5 and 2.5. The Durbin-Watson value in the current study is within the established limitations.
Data independence is therefore present.

### 15. Limitations of the study
- The response rate of the questionnaire was moderate since the IT companies were reluctant to provide information needed for the study.
- The present study may not be fully free from response errors.

## Results and Discussions
The analysis result of software risk management practices and failures in Kerala.

### 1. Exploratory Factor Analysis
Exploratory factor analysis is used to condense given data into a more manageable set of summary variables. It determines how respondents in a dataset and a variable are related structurally by classifying the variables based on their significant relationships, producing a factor structure. KMO scores typically range from zero to one, with zero denoting a large partial correlation relative to the sum of correlation that precludes factorization. If the number is near to one, it means that the correlation pattern is reasonably tight and factorization can be used to isolate unique and trustworthy elements.

**Table 2:** KMO and Bartlett's Test

| Measure | Value |
|---|---|
| Kaiser-Meyer-Olkin Measure of Sample Adequacy | 0.929 |
| Approx. Chi-Square | 3965.14 |
| **Bartlett's Test of Sphericity** | |
| Degrees of Freedom (df) | 120 |
| Significance (Sig.) | 0.000 |

***Source*:** Primary Data

With 120 degrees of freedom and a Chi Square value of 3965.145, the Bartlett Test of Sphericity (BTS) was significant (p 0.001) and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was determined to be outstanding (0.929) (Kaiser, 1974).It appears that the population correlation matrix is not an identity because the associated significance level is minimal and the value of the test statistic for sphericity is large. It obviously offers assistance and freedom for factorization and conducting subsequent analysis.

### 2. Factor Name, Variance and Reliability
The table below, which represents the results of factor analysis, illustrates the explained variance and reliability of rotational factors. Given that the Cronbach's alpha for each of the five recovered variables is greater than 0.70, it is obvious that all retrieved factors have sufficient reliability.

**Table 3:** Factor Name, Variance and Reliability

| Factor | Variance | Cronbach's Alpha | Factor Name |
|---|---|---|---|
| 1 | 23.038 | 0.968 | Technology |
| 2 | 18.582 | 0.883 | Planning and Control |
| 3 | 16.161 | 0.862 | Design |
| 4 | 15.653 | 0.851 | Vendor |
| 5 | 24.401 | 0.987 | Organisation Environment |

***Source*:** Primary Data

### 4. Relationship between risk contributory factors and success of software companies
$Ho_1$: There is no significant relationship between risk contributory factors and success factors of software companies.

**Table 4:** Correlation between Risk Contributory Factors and its variables

| Sub-variables | Risk Contributory Factors | r | p-value |
|---|---|---|---|
| User | | 0.709** | .000 |
| Requirements | | 0.735** | .000 |
| Project Complexity | | 0.659** | .000 |
| Planning and Control | | 0.675** | .000 |
| Team | | 0.868** | .000 |
| Organisation Environment | | 0.843** | .000 |
| Communication | | 0.775** | .000 |
| Security | | 0.568** | .000 |
| Design | | 0.683** | .000 |
| Vendor | | 0.709** | .000 |
| Technology | | 0.685** | .000 |
| Procurement | | 0.673** | .000 |

***Source*:** Primary Data

From the table, it can be seen that all the variables are positively correlated to the risk contributory factors and the relationships are considered as significant since their pvalues are lower than the significance value of 0.05. On the basis of the correlation analysis, the variables that have highest correlation coefficient value with the risk contributory factors can be considered as the most important variable related to the risk contributory factors.
The table points out that all the variables are positively correlated to the employee satisfaction and all the relationships are assumed as significant since the p-values are lower than the significance value of 0.05. All the variables in the table has highest correlation coefficient value to the success factors so it can be regarded as the most significant variables in connection to the success factors based on the correlation analysis.

**Table 5:** Correlation between Success Factors and its variables

| Sub-variables | Success Factors | r | p-value |
|---|---|---|---|
| Profitability and Growth | | 0.371** | .000 |
| Evaluation of Technical Skills | | 0.571** | .000 |
| Cost Effectiveness | | 0.674** | .000 |
| Accountability | | 0.726** | .000 |
| Attainment of Project Objectives | | 0.707** | .000 |

***Source*:** Primary Data

**Table 6:** Correlation (Bivariate correlation)

| Variable | Risk Management Practices | Success Factors | Risk Factors |
|---|---|---|---|
| Risk Management Practices | Pearson correlation | 1 | 0.409** |
| | Sig (2-tailed) | .000 | .000 |
| | N | 300 | 300 |
| Success Factors | Pearson correlation | 0.409** | 1 |
| | Sig (2-tailed) | .000 | .000 |
| | N | 300 | 300 |
| Risk Factors | Pearson correlation | 0.184* | 0.441** |
| | Sig (2-tailed) | .000 | .000 |
| | N | 300 | 300 |

***Source*:** Primary Data

$Ho_1$: There is no significant relationship between risk contributory factors, success factors and risk management practices of software companies.

The correlation table (Bivariate correlation) shows that risk management practices as the dependent variable which influences risk contributory factors and success factors of software companies (independent variables) at 1% and 5% levels of significance. Risk management practices had 0.409 which means a moderate correlation with success factors and 0.184, a low correlation with risk factors and it also depicts that a positive relationship exists between the variables. So, it can be concluded that there is a relationship between risk management practices, risk contributory factors and success factors of software companies.

