CHAPTER THREE
RESEARCH METHODOLOGY

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3.1 INTRODUCTION

The previous chapter provides the detail about the view of experts and authors about contribution and impact of KM practices in general. The purpose of this study is to gain an insight into the KM practice tools being followed in the Indian IT sector. To accomplish this, it is necessary that a rigorous methodology should be adopted. The methodology adopted in this research is described in this chapter.

3.2 STATEMENT OF THE PROBLEM

Statement of the problem of any research gives the purpose of the study. The statement of the problem of this research is described as follows.

A knowledge friendly culture of an organization determines the success of a company. Knowledge management tools and techniques need to be well deployed in the organizations. The research addresses issues related to adoption of these tools in Indian IT sector.

The present research has been designed to gain an insight into the KM practices being followed in Indian IT sector. The focus is to understand the select issues of KM practices tools. In short the research aim to carry out an empirical study on knowledge management practices in Indian IT sector with respect to knowledge creation, knowledge sharing, knowledge acquisition, knowledge mapping, knowledge coding and knowledge storing.

3.3 RESEARCH OBJECTIVES

The research objectives of this study are:

- To assess current state-of-art for KM practice tools being followed in the Indian IT industry.
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➢ To explore competitive priorities, major enablers, critical knowledge require for success of organizations and major obstacles for introducing new ideas and technology used in KM practice by IT industry.

➢ To find out the perception on checking tools used for knowledge storing, knowledge acquisition and knowledge mapping process.

➢ To assess knowledge intensity and depending factors on knowledge sharing process.

➢ To analyzing major tools used for knowledge creation, knowledge codification, knowledge mapping, knowledge acquisition and knowledge sharing process.

➢ To ascertain KM practices and perceptions of Indian IT sector.

➢ To develop an ISM framework to find the inter-relationship among KM variables for Indian IT sector.

In nutshell this research aim is to gain an insight into the KM practices being followed in Indian IT sector. The focus is to understand the select issues of practices of KM tools. This can provide an important input to the practicenors for deciding the right path in their KM journey.

3.4 SCOPE OF PRESENT WORK

This research is focused on knowledge management practices tools in Indian IT Sector. Scope of present work is as follows.

1. The research is focused to carry out an empirical study on select issue in knowledge management practices in Indian IT firms with respect to: knowledge
codification, knowledge storing, knowledge mapping, knowledge sharing, knowledge acquisition and knowledge creation.

2. The select issues in KM practices are being examined in the context of Indian IT sector to ascertain KM practices and perceptions.

3. The study also develop direct relationship model for different variable of KM practice tools.

4. The driving power and dependence of some of the important knowledge management variables are explored in this research.

5. The relevance of the research is both from industry and academic viewpoint. The research aims to consider issues related to encapsulation, sharing, dissemination and application of knowledge asset in Indian IT sectors.

3.5 HYPOTHESES OF THE STUDY

The process of establishing hypotheses is the basis for tracking the possible reasons of existing problem. Accordingly, hypotheses were formulated on the seventeen major aspects of the KM practice tools. In total forty eight hypotheses formulated to be tested with the help of questionnaire.

HYPOTHESIS BASED ON THE CRITICAL FACTORS TO THE SUCCESS FOR ORGANISATIONS

HYPOTHESES BASED ON THE ASPECTS OF OBSTACLES FOR INTRODUCING NEW IDEAS AND TECHNOLOGIES

H01 There is no significant difference among various IT sectors for identifying business needs as obstacles for introducing new ideas and technologies.
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H$_{02}$ There is no significant difference among various IT sectors for understanding new technologies as obstacles for introducing new ideas and technologies.

H$_{03}$ There is no significant difference among various IT sectors for existing IT infrastructure as obstacles for introducing new ideas and technologies.

H$_{04}$ There is no significant difference among various IT sectors for difficulty in cost justifying new technology as obstacles for introducing new ideas and technologies.

H$_{05}$ There is no significant difference among various IT sectors for budgetary constraints as obstacles for introducing new ideas and technologies.

H$_{06}$ There is no significant difference among various IT sectors for organization culture as obstacles for introducing new ideas and technologies.

