CHAPTER - IV

RESEARCH METHODOLOGY

In this chapter I have discussed the Research Methodology used for the purpose of investigation of the problem. The points, which I have referred, are -

(1) The Premise of the Hypothetical Propositions Tested

(2) Research Design and the choice of the Sampling Method

(3) Assumptions of Sampling

(4) Questionnaires and Interviews

(5) Method of analysis of Statistical Information

(6) Hypothesis

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RESEARCH METHODOLOGY

Introductory:-
The fundamental principles of Demand and Supply and pricing apply to the job opportunities available to the computer experts -

The demand aspect is revealed by the employers of computer services, who communicate their requirements to the educational institutions. The supply aspect is reflected in the efforts made by educational institutions to orient their computer education in such a way as to inculcate in students' personality the qualities and qualifications needed by the employers and create a new student profile. This process leads to fixation of the price i.e. the remuneration offered to the deserving candidates. These monetary prospects in turn influence the supply aspect. The peculiarity of this process is that the 'product' needed cannot be supplied within a short time. In other words creation and supply of the 'product' takes time no longer than in the case of manufactured products in industries. This implies that in computer industry elasticity of demand is more than elasticity of supply and this situation influences price of the product to a great extent. The analysis of the demand and supply aspects is made on the basis of primary data collected and future trends in job opportunities are found out.

1.*According to Prof. H.Odum* the case study method is a technique by which individual factor whether it be an institute or just an episode in the life of an individual or a group is analyzed in its relationship to any other in the group. Getting a lucrative job has been an important episode in the life of students with an appropriate profile as computer experts. The study of such individuals and institutions making a careful and complete observation of a social unit (person, family or institution) a group or an entire community points to a significant trend in employment during the period from 2000 to 2005.

Analytical study of a person or an institution, (as to what he does and has done, what he thinks he has done, what he expects to do in future or says what he ought to do) is the basis of a case history, which is a social microscope.

It can be said that my Research work is as described by Prof. Pauline Young 2.*an analytical study of a social unit-(person, group) or social institution a district or a community.

Note: 1.("An Introduction to Social Research P.229)
2.("Scientific Social Surveys and Research P.247)
It is a qualitative analysis based on observation of an important situation concerning individuals and institutions supported by statistical analysis of the primary data. Such a study is useful in -

1. recognizing and determining the phase or status of the problem
2. collecting and examining data which has historical reference.
3. formulating diagnosis and identifying causal factors as the basis for remedial measures and their application suggested for the given phenomenon.
4. getting feedback by follow up.

In the social science research, a phenomenon is influenced by numerous factors. However, some correlation can be found out between correlative factors. In the case of my research endeavor, the relationship between computer knowledge and skills and career opportunities in Business Administration is obvious. However, a study is necessary and interesting to know how different factors influence this relationship.

(1) The premise of the Hypothetical Propositions Tested:
(a) The fundamental assumption for education in business management and business administration is that management education in 21st century should be computer-technology based. Technology is best for business forecasting and planning. A student of business management aspiring for Master's Degree in business management and administration must be trained in project management, process management and change management. This implies that educative process is entering E-Business requiring mastery in E-com, MIS and IT management. Job opportunities are available for such technologically equipped business manager and administrator in 21st century, who shows his managerial and administrative skills in the following areas of management and administrative areas:

1) Production Management
2) Materials Management
3) Marketing Management (Purchases & Sales)
4) Financial Management
5) Personnel and Manpower Management

All these areas of Business Management have one implication viz. Management and Administration of M's (Money, Material, Manpower, Minutes & Methods).

Though traditional theory of business administration & business management
emphasizes the above mentioned basic areas of planning, decision making, coordination and implementations, many areas are added to business administration by the end of 20th century and will create job opportunities for the unemployed but aspiring graduates and undergraduates.