## 5. Regression analysis of failures of software companies and software risk management practices of software companies

$Ho_2$: Failures of software companies do not influence the software risk management practices followed by software companies.

**Table 7:** Multiple Regression

| Model | B | T | Sig | F-Value | $R^2$ |
|---|---|---|---|---|---|
| (Constant) | 1.268 | 4.228 | .000 | 61.765 | (0.000)** |
| Failures of software | 0.663 | 7.859 | .000 | 47.6% | companies |

***Source*:** Primary Data

The regression table reveals the influence of failures of software companies on software risk management practices. The value representing the influence of failures on software risk management practices is 0.663 Table VII is showing that any changes that is happening in the independent variable "software risk management practices" is 47% occurs because of key reasons of failures of software companies.

**Table 7:** Software risk management practices based on nature of software companies

| Nature / SRMP | Small | Medium | Large | Aggregate | ANOVA (P value) |
|---|---|---|---|---|---|

In order to understand whether there is any difference in the software risk management practices based on nature of software companies i.e. small, medium and large, one way ANOVA test is performed.

$Ho_3$**:** There is no significant difference in software risk management practices based on nature of software companies.

**Table 8:** One Way ANOVA

| Checklist | 4.71 | 4.72 | 4.38 | 4.70 | 0.43 |
|---|---|---|---|---|---|
| (Standard Deviation) | (0.69) | (0.62) | (0.82) | (0.66) | |
| Cause and Effect Diagram | 2.52 | 2.66 | 3.08 | 2.65 | 0.358 |
| (Standard Deviation) | (1.79) | (1.74) | (1.79) | (1.76) | |
| Fault Tree Analysis | 4.76 | 4.81 | 4.42 | 4.58 | 0.709 |
| (Standard Deviation) | (0.77) | (0.62) | (0.88) | (0.83) | |
| Probability and Impact Grid | 4.62 | 4.58 | 4.42 | 4.58 | 0.548 |
| (Standard Deviation) | (0.83) | (0.83) | (0.88) | (0.83) | |
| Aggregate | 4.15 | 4.19 | 4.16 | 4.18 | 0.998 |
| (Standard Deviation) | (1.09) | (1.03) | (0.74) | (1.03) | |

***Source***: Primary Data

Figures in brackets are the standard deviation.

Significant at 5%level

ANOVA table shows that P value of software risk management practices of software companies based on nature of software companies. Since the p value is greater than 0.05 at 5% level of significance, the null hypothesis is accepted. So, there is no significant difference in the software risk management practices based on nature of software companies.

**6. Nature-wise analysis of failure reasons of software companies:** Software companies are classified as small, medium and large. There are four main reasons for the failure of software companies. The following analysis is made to conduct to know whether there is any difference between the nature of software companies and key reasons for failures.

**Table 9:** Independent sample t-test

| Failure Reasons | Small | Medium | Large | T Value | P Value |
|---|---|---|---|---|---|
| Lack of resources | 3.08 (1.07) | 3.56 (1.14) | 3.21 (1.18) | 3.22 (1.06) | 0.005 |
| Inadequate knowledge & skills | 3.07 (0.93) | 3.63 (1.13) | 3.25 (1.12) | 3.16 (1.08) | 0.789 |
| Failure to redesign software | 3.38 (1.03) | 3.39 (1.12) | 3.50 (1.13) | 3.22 (1.06) | 0.397 |
| Mismanagement of funds | 3.22 (1.06) | 3.16 (1.08) | 3.50 (1.13) | 3.22 (1.06) | 0.612 |

***Source*:** Primary Data

$Ho_4$: There is no significant difference between the nature of software companies and the failure reasons of software companies.

**Figures in brackets are the standard deviation**

Table IX reveals that as the P value is greater than 0.05, the null hypothesis is accepted. This states that there is no significant difference between small, medium and large software companies with respect to failure reasons such as lack of resources, inadequate knowledge and skills, failure to redesign software and mismanagement of funds.

## Conclusion

Software Risk management is getting a lot of attention since it is seen to be a way to make new software project development processes more efficient in terms of cost,

schedule, and technical performance. The effective integration of particular software risk management practices recommended by various software companies and their associations with risk contributory factors, success factors and key reasons for the failures of software companies are the subject of the present research. Software companies face high risks in the completion of information technology projects. The presence of software risk management practices and the influence of the risk manager paves to success of the project. It was evident from the exploratory factor analysis that there are five major risk contributory variables, including technology, planning and control, design, vendor, and organisational environment. It was shown that there is a strong correlation between the success criteria for software companies and riskcontributing elements. Based on software company failure causes, 47% of improvements to software risk management practices are made. It was clear that software risk management practices and the nature of software companies were not significantly different from one another. In a competitive environment, software failures present a significant issue. The reasons for software company failure are consistent regardless of the form of the company.

**Future Scope of the Research**

The researcher after reviewing the related studies proposes the following areas for further research:

- A Comparative Study on Software Risk Management Practices of Small, Medium and Large Software companies.
- Financial risk of Software Companies – An Evaluative Study.
- Software Risk Management Practices: A Project Manager Survey.

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