**HYPOTHESIS BASED ON THE ASPECTS OF COMPETITIVE PRIORITIES OF ORGANISATIONS**

H$_{07}$ There is no significant difference among various IT sectors for innovation used as competitive priority of organization.

H$_{08}$ There is no significant difference among various IT sectors for cost reduction used as competitive priority of organization.

H$_{09}$ There is no significant difference among various IT sectors for improvement used as competitive priority of organization.
H_{0}^{10} \text{ There is no significant difference among various IT sectors for quality used as competitive priority of organization.}

H_{0}^{11} \text{ There is no significant difference among various IT sectors for improved delivery used as competitive priority of organization.}

H_{0}^{12} \text{ There is no significant difference among various IT sectors for flexibility in solving problems used as competitive priority of organization.}

**HYPOTHESIS BASED ON THE ASPECTS OF TYPE OF KNOWLEDGE THAT IS CRITICAL TO SUCCESS FOR ORGANISATIONS**

H_{0}^{13} \text{ There is no significant difference among various IT sectors for using customer feedback as the type of knowledge that is critical to the success for the organizations.}

H_{0}^{14} \text{ There is no significant difference among various IT sectors for using competencies as the type of knowledge that is critical to the success for the organizations.}

**HYPOTHESIS BASED ON THE KNOWLEDGE CREATION**

**HYPOTHESIS BASED ON THE TOOLS USED FOR KNOWLEDGE CREATION**

H_{0}^{15} \text{ There is no significant difference among various IT sectors for using knowledge directories as a tool for knowledge creation.}

H_{0}^{16} \text{ There is no significant difference among various IT sectors for using collaborative platform as a tool for knowledge creation.}

H_{0}^{17} \text{ There is no significant difference among various IT sectors for using customer opinion as a tool for knowledge creation.}
$H_{0.18}$ There is no significant difference among various IT sectors for using innovation as a tool for knowledge creation.

**HYPOTHESIS BASED ON THE ASPECTS OF TECHNOLOGICAL ENABLERS USED FOR KNOWLEDGE CREATION**

$H_{0.19}$ There is no significant difference among various IT sectors for using corporate intranet as a tool for knowledge creation.

$H_{0.20}$ There is no significant difference among various IT sectors for using internet as a tool for knowledge creation.

**HYPOTHESIS BASED ON THE KNOWLEDGE CODIFICATION**

**HYPOTHESIS BASED ON THE TOOLS USED FOR REQUIREMENT OF KNOWLEDGE CODIFICATION PROCESS**

$H_{0.21}$ There is no significant difference among various IT sectors for using cataloguing knowledge required for knowledge codification process.

$H_{0.22}$ There is no significant difference among various IT sectors for using digitization required for knowledge codification process.

$H_{0.23}$ There is no significant difference among various IT sectors for using electronic memory required for knowledge codification process.
HYPOTHESIS BASED ON THE ASPECTS OF IT TOOLS USED FOR KNOWLEDGE CODIFICATION PROCESS

H_0_{24} There is no significant difference among various IT sectors for using programming languages as IT tools for knowledge codification process.

H_0_{25} There is no significant difference among various IT sectors for using artificial intelligence as IT tools for knowledge codification process.

HYPOTHESIS BASED ON THE KNOWLEDGE STORING

HYPOTHESIS BASED ON THE ASPECTS OF TOOLS USED FOR KNOWLEDGE STORING PROCESS

H_0_{26} There is no significant difference among various IT sectors for using knowledge maps as tool used for knowledge storing process.

H_0_{27} There is no significant difference among various IT sectors for using professional developers as tool used for knowledge storing process.

HYPOTHESIS BASED ON THE ASPECTS OF TOOLS USED FOR CHECKING KNOWLEDGE STORING PROCESS

H_0_{28} There is no significant difference among various IT sectors for using operational focus as checking tool used for knowledge storing process.

H_0_{29} There is no significant difference among various IT sectors for using customer and market focus as checking tool used for knowledge storing process.
HYPOTHESIS BASED ON THE KNOWLEDGE ACQUISITION

HYPOTHESIS BASED ON THE ASPECTS OF TOOLS USED FOR KNOWLEDGE ACQUISITION PROCESS

H₀ ₃₀ There is no significant difference among various IT sectors for hiring talent and experts as tool used for knowledge acquisition process.