(b) Technology pervades various areas of Business Management and Administration e.g., Companies requiring managers in their Marketing Dept. select the candidate on the basis of his knowledge of CRM Technology. In the case of candidates chosen as managers by corporate and IT Industry for operations by system expect that the candidates selected should possess knowledge and skill in ERP and supply chain management. Thus, computer and technology knowledge of principles of Business Administration are complementary and not mutually exclusive.

(c) Industries connected with IT and other related indirectly with IT have necessitated the need for techno-MBA's. IT companies have launched campaigns of choosing suitable management candidates and have selected in their campus interviews the candidates possessing expertise knowledge in business and computer technology.

(d) In service industries, managerial job opportunities are available to MBA's as business analysts, for sales manager's consultancy, service, delivery needs. These jobs necessitate techno based MBA courses for graduates and undergraduates from all faculties (Arts, Science & Commerce). The basic requirement would be techno based business managers and business administrators having necessary aptitude and capacity to master skill in computer application in the various areas of decision making and implementation of decision with accuracy and precision thereby reducing risk element in a running business.

In view of the fact that the risk element in business administration is going to increase because of the atmosphere of the uncertainty created by unpredictable social, political and economical conditions, the need for techno based MBA's cannot be undermined. Business administrator in E-business and in E-Commerce has dual specialization. Apart from specialized 'system' knowledge, the various areas of Business Administration are overlapped and the approach in learning computer application has become multi-disciplinary. For example there is complementarily between such areas of specialization (chosen by aspiring candidates) as finance and marketing. MBA students get the benefit of expertise in functional system - CRM, ERP and e-commerce subjects. Consequently, there would be MBA students choosing marketing as area of specialization, like finance, operation and HRD. Student selecting telecom courses get the opportunities in choosing a suitable MBA course.

(e) The frame of offbeat commerce and business syllabi thus cannot be based on traditional course which were in vogue by the end of 20th century. The new job
opportunities created in 21st century will have no relevance and reference to such particulars as Schools, Colleges and Universities from where students obtains eligibility qualification for joining MBA courses or where the course has been or has not been recognized by government. Sky is the limit for techno-based business managers and administrators who possess expertise and skills in areas of e-commerce and e-business, web technologies, CRM, SCM, marketing, technological product and service. The prevailing competitive situation at national and international level competes acquiring expertise and proficiency in computer application in data management, business intelligence and intellectual property rights. Areas of skills in computer application know no bounds. They pervaded all science, arts and professions requiring qualities of head and heart for learning and teaching. For example, Hotel Management, beauty management, music, painting, various therapies in medicine, communicative skills, etc. For all the new courses opened for many faceted personality development and career development knowledge of computer and hardware and computer software is like oxygen the life- giving and energy - giving force. All round personality development and successful career planning in business administration are almost impossible in 21st century without the knowledge in computer application. Modern techno - based business education and business research encompasses various areas of specialization like advertisement, public relations, client-servicing, event management and design, layout, printing, production, medicine, plantation, animal husbandry, commercial agriculture, etc. in the process of multi-faceted personality development and career planning in business administration. When basic talent potential goes along with memory, decision making with precision, target hunting, commutation skill, and beauty culture are supported by possession of computer application skills. Basic problem of time and resource management can be solved with maximum economy and materialization of the desired and quick results. Computer age providing techno based knowledge of business administration and business management goes a long way in facilitating the process of business administration for survival and development in competitive and complicated situations.

All the above hypothetical prepositions can be well knit into a final hypothesis that - "Considering the general unemployment situation in India, new challenges created by the process of globalization, liberalization and privatization, a student belonging to any faculty must be fully equipped with computer knowledge and skill in its application, so that he can successfully complete the job offered to him by an outsider agency. Skill developed by him in computer techniques can be a great source of income and self employment. Interaction between industry (representing the demand aspect) and educational institutions (representing supply aspect) is the basis of convergence between demand and supply of the 'quality' product".

