CHAPTER - 2
REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The primary objective of the present study is to develop projective technique based system for career exploration in Information Technology. Thus, it has got two dimensions i.e. projective technique and career exploration. A number of studies are available in India and abroad on projective techniques and a number of devices were developed on the basis of projective hypothesis. But almost all of them purport to measure personality dimensions and allied areas. These personality devices have wider use in the recruitment of personnel in industrial organisations. A number of career exploration devices were developed, the basis of which was mostly individual's interest and preferences. A good number of studies were conducted on individual's interests with respect to choice of vocation, career or education. Semi projective types of interest inventories were also developed by Chatterjee (1960) known as Chatterji's Non-Language Preference Record, Form 962 and Balakrishnan (1979) popularly known as Vocational Preference Inventory.

In this chapter several research studies related to projective techniques and vocational interests along with occupational preferences and career exploration are reviewed.
2.2 REVIEW OF LITERATURE RELATED TO PROJECTIVE TESTS

2.2.1 Basis of Projective Tests

The discovery of Psychoanalysis by Freud (1894) became the basis of all projective methods. Freud in applying psychoanalysis observed the importance of studying the relationship between the therapist and the subject. This further led to the development of projective techniques.

Projective techniques are based on the phenomenon of projection. Here it is presumed that individuals try to project their inner feelings, attitudes, attributes, likes and dislikes on the external environments, thus human beings have a tendency of projecting their inner world of imagination on the objects of environment. In Projective tests, some unstructured or semi structured material is provided to the subject so as to enable him to project his inner world on the object. The subject is allowed to structure the unstructured or semi-structured material in any way he/she likes. In doing so, he unconsciously projects himself and reveals his personality, likes or dislikes. The more vague the situation, the better the chances are there for the subject to project. The common unstructured or semi-structured objects used in projective tests are vague and ambiguous pictures, inkblots, incomplete sentences, model clay, paper and finger paints, haphazard lines, somatic ink blots etc. These Projective tests give access to the deeper levels of personality. In that respect they are superior to inventories and rating scales or questionnaires. Some of the important projective tests are – Rorschach, Thematic Apperception, Senior Apperception, Make a Picture story,
Children Apperception, Sentence Completion, Rosenzweig Picture Frustration, Drawing Completion, Drawing the Human Figure, Story telling and Completion, Cassel's Somatic inkblot Series etc, (Dosajh, 1996). Needless to mention that so far maximum number of research work have been conducted on Inkblot test and Thematic Apperception Test.

Projective technique is a device for studying the inner life of an individual through his behaviour manifestation. Jung's (1910) utilisation of free association method contributed to finalise the Projective techniques and Rorschach (1942) developed the Projective Technique into a highly scientific method.

### 2.2.2 Word Association Tests

One of the important projective methods is Word Association Test which goes back to as early as 1879 to the work of Francis Galton. Jung and other clinicians made use of the technique from the beginning of 1906 as a quick means of detecting "complexes".

The most well known of the word-association tests is the one devised by Kent and Rosanoff (1910). This test was developed with the purpose to differentiate between the mentally ill and the normal individuals. The words used in this list were neutral in character. The determination of the normal and abnormal responses were based upon the frequencies of word association of 1000 normal and 250 psychotic subjects. The table of response frequencies was developed with the percentage of most common, less common, and uncommon replies. It
was envisaged that the percentage of each category might differentiate the normal from the abnormal.

Jung's Word Association Test (1918) consists of a list of one hundred words selected to represent common emotional complexes. The subject is told that the examiner will tell a series of words, one at a time. After each word, the subject is to reply as quickly as possible with the first word that comes to mind. There is no right and wrong response. The examiner is to record the reply to each stimulus word, the reaction time, and any unusual speech or behaviour manifestations accompanying a given response. Jung believed that when a stimulus word was relevant to an emotional disturbance of the subject, an unusual response would be given.

The latest of the Word Association Tests series was developed by Rapaport et al (1946). This test is tended for use as an aid in diagnosis and in estimating degree of maladjustment and impairment of thought organization. The word list is heavily loaded with stimulus words of psychoanalytic significance. The words and interpretation of responses are based upon an analysis of Psychological Processes involved in Word Association i.e. Construct Validity.

There are several determinants that influence Word Association which must be taken into account in utilising tables of response frequencies and in the interpretation of responses. (Rapaport, 1942).
2.2.3 Sentence Completion Tests

Sentence Completion Test is one of the projective devices where the subject is supplied a series of incomplete sentences, generally open at the end and these are to be completed by him/her with one or more words. The sentence completion test is regarded as superior to Word Association Tests because the subject has the freedom to use more than one word. Thus there is greater flexibility and variety of responses is possible. The fully described and frequently used instrument in this area are Rhode's Sentence Completion Test (1957) and the Rotter Incomplete Sentence Blank (1947). Both these devices are designed to estimate the degree of maladjustment and the areas of maladjustment of the subject. These types of tests have been found to be useful for identifying areas of behavioural problems and for providing diagnostic clues.