H₀ ₃₁ There is no significant difference among various IT sectors for using patents for knowledge acquisition process.

HYPOTHESIS BASED ON THE ASPECTS OF OBSTACLES FOR KNOWLEDGE ACQUISITION PROCESS

H₀ ₃₂ There is no significant difference among various IT sectors for existing IT infrastructure as obstacles for knowledge acquisition process.

H₀ ₃₃ There is no significant difference among various IT sectors for budgetary constraints as obstacles for knowledge acquisition process.

HYPOTHESIS BASED ON THE KNOWLEDGE MAPPING

HYPOTHESIS BASED ON THE ASPECTS OF TOOLS USED FOR KNOWLEDGE MAPPING PROCESS

H₀ ₃₄ There is no significant difference among various IT sectors for using surveys as tool used for knowledge mapping.

H₀ ₃₅ There is no significant difference among various IT sectors for using knowledge yellow pages as tool used for knowledge mapping.
HYPOTHESIS BASED ON THE ASPECTS OF TOOLS USED FOR CHECKING KNOWLEDGE MAPPING PROCESS

\( H_0 \) 36 There is no significant difference among various IT sectors for using balanced scorecard as checking tool used for knowledge mapping.

\( H_0 \) 37 There is no significant difference among various IT sectors for using project tracking as checking tool used for knowledge mapping.

HYPOTHESIS BASED ON THE KNOWLEDGE SHARING

HYPOTHESIS BASED ON THE ASPECTS OF TOOLS USED FOR KNOWLEDGE SHARING PROCESS

\( H_0 \) 38 There is no significant difference among various IT sectors for using groupware as tool used for knowledge sharing.

\( H_0 \) 39 There is no significant difference among various IT sectors for using intranet portal tool used for knowledge sharing.

\( H_0 \) 40 There is no significant difference among various IT sectors for using video conferencing as tool used for knowledge sharing.

\( H_0 \) 41 There is no significant difference among various IT sectors for using corporate yellow pages as tool used for knowledge sharing.

\( H_0 \) 42 There is no significant difference among various IT sectors for using white papers as tool used for knowledge sharing.
HYPOTHESIS BASED ON THE ASPECTS OF OBSTACLES FOR KNOWLEDGE SHARING PROCESS

$H_0_{43}$ There is no significant difference among various IT sectors for individual factor – lack of time as an obstacles for knowledge sharing process.

$H_0_{44}$ There is no significant difference among various IT sectors for Culture factor – lack of support from top management as an obstacles for knowledge sharing process.

HYPOTHESIS BASED ON THE ASPECTS OF INTENSITY FOR KNOWLEDGE SHARING PROCESS

$H_0_{45}$ There is no significant difference among various IT sectors for knowledge access as an intensity for knowledge sharing process.

$H_0_{46}$ There is no significant difference among various IT sectors for knowledge representation as an intensity for knowledge sharing process.

HYPOTHESIS BASED ON THE ASPECTS OF FACTORS DEPENDENT FOR EFFECTIVE KNOWLEDGE SHARING PROCESS

$H_0_{47}$ There is no significant difference among various IT sectors for teams as the factor in which effective knowledge sharing process depend.

$H_0_{48}$ There is no significant difference among various IT sectors for network as the factor in which effective knowledge sharing process depend.
3.6 SURVEY INSTRUMENTS

Questionnaire based survey is the main research instrument in this research. Some structured interviews have also been conducted to identifying issues related to the research.

3.7 RELIABILITY

The items for selected KM practice tools scale were formulated specifically for this research because there was no published reliability or validity data available. Questionnaire reliability was established prior to sending it to organization. A pilot study was carried out in few Indian IT organizations. They were asked to review the scale and answer specific questions regarding any ambiguities. The idea behind carrying out the pilot study was:

- To have fruitful feed back from the executives working in the area of KM.
- To add missing question, if any, missing in the questionnaire.
- Delete any irrelevant question.
- Refine/rephrase the language of the existing questions to bring in more clarity in the questionnaire.