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The problem under investigation has many aspects like economic, social and cultural. When the problem has different dimensions, research method to be adopted for the purpose of analysis consists of different methods and specific research design indicating the coverage of the query. There is involvement of many individuals and institutions concerned with the problem. This requires a research method consisting of:

(a) Purposive sampling
(b) Case study approach

apart from the usual method of preparing questionnaire for collection of primary data to be tabulated and analyzed for drawing logical conclusions.

In the case of the research topic chosen, the economic aspects consist of demand and supply analysis and the social and cultural aspects are reflected in attitudinal changes leading to behavioral changes of persons and institutions concerned with the problem.

Purposive sampling method is used for choosing a sample from the population. The population for my study consists of:

(a) The students who aspire for becoming computer experts and get a lucrative job opportunity as careerists.
(b) The educational institutions which provide the candidates who are well equipped with the necessary computer knowledge, expertise and acumen as required by the employers.
(c) The employers who communicate from time to time their requirements to the educational institutions, conduct campus interviews for selecting suitable candidates from among the available students who take education in the various institutions providing computer knowledge and its application for business problem solving. In the Research Design chosen each unit selected has equal chance of selection.

The students provided by the educational institutions and recruited by the employers represent the supply aspect of the problem. The employers recruiting candidates according to their needs represent the demand aspect of the problems. It is interesting to observe what kind of convergence between demand & supply occurs in the field of computer-career opportunities.

Case study method or Survey Method is also considered suitable for the purpose of analysis. Research design is concerned with what, why, where and what type of data are required and where data will be found in a given period of time.
The observations concerning the inquiry are followed by the decision regarding sample design dealing with the method of selecting items to be observed from the population. Non-Probability sampling design or purposive sampling or judgment sampling method is used implying deliberate selection of units understudy. The case study method is useful for qualitative analysis of data collected directly from the sources. (Horse’s mouth)

The response to the queries made through structured questionnaires and interview is quite dependable when information given is without any reservation.

(3) Assumptions of Sampling

The basic assumption in selecting a sample of -
1. The employers- (recruiters)
2. The educational institutions.
3. The undergrad students, students possessing management degrees (MBA’s and MMS’s and the graduates) is that recruiters while getting quality manpower for business administration have to operate in a competitive market. The educational institutions (schools, colleges, management institutes) on the other hand also compete aggressively while providing supply of quality stuff (candidates). The candidates, aspiring for lucrative job opportunities (responsible positions in business) apply to fewer employers’ expect higher salaries and make employment decisions while getting educated in computer management. The educational institution-preparing candidates for important jobs have been responding to the demand of the employers. This demand has been constantly shifting to top talent.

Accordingly a sample consists of:
1) 100 Candidates possessing post graduate qualification with the knowledge of computer and skill in computer application.
2) 200 graduates from different faculties
3) 10 educational institutions
4) 100 Undergraduates and school goers completing their secondary education.

The problem is concerned with emergence of new employment opportunities for the graduates and undergraduates in the era of computers during the period from 2000 to 2005 in the 21st century. Such a study is important in view of the general problem of unemployment for the youngsters who aspire for a lucrative job. That ample opportunities are available in the field of computer management is
obvious from the historical data relating to the offers made by the employers to graduates and undergraduates possessing computer knowledge and its application in various fields.

(4) **Questionnaires and interviews.**

Structured questionnaires were prepared for recruiters (employers) and their HRD managers governing personnel policy of their company. The graduate and undergraduate students were contacted directly or through postal correspondence. Their positive and 'concerned' response have thrown light on the following issues:-

1. Which career is most attractive to aspiring candidates?
2. What is employer's choice of candidates?
3. Do companies offer most lucrative compensation?
4. How much candidates expect to earn?
5. Which Companies do 'best job' recruiting on campus and why?
6. What is the nature of industry institution interaction?
7. What are the efforts made by educational institutions to maintain and upgrade 'quality' of candidates to meet the changing requirements of industry?
8. What is the nature of campus recruitment tactics? Which are successful?
9. What is the nature of convergence of the demand aspect and supply aspect of the problem?