2.2.4 Drawing Tests

Projective techniques are available on Story Completion, Drawing and Painting. Among these projective techniques utilising drawings is the Draw a Person Test (Machover, 1949) is the popular one. This test is used with individual's of 2 years of age and older, as it requires a subject to "Draw a person". When the first drawing is completed, he is instructed to draw a person of opposite sex. When the subjects complete the drawings, he is asked to tell a story about each person he has drawn. The examiner may ask a series of prescribed questions about the "characters" to older subjects. The analysis and interpretation of drawings are based upon the hypothesis that they represent one's conception of his body in
the environment. Karen Machover has used and experimented with this device for a number of years and has made accurate and insightful personality interpretation with it.

2.2.5 Inkblot tests

It is reported that as long back as 1848 Dearborn published the results of applying an inkblot to a group of sixteen subjects. Dearborn, while working in Harvard University published an article in 1897 discussed the potentials of employing inkblot techniques in experimental psychology.

According to Exner (1969), "More formally, there was in Europe and the United States, considerable experimentation attempted with inkblot, as test of imagination, personality and intelligence". Holtzman (1956) pointed out that much of the controversy over the Rorschach arises from the failure to distinguish between the Rorschach as projective technique in the hands of skilled clinicians, and the Rorschach as a psychometric device, that yields scores having relevance for personality assessment.

Rorschach (1942) developed Psychodiagnostics, a diagnostic test based on perception. He developed the tool through experiment which consisted of interpretation of accidental forms or non-specific forms. A few large ink blots were thrown on a piece of paper, the paper was folded and the ink spread between the two halves of the sheet. Every figure in the series has to fulfill certain special requirements and each one of a suitable series of ten figures must
be thoroughly tried out before acceptance. The Subject is given one plate after
the other and was asked, what might this be? An attempt is generally made to
get at least one answer to every plate, though suggestion in any form of course
avoided. Almost all subjects regard the experiment as a test of imagination. But
the interpretation is done on the basis of the perception of the subject and his
appreciation rather than imagination. The interpretation is carried out according
to the following scheme (Rorschach, 1942).

1. How many responses are there? What is the reaction time? How
   frequently is the refusal to answer encountered for several plates?
2. Is the answer determined only by the form of the blot, or is there also
   appreciation of movement or colour?
3. Is the figure conceived and interpreted as a whole or in parts? Which are
   the parts interpreted?
4. What does the subject see?

Holtzman Inkblot technique (1961) is an interesting development with certain
variation in the original Rorschach method. Holtzman's technique consists of two
alternate forms, each of which has forty five cards. The most important variation
here is that the subject is instructed to give only one response to each card. The
major advantages in this technique are:

1. the total number of responses is controlled and relatively constant from
   subject to subject, but still the number is large enough to be significant;
2. intercomparisons of individuals are more meaningful because the number
   of responses are relatively large and constant;
3. as the alternate forms are used here, it permits sounder estimates of
   reliability for each variable.
Regarding validity, Holtzman et al (1961) stated that Rorschach and the Holtzman systems have a great deal in common.

Dosajh(1997) came up with few interesting case studies where he attempted to establish how a single image of Somatic Ink-blot series II(SIS-II) helps in psychodiagnosis. The first was of a young man aged 21 years, a student of second year B.E of an Engineering college. The second case was again of a young man of 24 years who completed his graduation. After a tryout of number of instruments, when SIS-II was administered, the image-18B lead to Diagnosis. This can be considered as one of the important studies in the field of projective technique which proves scientifically that even in certain cases one particular test item or picture card can serve the diagnostic purpose or explanation purpose.

2.2.6 Picture Frustration Test

Rosenzweig (1945) conducted a number of studies on picture frustration during 1944-1949. The full name of his test is "Picture Association study for assessing Reaction to Frustration". The test consists of 24 cartoon-like pictures, intended to serve as a Projective method for revealing the subjects' characteristics and patterns of response to common stress producing situations. These situations are regarded as important in normal and abnormal adjustment. Two forms of this test are available, one for children of aged 4 to 14 years and the second one for persons older than 14 years.
Each picture shows two persons involved in a frustrating situation of common occurrence. The task of the subject is to examine each picture and to write in the blank box, the first appropriate response that occurs to him. The assumption is that the subject identifies himself consciously or unconsciously, with the frustrated individual in each situation and that his replies are projections of his own ways of acting. This picture test differs from others in being relatively structural and in serving a limited purpose. The situation which are devised and presented are of two kinds, ego blocking and super ego blocking.

Scoring of responses is based upon direction of aggression and reaction type. The responses to the frustration pictures are intended to show the individual's frustration tolerance, which signifies the relative absence of observable disorganization in response to frustrating situations. Frustrations are common experiences. Modes of adjustment to them are significant in understanding behaviour and personality organization as these modes serve one's ways of coping with tensions. Pictures of the Rosenzweig test are intended to evaluate an individual's tendency to blame the source of his frustration on himself or to treat the situation impersonally. Although the Picture frustration study has some of the reliability and validity problems like most other projective tests (Bernard, 1949; Smith, 1958) it has justifiably found to be useful with clinicians.

