Chapter 3

Research Methodology
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In this chapter, the detailed methodology of the study titled “A Study of Quality Assurance Practices in Software Industry in India” is presented.

3.1 Objectives of the study:

1. To assess and identify the practices followed by different software development organizations in India
2. To identify the factors influencing activities such as configuration management, project monitoring and control, Risk Management, Requirements Management and Quantitative Project Management in any software project in the software development organizations in India
3. To assess the difference in the opinion of the project managers performing and not performing the various identified activities relating to quality assurance
4. To explore the relationship between various activities relating to quality assurance practices in the software organization.
5. To offer suggestions in improving performance of the company by strictly adopting the quality assurance practices.

In answering the objectives of the study, the following research methodology is adopted.

3.2 Population

The population of the study comprises of the software service companies in India. As per the Nasscom research reports (2011-2012), there were 957 software service companies in India. The domain of business of these companies includes software development, business application support, maintenance and bug fix of existing applications etc based on the customer requirements. The services of these companies are being utilized by domestic and international customers. Hence the population of the study covers the software service companies in India.
3.3 Sample Size

Even though there are several formula available to determine the sample size for research studies, a general practice among the researchers of social science and management is to have a sample size of 5%-10% of the population. By considering the area of the population and the difficulty involved in collecting the data from the respondents of the various companies, it was decided to have 10% of the population namely 96 software companies as the sample size for the study.

3.4 Sampling Technique

There are two types of sampling techniques practiced—probability sampling and non-probability sampling. Among the probability sampling techniques, stratified sampling technique is used for the study, as the distribution of software companies across various geographical locations—namely south India, North India, West India and East India are 415,272, 42 and 228 respectively. (Nasscom report 2011-2012).10% of each of the locations was selected for the study, through simple random sampling. Hence the sample for the study comprises of 42 companies from South India, 27 from North India, 5 from East India and 22 from West India. As the sampling is done in two stages, the sampling technique adopted in the study is stratified sampling.

3.5 Data Collection

In collecting the information from the respondents (Project Manager/Developer/Tester/Quality Assurance Person) from the selected companies, a questionnaire was constructed in consultation with the experts in quality assurance (six sigma black belts, six sigma green belts, ISO auditors, CMMI practitioners etc). The questionnaire comprising of personal and organizational factors and study related factors covering the important quality assurance practices related to requirements management, configuration management, risk management, project monitoring and control and quantitative project management. As there is a great difficulty in getting the response from the target respondents due to the security aspect, the information was collected from the target respondents through emails/common friends/consultants. In order to improve the quality of
the questionnaire, a pilot study was conducted based on a sample of ten respondents and the questionnaire was modified based on the outcome of the pilot study.

3.6 Tools used for the Study

The following tools were used in tune with the objectives of the study.

- Percentage analysis
- Chi-square analysis
- Correlation analysis
- Root cause analysis and fish bone diagram
- Nominal group technique

All the statistical tests were conducted at 5% level of significance.

3.7 Hypotheses in the Study

- The personal and organizational factors of the respondents have no significant influence on the availability of project level goals/performance indicator for different projects in quantitative project management.

- The personal and organizational factors of the respondents have no significant influence in Implementation of any tool for data driven project management in quantitative project management.

- The personal and organizational factors of the respondents have no significant influence in availability of guidelines for selecting sub processes contributing to project goals in quantitative project management.

- The personal and organizational factors of the respondents have no significant influence in the availability of feedback system for projects in project monitoring and control.

- The personal and organizational factors of the respondents have no significant influence in implementation of tool for project monitoring and control.
• The personal and organizational factors of the respondents have no significant influence in the availability of organization level guidance for risk management.

• The personal and organizational factors of the respondents have no significant influence in availability of risk repository referred by projects for risk planning in risk management domain.

• The personal and organizational factors of the respondents have no significant influence in availability of practices that will promote project to report all project level risks in risk management.

• The personal and organizational factors of the respondents have no significant influence in implementation of tools for project risk management.

• The personal factors of the respondents have no significant influence in adequacy of project plan in addressing techniques/process used for collection of requirements in requirements management.

• The personal and organizational factors of the respondents have no significant influence in availability of formal system for obtaining commitment from the stakeholders for the requirement changes in requirements management.

• The personal and organizational factors of the respondents have no significant influence in implementation of any tool for requirements management.

• The personal and organizational factors of the respondents have no significant influence in types of artifacts in configuration management.

3.8 Difficulties faced in data collection

In conducting the study of this type which is nationwide, the researcher faced lot of difficulties not only in the construction of the questionnaire (few experts were available in quality assurance), but also in the collection of the data because of the confidentiality and security reasons. So the researcher, being a quality assurance practitioner has to utilize his experience and personal relationships to overcome the hurdles faced in data collection.