Primary data obtained by answers to the Questionnaires and in the personal interviews and their tabulation and analysis would enable drawing of logical inferences.

(5) **Method of analysis of Statistical Information**

This research work is basically in the Faculty of Commerce. Its objective is to analyze the details of relationship between computer education and its impact on employment levels, job or career opportunities in the various areas of business administration. As it is a study in the faculty of commerce, advanced and rigorous statistical and mathematical techniques and use of technological details are eschewed.

However, for facilitating trend analysis simple statistical techniques of measuring central tendencies, dispersion, correlation and extrapolation are used. They are found suitable for tabular presentation and analysis.
Measure of central tendency enables finding out a simple value that describes the characteristics of the entire group and central tendency of a variable over a period. Such characteristics are changes in the average index of earnings (income), employment (demand & supply) of students who possess the necessary knowledge in computer application (programming), demands from employers in computer industry and supply of students made by educational institutions and the trends in employment opportunities and required qualities and qualifications of students aspiring from making a successful careers in the field of computers. Trends in these variables and their relationship over a period can be measured and analyzed by correlation analysis, measures of deviation or dispersion and exploration.

Extrapolation technique enables estimation of a value which is not available in a given series but which can provide values predicted for a future period i.e. values of employment opportunities (that could be provided to a students) after 2005 or 2006 can be found out approximately when a given trend is known for the previous period. A value of a variable for future can be projected for the future provided values of variables are collected regularly over a period and these values must reflect a certain trend. There should not be sudden fluctuations (junks) in the series and a definite trend should be visible for adopting extrapolation method of analysis.

When there are many variables interlinked with each other the degree of correlation between them should be calculated. e.g. requirements of industries of changing computer codes indicating new job opportunities and the general trend of the employment opportunities in computer industry over a period of time. This has macro reference.

Extrapolation is used for finding out computer job potential in future. Analysis of time series has enabled -

1. understanding of past behaviors of variables
2. finding out suggestions for planning future operations of industrial employers and educational institutions and students.
3. evaluating current accomplishments of IT industry
4. comparative study of trends of variables in the past and future predictions e.g. original trend, secular trend and cyclical or irregular variations in trends over a period.
Primary and secondary data

In the research project, information from primary and secondary sources was made available by a structural questionnaire in respect of candidates possessing computer knowledge and application skills and the resultant changes in the supply of quality products (the students as would-be employees) made by educational institutions which are the two variables intimately related with each other. Correlation analysis enables the study of close relationship between the related variables. Therefore, in the case of this research project measures of central tendency and dispersion, correlation and extrapolation technique have been used for the purpose of analysis of primary and secondary data. The time series analysis made of the primary and authentic secondary data collected directly from the sources with the help of structured questionnaires and by interviewing the concerned persons and institutions, and authorities on the subject has enabled-

1. Collection of factual, statistical observations and their arrangement in a chronological order
2. Recording observation and tabular analysis over successive increments of time. (In other words, quantitative data are arranged in order of their occurrence.)
3. The values of variables are traced and analyzed chronologically e.g. number of students qualifying themselves for making a successful career in computer world, their faculty-wise breakup, the undergrad seeking computer jobs, the number of placements made by industrial employer, the number of students interviewed by the employer and experts in educational institutions by-
   a) Direct personal interviews
   and
   b) Indirect oral interviews

Information from respondents given for mail questionnaire has been organized and analyzed and question-wise commentary is prepared. Such methods are used for intensive survey. As a source was authentic, high degree of accuracy was assured for the purpose of drawing logical inferences. Collection agencies like industrial employers and educational institutions and government organizations responded positively to the appeal made in the questionnaire for supplying information without reservation. The structured questionnaire to the students, HRD managers, Government Officials and Head of Departments in educational institutions was designed specifically to cover all the possible and relevant dimensions of the problem under investigation. Authentic
secondary data was referred and complied everyday in the reports, journals, and research papers. Reference to the published authentic data has enabled getting a clear picture of the problem and has facilitated greatly analysis of primary data and corroboration of conclusions drawn from the analysis. Exhibitions organized by different organizations in computer education were visited and the related literature was collected and interpreted.