The present study on Projective Technique Based Career Exploration System has got some similarity with Rosenzweig (1945) projective technique with respect to relative structure and serving a specific purpose. In the present study the Multimedia frames are also relatively structured and can serve only a specific purpose of exploring careers in IT.
2.2.7 Thematic Apperception Tests

Atkinson (1958) developed a standard six picture Thematic Apperception Test, popularly known as Test of Imagination. McClelland (1961) used Thematic Apperception Test to record thought samples, which he studied and grouped according to the dominant concerns, or themes expressed in the stories. He and his co-worker were able to group the responses into three broad categories, each representing an identifiable human motive.

The work by Atkinson (1958) gives a standard procedure to use six picture cards to find out human motives, i.e. need for achievement (n-Ach), need for power (n-Pow), and need for affiliation (n-Aff). All the six picture cards depict unstructured situations. The purpose of this exercise is to help the individual to identify the motivational themes he or she expressed in the Thematic Apperception Test stories and thus to help the individual to unearth his or her motive pattern and dominant motive.

The Subject is asked to use his or her imagination to create ideas and situations by himself or herself. The series of six pictures are presented before him or her one at a time and asked to develop a story for each picture. To help the subject to cover all the elements of a story plot in the stipulated time he or she is asked to consider the following four questions:
1. What is happening? Who are the people?

2. What has led us to this situation? That is, what has happened in the past?

3. What is being thought? What is wanted? By whom?

4. What will happen? What will be done?

The subject is reminded that the questions are only to guide thinking, and need not be answered specifically in so many words. Stories need to be continuous and not just a set of answers to these questions. The subject is asked to make stories interesting and dramatic.

Each story is analysed against certain standard responses and the motive patterns and predominant motive of the subject are found out. The Test of Imagination takes care of not only primary social motives but also other motives present in the story along with other major concerns.

Atkinson (1964) in his book on Motivation has discussed in detail the psychoanalytical assumptions of the Thematic Apperception Test and the objectivity of TAT which are all related to the present study on Projective Technique Based System for Career Exploration. He has quoted the work of Feld and Smith (1958), who designed and tested self training manuals for analysis of achievement, affiliative, and power related content of thematic apperception stories. They found that the median scoring reliability in published studies of the achievement through 1958 was .89. This can be considered as one of the encouraging signs of attainment of objectivity in the use of the projective test of TAT.
Chowdhury (1967) brought out the Indian modification of the TAT which is a uniquely sensitive tool for the dynamic interpretation of the many different facets of personality. While bringing out the modification of TAT to suit Indian situation, the categories of differences between the European and the Indian society and culture were kept in mind. In certain respect Indian Social situations do not have counterparts in Euro-American society as prototyped in the original Murray's cards. Chowdhury (1967) while selecting the pictures, first used her imagination. She took the help from pictures published in the illustrated journals. They were substituted by photographs from life models. These photographs have additional properties like gestures and postures to suit the purpose of the tests. Seventeen cards were drawn and tested on a small sample and 15 cards were selected. These 15 cards were administered to 260 individuals of rural and industrial areas in South Bengal. Out of this 15 cards, 14 were finally chosen as the TAT cards.

The adapted version of 14 TAT cards were applied to the upper and lower sections of the Hindu community and to the Muslims and altogether 3,300 stories were collected which were analysed separately according to their content and form. The responses were found to reveal quite satisfactorily the inner drives and repressed wishes of the individuals.

Murray's (1971) Thematic Apperception Test (TAT) consists of nineteen pictures printed on white bristol board and one blank card, thus a total of 20 cards. The 1971 version is the third revision of the original set distributed by the Havard Psychological Clinic, Massachusetts, USA in 1936.
TAT is found to be useful in any comprehensive study of personality and in the understanding of behaviour disorders, psychometric illness, neurosis, and psychosis. The test is not suitable for children.

In usual TAT the picture cards are presented to the subject and he is encouraged to tell stories about them, framed on the spur of the moment. The subject leaves the test happily, unaware that he has presented the psychologist with what amounts to an X-ray picture of his inner self. Certain pertinent data related to the subject is required for analysis and interpretation. These include sex, age, information about parent, siblings, his vocation and his marital status. While dealing with the content of the stories, the successive events are analysed into (a) the force or forces emanating from the inner psyche and (b) the force or forces emanating from the environment. In any event the conclusions that are reached by an analysis of TAT stories are considered as "leads" or "working hypotheses" to be verified by other methods (Murray, 1971).

Aaron et.al (1971) attempted to standardise five TAT picture cards with the purpose to measure n-Achievement of high school boys. They defined motive as a relatively stable disposition to strive for rather general kinds of goal objects. The attainment of goals is accompanied by feelings of satisfaction. Therefore in this study motive is referred as n-Achievement. To study this motive, researchers identified five pictures depicting scenes that are common in the life of a high school boy from South India which were considered as an instrument for the study. The sample of the study was 10th standard boys. The sample size of the study was 800 boys from 11 high schools.
To establish construct validity of the instrument, researchers asked the teachers from 9 high schools (where the instrument was tested) to name four highly motivated and four poorly motivated boys from their respective schools. The n-Achievement scores obtained by these two groups of boys on the instrument were utilized for biserial coefficient of correlation. This coefficient of correlation gives the construct validity of the instrument. To establish the predictive validity of the instrument, correlation coefficient between academic achievement marks and instrument score of the identified sample were used. To establish the reliability, test-retest reliability technique was adopted in this study. For this purpose, the instrument was administered among 35 boys of 10th standard at an interval of one month.