A total of ten executives were personally contacted. Accordingly the questionnaire was modified and a final questionnaire was freezeed. It was then mailed to different organizations. A copy of the questionnaire is attached as Annexure 1 at the end of the thesis.

3.8 DESIGN OF STUDY

This study is exploratory in nature and conducted in phases. The first phase focuses with developing a view among different KM practice tools with facts and theories accessed from literature survey on IT sector.
The second phase of the study is an empirical study of IT firms, the research approach is survey research, through structured questionnaire and interviews. The standardized and validated questionnaire has been used for this. Hypotheses formulated and tested using SPSS (ver. 13.0) statistical tools.

For modeling the enablers and inhibitors of KM practices in IT firms, interpretive structural modeling (ISM) approach has been used.

3.9 SAMPLING DESIGN

**Sampling Unit:** The existing IT firms situated in Indian Geographical location has been used for the Survey.

**Sample Size:** A total sample of about 650 IT firms covered.

**Sampling Procedure:** The sampling plan is non–probability sampling from the Indian IT firms. Judgment and convenience sampling employed.

3.10 DATA SOURCE

**Primary Data:** A survey method was adopted as a primary source for collecting information from respondents. A well structured questionnaire send to them. The researcher developed a dynamic website of questionnaire and send link to all IT companies. The details of the questionnaire as follows.

The developed questionnaire was divided into seven sections as follows.

The first section deals with the general background of the organization and is directed towards understanding eliciting information about organization.
The second section focuses on knowledge creation process, strategic and softer issues of knowledge creation process, knowledge creation tools, knowledge creation enablers, obstacles in introducing new ideas, competitive priority and the type of knowledge critical to success in knowledge creation process etc.

The third section of KM – Questionnaire identifies with knowledge codification process, the IT tools used in codification process, old and new material reused intensity, knowledge gaps.

The fourth section pertains to knowledge storing process, wealth of knowledge, tools used for knowledge storing, introducing new concepts, obstacles comes around, competitive priority.

The fifth section revolve around with knowledge acquisition process, element contained in knowledge acquisition process, component support to knowledge acquisition process, tracking knowledge acquisition and obstacles in knowledge acquisition process.

The sixth section uncovers knowledge mapping tools, level of knowledge mapping, checking process.

Last section of questionnaire deals with knowledge sharing tools, factors involved in knowledge sharing process, level of success factors in knowledge sharing process, key factors encourage knowledge sharing and intensity of knowledge sharing process.

**Secondary Data:** Existing sources of secondary information tapped to supplement the primary data related to IT Organizations. Such possible sources are NASSCOM, CII, ASSOCHAM, PHD-CCI, Ministry of Information Technology and in house research by service organization and studies conducted by various organizations etc.

**3.11 DATA ANALYSIS**

The data collected through above process has been compiled and appropriately tabulated. The analysis of quantitative and qualitative data done using statistical techniques, keeping in mind overall objectives of research. Finally, the finding from the primary sources as
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well as secondary resources has been utilized keeping in view the research objectives and sub objectives. Statistical tools SPSS (ver.13.0) have been used to analyze the data and test for hypothesis, ANOVA and reliability analysis test conducted on the data set.

3.12 LIMITATION OF THE STUDY

No empirical study of the present type can be conducted if its scope in terms of its variables and sample of subject is unlimited. The time factor, practicability and resources make it more necessary that the study be limited in its scope. Thus present research has some limitations. These are as follows:

1. The present study is limited to Indian context.
2. This research is based on only six types of organization in IT sector. These groups of organizations are IT consulting, business process outsourcing (BPO), information technological enable services, software and hardware, networking, product design and system security, application development and maintenance, package implementation and IT education.
3. Only 650 Indian IT firms were contacted in the survey, out of which only 95 usable and complete responses were received. Thus the response rate was about 14% which is quite low.
4. Many of the important IT companies could not be included in the survey because their no response and lack of willingness to share internal data.
5. ISM model developed in this research considers only nine variables which are knowledge creation, knowledge sharing, knowledge acquisition, knowledge coding, knowledge mapping, knowledge storing, knowledge culture, knowledge capture and knowledge leadership, more variables may be added.