**The Hypothesis Tested**

1. The hypothetical propositions which are logically correlated with each other point out the fundamental relation between Computer education and its effect on job opportunities available to a computer programmer - a careerist in the field of Software industry. There is a positive correlation between employment potential for a computer careerist and the level of education knowledge (expertise) and computer programmer's skill of application of detailed instructions (programmes of a software) which a software engineer develops himself through research and application. A computer programmer's constant task is to write, test, maintain and apply in a logical order, the programmes which computers must execute. Computer programmers are highly qualified 'technicians' possessing a high level of theoretical expertise. Thus, they play the triple role of scientists, computer engineers and system analysts. Apart from being a 'graduate' of any faculty after undergoing study of a particular curriculum of a University, a Computer expert (scientist, engineer or a technician) can make a successful career in computer application without becoming a graduate. Potential for becoming a computer programmer does not depend on acquiring a 'degree' of the University and solutions to the problems are found out by drawing and analyzing data from the existing systems. Continuous hard work of revising programmes must be carried out through vigilance over advancements in Computer technology.

2. The role of a computer programmer is very dynamic i.e. constantly changing because of the following factors -
   (a) technological renovations in programming.
   (b) discovery of advanced computing technologies.
   (c) discovery of new languages and programming tools.
   (d) rising level of education and specialised quality training required by the employers necessitated by emergence of business management and administration problems everyday.
   (f) necessity of updating programmes so as not to allow them to get obsolete.
   (g) a simple programme leading to complicated programmes based on complex and advanced mathematical formulae.
the interaction between an employer recruiting a computer careerist and the educational institutions grooming students for the computer career bring about balance between demand aspect and supply aspect of the problem of employment of 'qualified and 'quality' products in computer field.

This is an empirical study consisting of my observations on the profile of students going to the computer and Management Institutes and aspiring to become a computer expert by gaining not only the theoretical knowledge but also by acquiring the necessary occupation through application of the computer knowledge and skill. There is an awareness among the students about what industry requires. Students' knowledge about the demands from employers is gained through their interaction with industries. This interaction has been greatly facilitated by the continuous effects made by the educational institutions in this direction. The educational institutions are equipped with a capable teaching faculty as well as the necessary infrastructure and paraphernalia to enable the students to make a significant career in the field of computer education. The management institutes and the examination boards serve as the via-media between the aspiring students and the industries which are interested in recruiting capable computer trainees who later on may be placed in executive positions. The industries doing placements of students through campus interviews have been in search of talented promising students. This is the talent hunt process.

6) Hypothesis

The employment potential of manpower (labour) is like other commodities, subject to the laws of demand and supply. Other things remaining the same -

(I) Rise in the level of employment potential for computer experts depends on the demands made by employing companies (industrial units) and the level of these demands has been rising during the period 2000-2005 and consequently the remunerative prospects for the employees have been improving.

(II) the bettered prospects for the computer experts have led to increasing tendencies on the part of prospective students (graduates, undergraduates and school goers) to opt for computer courses for career building in Business Management and Administration.

(III) the educational institutions and management institutions imparting instruction in the technical lines and in management have recognized the changing needs of industries (recruiting companies) and accordingly have been making consistent
and continues efforts to improve. The qualification and quality of aspiring have improved for challenging fields of computer application.

(IV) thus the growing employment potential for computer experts has been the result of rising demand on the one side and the resultant growth in the supply of computer experts on the other. This situation reveals a positive correlation between demand for and supply of computer professionals (analysts and programmers and other codes) in the computer industry in India.

Sampling, Questionnaires and Interviews

A) Sample size
Supply and Demand Aspect:
(1) Cases - Educational Institutions.
(2) Student Profile - graduates, under graduates.
(3) Recruiting Companies - Industry- Institute Partnership Reactive.