Norms of the instrument were expressed in t-scores. These t-scores adopt one tenth of a standard deviation as its unit. For interpretation of norms, the combined scores of the five pictures were used. The scoring of the stories was based upon the procedure suggested by McClelland, et al.

Mehta (1976) developed his inventory, known as Achievement Values and Anxiety Inventory. The inventory contains 22 items, which are descriptive statements of situations depicted in pictures. These items were tried out for the development of Thematic Apperceptive measure of Achievement. Each item is followed by six responses and these responses are based on stories written to TAT type pictures. Two each of the six responses are achievement related (AR); task related (TR); and unrelated to achievement (UR). Subjects are asked to check one response to each item. The difficulty values of the selected items
ranged between 25 to 70 percent with the median difficulty at 42.83 and the discrimination values ranged between .25 and .75.

Gupta (1977) contributed to Thematic Apperception Technique by developing a set of cards which contains common social situations and family relationships as observed in Indian culture. In his manual he has quoted Shukla (1977) that the original TAT fares better than the available modification in the market. In this test, 45 pictures of situations, both urban and rural setting was photographed. The final test consisted of 12 picture cards, of which 4 cards are related to themes on men, 4 cards related to the themes of women and 4 cards related to the themes on men and women combined. The test is administered by using Murray’s (1971) instruction. The administration of the test is followed by a short enquiry about the details of events and situations described in the stories.

Gupta (1977) observed that the reliability and validity of the observations, especially of a test like TAT largely depends upon the pattern of data analysis and the motivational level of the subject.

Chowdhury (1978) brought out Indian Adaptation of Senior Apperception Test (SAT). The Senior Apperception Test was originally developed by Bellak (1975). The Indian SAT consists of 16 picture cards with situations drawn to reflect the feelings and thoughts of the aged population so also the adaptations and coping between the generations. The first seven cards of Indian SAT have some basic similarities with the situations in Bellak SAT and these situations were depicted through different social media. The other nine cards of the Indian set were drawn specially according to the needs of the Indian cultural pattern. The test results
reflect human development sequence through different stages of life. The growth, development and coping mechanisms between the adolescents and adults in the family constellation can be found out through SAT.

Mehta (1978) developed an Achievement Motivation test for Indian Schools. The test is based on n-Ach theory. To develop the test the pictorial cues from the Thematic Apperception Test were selected with respect to the following criteria:

1. Cues which suggested situation, with the property of arousing achievement imagery
2. These situations further related to experiences of high school students
3. These situations were familiar to the students irrespective of the socio-economic backgrounds.
4. The sex and age of the character of the pictorial cues were similar to that of the high school boys.

To develop this Achievement Motivation Test, a number of pictures from different magazines, newspapers, journals and other similar sources were consulted and suitable pictures were identified from all these sources in terms of the above stated criteria. Out of the acceptable situations through various phases of editing and tryout, the six pictures were finally selected which had positive correlation with the school marks. The reliability of the original study ranged from .56 to .73. The validity of the study was established through theoretical validation. Validity indices were also found out against several criteria including teacher assessment, and these indicated significant result.
Mehrota (1998) conducted a study on TAT with the purpose to re-examine TAT alexithymia indices. She used the scale of Emotional Arousability (Braithwaite, 1987), the Courtald Emotional Control Scale (Watson and Greer, 1983) and sets of three TAT cards. These were administered to a sample of forty students (mean age 16.5 years). Moderate to high positive correlation was obtained between TAT alexithymia indices. Upholding the hypothesis of the multidimensionality of alexithymia, the results suggested the utility of separately examining the intercorrelated but distinct TAT indices of alexithymia. The findings also suggested that imaginative thinking and affective preference indices as assessed were un-correlated and thus probably distinct from emotional arousability and emotional control.

2.2.8 Tactile and Auditory Projective Tests

Battacharya (1968) developed new types of tactile and auditory projective tests. His work consisted of two parts, namely development of tactile test and development of auditory test. Tactile test is merely presenting a series of solid materials of ambiguous shapes and subjects are asked to give the responses after touching them blind folded. This test consists of 15 items which are mostly unstructured and made up of plaster of paris. Adults of both the sexes were considered for the study. Random sample techniques was used to get the required sample for the study. Sample size of the study was 100 adults of both the sexes. Validation of the test rested on the assumption that the test will discriminate between various criterion groups formed for the purpose of comparison. Chi-square test was used to find out the discriminate between the
various criterion groups. It was found that 12 items out of 15 items distinguish various criteria among the practical groups to a significant extent. To establish the reliability, test-retest technique was adopted in this study. For this purpose, time interval between the test was about 6 months. The reliability Coefficient obtained for the test was 0.78.

Auditory test means some natural sounds which are ambiguous were considered as projective test. This test consists of 10 different natural sounds which are ambiguous but significant. The test was constructed with the assumption that auditory material is an effective medium of personality study of an individual. The test was administered in a semi-dark room with a quiet surrounding; no fixed time limit was given. Validation of the test was attempted in the same manner as in the tactile test. To establish reliability, test-retest reliability technique was adopted in this study. For this purpose, time interval of 6 months was maintained between the tests. The reliability coefficient obtained for the test was 0.69.

2.2.9 Projective Psychology in the new Millenium

Panek (2001) published his thoughts in an editorial article titled “Projective Psychology in the new Millenium”. In this article he has discussed his perspective on the issues and challenges before Projective Psychology in the new millenium. If projective technique is to survive in the future, researchers will need to adequately demonstrate reliability and validity of the particular projective technique. Secondly, projective psychology needs to address cross cultural differences as well as ethnic differences within culture. As World has become a global village projective techniques must be able to adequately measure and
explain potential cross cultural and ethnic differences in scores or responses. Further, projective techniques must definitely confirm their utility or effectiveness in clinical and applied settings. Finally, initiative needs to be taken to highlight the contribution of projective techniques in the assessment of treatment outcomes, prediction of behaviours, industrial selection as well as personality assessment.

Verma (2000) provided some insights into popular misconceptions about inkblot techniques. Sometimes it is stated that “these are unstandardised techniques and not tests”. Take the example of inkblot techniques, which are standardised as any other psychological instrument or test, where stimulus are fixed and so are the instructions and administration. The standardised instruments get blamed for any unreliability of the results, where as the actual blame lies elsewhere. At times one might say that Rorschach test uses inkblot technique or method, in the same way the Minnesota Multiphasic Personality Inventory (MMPI) uses questionnaire method without downgrading them in any way. It should not make a difference whether we call a projective test as a projective technique or vice versa. Both are standardised ways of comparing the behaviour of two or more persons or groups at any given time.

Then, questions are raised about reliability and validity of the instrument. It may be noted that any single statement about reliability and validity for any single inkblot technique would be incorrect and incomplete as there are scores of variables, indexes and ratios present in each technique. Thus, misconceptions in this area are many, that need correction.
Mohn (2002) in his editorial on application of the Somatic Ink Blot Series (SIS) board, appreciated the importance of projective instruments like Thematic Apperception Test (TAT), Robert's Apperception Test (RAT) or Rorschach Psychodiagnostic Plates. He has stated his experience with Somatic Ink Blots (SIB) and observed that at times Rorschach and TAT appeared to be threatening whereas Somatic Inkblot Board is not. Overall diagnostic material obtained by administering SIB is more or less similar to TAT or Rorschach instruments.

The Somatic Inkblot series consists of a single 20cm X 20cm “Foam Core” board with all 62 SIS images printed on it, where each individual image is approximately 3cm X 3cm. The small size of the images are no longer perceived by the subjects as threatening. Case references are available to justify the importance of SIS Board.

The Somatic Inkblot series have drawn the attention of researchers and clinicians in various countries and the test has been adopted in English, Russian and Italian Languages. Cassell and Dubey (2002) added a new dimension to this test by developing a new scoring system. Somatic Inkblot series I is the first test in the series and it always gives emphasis on content analysis for interpretation of the responses. The new scoring system is based on simple indices and this helps researchers and clinicians to find out the changes in pre and post therapeutic intervention.

Cassell’s (2003) work is one of the important additional dimensions in the area of projective technique in general and inkblot technique in specific. He traces the
historical development of inkblot technique, conceptualisation of the somatic inkblot series, psychometric properties of inkblot technique, administration, and scoring and charting. A scientific discussion has also been presented on interpretation and application of SIS responses.

Cassell and Dubey (2002a) brought out the book on Interpreting Inner World Through Somatic Imagery. This book is actually a manual of Somatic Inkblot series video. This book provides information about psychometric properties, reliability, validity, normative data along with clinical indices. The Somatic Inkblot series images have been found useful in assessing certain important areas such as interpersonal relationships, self image, healthy body imagery, team building, feelings on group conformity and utility. Some of the parameters like interpersonal relationships, self image, team building have relevance in career counselling and therefore, Somatic Imagery can be used as one of the exploratory devices for career selection. The SIS test has been used in industries for personality assessment.

Colt, McIntosh and Greenway (2003) contributed a research paper titled "Can color preferences reflect personality characteristics?". This paper is the research output on projective aspects of colour preferences. The subjects of his present study were 57 adult volunteers from general community, 21 male and 36 females, aged between 20 and 60 years. Each subject completed two tasks, the colour gradients test and an adjective checklist. The findings indicated that Color preferences, in terms of their relationship with personality variables, varied according to the attitude, which Subjects took towards specific pairs of colors.
2.3 REVIEW OF LITERATURE ON VOCATIONAL INTERESTS, OCCUPATIONAL PREFERENCES AND CAREER

In this section review of literature related to vocational interest, occupational exploration and career preferences are presented. Individual's interest plays an important role in job selection and in occupational adjustment (Hansen, 1990). The importance of interest in job selection was first fully recognised by educators in the 1990s and after sometime industries also started to give importance on individual's interests in recruitment. Theorists like Parson (1909), hypothesized that occupational adjustment was enhanced if an individual's characteristics and interest matched the requirements of the occupation. Strong Jr. (1943) emphasized the importance of interests for making certain career decisions and he propagated that additional information provided by interests cannot be made available from analysis of abilities and aptitudes.

Interest along with abilities, motives and personality characteristics enable the person to make appropriate career decisions. In career counselling, scores obtained from Interest inventories leads to decisions such as choosing a major, selecting an occupation, decision on mid career change or even preparing for recruitment.