B) Questionnaire & Interviews:
(1) SI Report
(2) Industry Institute Interaction Study -
   Prof. Dhananjay Keskar (HRD Manager).
(3) Resource Mastigation Study by Dr. Sudhir Rashinkar
   (HRD Manager).
   Services of the Gammadion Boards.
(4) Industry Institute Interaction for grooming professionals placements -
   Effects
   University of Pune
   MCCIA
   Bharati Vidyapeeth.
(5) Study of Examination Boards
   PACE - Prof. Subhash Pawar
   Chairman Pace (P) Ltd.
(6) Industry Institute Partnership Interactive.
   MCCIA & Pune University & other Sponsors.
(7) IIMP
(8) Infosys
(9) ISPM - Institute of Computer Applications.
(10) Vasavi College of Engg. Hyderabad.
(11) Indira Institute of Mgt. & I.T.

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Analysis in this empirical study is based on experimental knowledge of the subject or the problem under investigation. As a teacher and the Vice Principal of a renowned College run by Shree Chankya Education Society, I had to face several queries about the prospects of students making their career as computer analysts or computer engineers. I had been studying the present scenario in the field of technical and management education. The scenario - the postulated sequence or developments of events in the life of educational institutions imparting knowledge of computer knowledge and technical skills suggested to me the Hypothesis and its testing has been greatly facilitated by cooperation from industry and educational institutions which conduct parallel activities of training the prospective students and bringing about their overall personality development through curricular and extra curricular programmes. These parallel activities like project planning, problem-solving application of computer knowledge, seminars, group discussions, industrial visits, competitions are not mutually exclusive as they are conducted by mutual negotiation and consultation.

The case studies included in my thesis are representative of this important trend in the field of management and computer education. The conclusions drawn from the illustrative case studies are based on factual knowledge of bare facts and therefore are not hypothetical. The various propositions regarding availability of career opportunities to students consequent upon their gaining up to date computer knowledge expertise and application indicate that students who possess the necessary acumen in applying their computer knowledge and innovative skills for problem-solving or sky is the limit for their elevation in the career in computers. Presently, such examples are not numerous but in the near future - say by 2010 ingenuity in computer application is going to be rewarded sumptuously irrespective of whether or not a student formally possesses a degree in any faculty of a University. Even education 'fall-outs' can make a good career in computers provided they have the necessary aptitude and skill.

Appropriateness of Case Study

'Job potential for computer careerists', a case is a phenomenon or an event or an episode which requires investigation and search for urgent remedial measures for concrete solution. In this case - research method consists of taking out chronological account of the emergence of the problem and studying the various arguments and counter arguments for discovering proprietary of action taken so far. Such a case study also throws light on whether and how long the problem has been neglected and the factors leading to consequent aggravation of the problem. The different parties involved in dealing with a problem have their own points of view which require analysis and follow up.
The case studies included in the Research Study are relevant to the problem under investigation because -

(1) The case study undertaken point out how frequent action - oriented plans are necessary from time to time to solve the problem, recurring again and again.

(2) They contain incidents and episodes wherein the persons and institutions, being aware of the recurring actions were always keen to take steps to remedy the problematic situation.

(3) They point to examples, circumstances or conditions wherein the appropriate measures taken by the people, institutions concerned brought the desired results enabling them to take improved line of action in future so that some problem - areas were taken care of and strategies were evolved for getting innovative solutions for the other unknown problematic areas. Inquiries were conducted, problems were heard by inter-action among the people involved and dialogues took place, generating debate and adopting multidisciplinary approach for the different dimensions of the problem.

(4) They reveal the fact that the persons and institutions concerned are receptive to different challenges to be faced and tackled from time to time. They also indicate how dynamic are their plans and actions for dealing with the different aspects of the problem. These plans indicate how the people with their foresight and anticipation can adapt themselves to changing environment and demands of the hour. Not only plans and programmes of action are prepared on paper, they are executed without loss of time and consequently, the desired results are obtained. There is also follow up and feed back facilitating this process.