2.3.1 Kuder's Interest Inventory

In the field of measurement of interest, Kuder's interest inventories are well known. Frederic Kuder developed his Personal Preference Record Form-A in
1939. The record included seven almost independent homogenous scales. In Form B (1943) he added two more homogenous scales and in Form C (1948) he added another homogenous scale. The Kuder General Interest Survey (Form E) was brought by Kuder in 1988 and this measures 10 interest areas of Form C. Language of form E is easy to understand. The 10 broad areas covered here are Outdoor, Mechanical, Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service and Clerical.

The test booklet contains 168 forced choice triads. The respondent compares each of the three activities with the other two and ranks them as most preferred (M) and least preferred (L). Kuder originally developed the scales by grouping related items on the basis of content validity. Later on he used item analysis to determine group of items (scales) with high internal consistency.

2.3.2 Thurstone Interest Schedule

Thurstone (1947) a few decades back developed an interest schedule which is popularly known as Thurstone Interest Schedule (1937). The 1947’s version gives a profile of test scores viz. Physical Science (PS), Biological Science (BS), Computational (C), Business (B), Executive (E), Persuasive (P), Linguistic (L), Humanitarian (H), Artistic (A) and Musical (M). Through this checklist a person can systematically clarify his understanding of his vocational interest. This schedule is designed as a counselling instrument to be used in situations which the client-counsellor relationship is such that straight forward and honest expressions of choices can be expected. This can be used for secondary school level and above and with adults out of school.
In Thurstone Interest Schedule (1947) each of the 10 occupational fields is compared twice with each of the other fields and in this manner the ten scores are directly comparable by using paired comparison method. The split-half reliability co-efficient was found to be .90 and above. The validity of each item was investigated to ensure that the items were properly allocated in the 10 fields. In the present study on development of Projective technique Based System for Career Exploration, while presenting two careers at a time in each frame or card, paired comparison method was used.

2.3.3 Super's Theory of Vocational Development

Super (1953) in his theory of vocational development proposed 5 stages of vocational development. These development steps are Growth stage (Birth to 14 years of age), Exploration stage (15 years to 24 years), Establishment stage (25 years to 44 years), Maintenance stage (45 years to 64 years) and Decline stage (65 years and above). It can be assumed that these vocational development stages are relevant to career choices and aspirations. In the given portion of life cycle, the particular developmental stage indicates the vocational behaviour of an individual.

2.3.4 Vocational Preference Inventory

Holland (1985a) developed his Vocational Preference Inventory (VPI) which was based on a series of theoretical and empirical reports. Holland (1959,1966)
formulated his theory of careers taking into consideration two parameters of vocational life and personality. He accumulated a huge data with the VPI as well as data from other interest, personality and value inventories and from the analysis of structure of interests. These formed the base data of the development of his theory.

According to Holland, people can be divided into six types, and in some combination of six types. These six types are Realistic, Artistic, Investigative, Social, Enterprising and Conventional. The type can be organised in the shape of a hexagon in the R-I-A-S-E-C order. Holland's theory has inspired the development of a number of interest inventories and sets of scales to measure his six types, the latest in the series is the Self-Directed Search (Holland, 1985, 1987).

### 2.3.5 Personal Preference Schedule

Edwards (1959) developed an inventory known as Edwards Personal Preference Schedule (EPPS) which is primarily an instrument for the research and counselling. The inventory can provide quick and convenient measures of a number of relatively independent normal personality variables. The items of this tool are in the form of statements that purport to measure manifest needs presented by Murray (1938). The EPPS provides measures of 15 personality variables some of which have closer links with choice of a career viz. Achievement, Affiliation, Endurance, and Order. In addition, EPPS provides a measure of test consistency and measure of profile stability. The tool has got high level of reliability.
2.3.6 Non Language Preference Record

Chatterji (1960) developed a non-verbal interest inventory, popularly known as Chatterji's Non-language Preference Record (CPR) Form 962. This inventory helps to identify educational and vocational field of training by appraising ten broad interest areas, viz. Fine Arts, Literary, Scientific, Agricultural, Technical (Mechanical), Crafts, Outdoor, Sports and Household.

About 500 pictures of various activities were prepared by using stick figures. Approximately 350 were used with first tridisc form of the inventory. The experimental version was administered to more than 800 boys reading in the top most class of their school career in Calcutta, Patna, Allahabad, Agra, Bombay, Sholapur and Ranchi. The final version contains 150 picture sets, each set containing three small stick figures depicting some educational or vocational activities. The inventory has been found to discriminate between Arts and Science students on the relevant scale. This inventory has positive correlation with Kuder Preference Record (1951). The most important difference between the CPR and KFR lies in the fact that, in KPR there are many items which refer to the person's interests in appreciation rather than active participation whereas all the CPR items identify a person's interest in terms of active participation in the activity.

In CPR, the stick figure activity oriented items were used which are not fully structured. Certain items, for instance item numbers 14, 21, 39, 106, 136 etc. are fully unstructured situations. The item like 106(A) is similar to one of the TAT
cards (Card No.4) of Atkinson's (1958) Test of Imagery. Thus it can be inferred that CPR has some similarities of TAT like projective tests and can be considered as semi projective test.

2.3.7 Ohio Vocational Interest Survey

The first edition of Ohio Vocational Interest Survey (OVIS-I), was brought out by D'Costa, Winefordner, Odgers and Koons (1969). OVIS-I can be used for young people, especially those in grade 7 through 12. The homogenous OVIS-I interest scales were developed on the basis of data-people-things model of the Dictionary of Occupational Titles (1965). After initial rational clustering of related items, a series of factor analysis were done to refine the item pool and finally the number of items came out to be 280.

The OVIS-II (Winefordner, 1981) contains 253 items, about one fourth of which was derived from the OVIS-I. As the OVIS-I and OVIS-II clusters are based on different classification schemes, the equivalence between the two sets is not exact. The OVIS-II Profile provides percentile ranks for both females and males of three grade groups. These grade groups are grades 7 through 9; grades 10 through 12; and grades 13 through 14. The instrument can be scored through machine also.
2.3.8 Career Maturity Inventory

The correspondence between vocational behaviour and the expected behaviour for the age period is generally termed as vocational maturity or in a limited sense as Career Maturity. Crites (1973) developed the Career Maturity Inventory (CMI) which provides scores for Vocational Maturity, Attitude, Self knowledge or Vocational Competence, Choosing a Job, Problem Solving, Occupational Information and Looking Ahead. Psychometric data obtained by administering this inventory appears to demonstrate the expected properties most of the time. Interestingly, the Vocational Competence portion is well constructed. However, this inventory also suffers some limitations. In the words of Crites (1973) in a particular testing situation, scores suggest that 12th grades are less vocationally mature than 11th grades. This is not consistent with the usual notion that students should become more vocationally mature with age.

2.3.9 Strong Vocational Interest Blank

Strong Jr and Campbell (1974) brought out Strong Campbell Interest Inventory which is the merged form of the Strong Vocational Interest Blank (SVIB). This inventory helps the subject to understand his/her work interest. The test items consist of list of many jobs, activities, school subjects and so forth. The entire inventory consists of several parts viz. Occupations, School Subjects, Activities, Amusements, People, Preference between two Activities and Your Characteristics. The subject is asked to show his/her liking or disliking for each. The answers are compared with the answers given by the people already
working in a wide range of jobs. Scores are compared with respect to similarities of interests.

The latest version of the SVIB is the Strong Interest Inventory (Hansen and Campbell, 1985) where six equalization process has been taken care of. One major additional change which has been incorporated in 1985 version is the inclusion of more non professional and vocational/technical occupational scales. Thirty two percent of the occupational scales now represent occupations with educational requirements less than a college degree. Effort has been made to increase the utility of the inventory. Microcomputer software for interactive test administration is another one additional feature of the 1985’s revision.

2.3.10 Career Assessment Inventory

Johansson (1975) and Johansson & Johansson (1978) brought out the first edition of the Carrer Assessment Inventory (CAI) which can be used by individuals who desire immediate career entry, pursue community college education or want to undergo vocational-technical training. The modified version of CAI was published in 1986 (Johansson, 1986) with the inclusion of more occupational scales representing professional occupations.

The expanded CAI test booklet includes 370 items and the profile. This profile like Strong profile reports three sets of scales. The CAI also hired Holland’s theory to organise the Basic Interest Areas and Occupational Scales on the profile, clustering together those that represent each of the Holland’s six types. The General Themes and Basic Interest areas are normal on a combined six
reference sample drawn from the six Holland Interest areas. The Occupational Scales of the expanded version of the CAI were developed by using the empirical method of contrast samples employed with the Strong Interest Inventory.

2.3.11 Vocational Interest Inventory

Lunneborg’s (1976,1981) Vocational Interest Inventory (VII) is similar to JVIS on several dimensions which can be used for young people. The eight homogenous scales of the Vocational Interest Inventory(VII) were constructed to represent eight groups in accordance with Roe’s theory of occupational classifications; Service, Business Contact, Organisation, Technical, Outdoor, Science, General Culture, Arts and Entertainment. The scales were constructed using a series of factor analysis that reduced the initial item pool to the final 112 forced choice items. The norms of the scales were developed on a combined sex sample of students.

Jackson (1977) developed Jackson Vocational Interest Survey which can be used for high school, college students and adults who need assistance in educational and career planning. The inventory contains 289 forced choice items describing occupational activities.

The hand scored JVIS profile includes only the 34 Basic Interest Scales; the machine scored profile also include 10 general occupational themes measuring broad patterns of interests that reflects the subject’s orientation towards work, 17 broad cluster of university major fields and 32 occupational clusters. Development of the 34 homogenous Basic Interest Scales based on a theory
based technique of scale construction. The 10 General Occupational Themes later were constructed through the factor analysis of 34 Basic scales. Standard score norms of JVIS is available.

2.3.12 Occupational Aspiration Scale

Grewal (1975) brought out Occupational Aspiration Scale intended to measure the interest of a subject in different kind of jobs. The present scale is the adapted prestige rating version of 150 occupational titles of National Opinion Research Centre (NORC, 1947) list. The titles of the present scale were taken from the Dictionary of Occupational Titles of India. This number was reduced to 108 by a panel of judges engaged in different occupations. The final scale consists of 80 occupations out of 108 occupations with different prestige values. The items were arranged in mixed order in eight multiple choice items. The Percentile norm is available for the present scale.

2.3.13 Vocational Preference Inventory

Balakrishnan (1979) contributed the Vocational Preference Inventory (VPI) which can measure Holland's Six occupational personality dimensions as well as the response set variable "Acquiescence". The inventory can be used for high school, college, professional colleges, University students as well as adults of both sexes. This is a semi projective inventory as envisaged by Balakrishnan (1979). The underlying rational is that for each item the subject reacts on the basis of his strong feelings and attitude on many kinds of occupations. He is
asked to put tick mark on “Yes” if the occupation appeals to him or her, i.e. if he or she is interested. If the subject feels uninterested in the occupation he or she makes a tick mark on “No”. The inventory can be self administered by the examiner on an individual or as a group. The inventory covers the six occupational personality dimensions namely Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C) as propounded by Holland (1973) as well as the acquiescence response set. Following Holland (1973) it was assumed that the interest inventory is a personality inventory. The VPI contains 120 occupational titles of which 20 items of each relate to R,I,A,S,E and C Dimensions as well as 10 imaginary occupational titles as formulated by the author. This imaginary occupational titles were formulated to conform to the criteria set formed by Wiggins (1973) to assess the acquiescence disposition. The split half reliability coefficient and, content and concurrent validity data are available for the present inventory.

The VPI is one of the very few important semi projective devices which can measure occupational personality dimensions which has direct bearing with the present investigation. The emergence of Vocational Preference Inventory (VPI) was based on a series of theoretical and empirical reports. The available current version of the VPI (Holland, 1985a) has seven homogenous scales. This was constructed in a series of rational empirical steps that measures Self-Control along with six types hypothesized in Holland's theory. The profile on this scale is calibrated to provide standard scores based on either 378 female or 354 male college students and employed adults to provide comparisons across scales.
2.3.14 Self Directed Search

The self directed Search (Holland, 1985, 1987) is similar to VPI is intended to measure Holland's six types. It can be self administered and self scored and to a limited extent it can be self interpreted. The test booklet contains 228 items distributed over 4 sections; Activities the subject would like to do, Competencies, Occupations, and Self Estimate. The most important feature of the Self-Directed Search (SDS) profile is the summary code. The SDS and VPI have moderately high reliability levels and the predictive validity indices were also calculated with the range from 35% to 66% accuracy.

2.3.15 Occupational Preference Scale

Umapathy and Paul (1997) brought out Occupational Preference Scale for the measure of occupational interest of students. The scale can be used for all levels of students above 10 years. This scale is generally used in vocational guidance for the assessment of occupational preferences and career orientation of students. This scale contains 176 titles of occupations classified into thirty groups based on International Standard Classification of Occupations, Titles and Codes (1972) published by the International Labour Office, Geneva. The preference for each occupation is indicated on a seven point rating scale with the description ranging from “dislike very much” to “like very much” with a neutral preference point at the centre. In section XII of the scale, item number 76 talks on occupation of Computer Engineer. The scale was developed with reference to the study by Paul (1988). The test-retest reliability index of the Occupational
Preference Scale was obtained for a group of 30 high school students. For validity data, a significant group difference was noticed in the mean ratings given for occupations by younger (8th Standard) and older (10th standard) High school students, boys and girls and students with different socioeconomic status and background.

2.3.16 Interest Inventory for Girls

Sodhi and Bhatnagar (1997) developed an instrument for girl students known as Sodhi and Bhatnagar Interest Inventory (SBII) for girls. This inventory can be used to find out the interest i.e., the vocational interest of girls in India. The SBII consists of 136 items both in English and in Hindi Languages simultaneously. The inventory is divided into 11 interest areas and the items are divided amongst them. The reliability index, content and criterion validity data are also available for this inventory.

2.3.17 Vocational Interest Record

Kulshrestha (1977) published Vocational Interest Record (VIR) which can be used as an aid to students to help them to adjust themselves to the careers or jobs or vocations by making wise choices. The VIR measures vocational interests, to enable the pupils to select such subjects in schools which are according to their preferred vocations. The VIR can be used for higher secondary students, college students and young adults.
The VIR contains 200 vocations belonging to 10 different vocational interest areas. These include Literary, Scientific, Executive, Commercial, Constructive, Artistic, Agriculture, Persuasive, Social, and Household. Each of these 10 areas has 20 jobs or vocations or assignments on the record, 10 in horizontal and 10 in vertical side. This has much similarity with Thurstone Interest Schedule. The VIR has got the test-retest reliability coefficient of .69 with a time interval of 15 days and for establishing validity initially, highly valid items were selected from Thurstone's Interest Schedule, Strong Vocational Interest Blank, and Kuder's Preference Record Form C.

2.3.18 Educational Interest Record

Kulshrestha (1977) published another one test titled Educational Interest Record (EIR). This interest record can be administered on students undergoing graduate and post graduate courses.

The EIR contains 98 educational subjects and activities belonging to 7 different educational interest areas. The test-retest reliability coefficient of the test found to be .76 with a time interval of 15 days and the coefficient of validity was found to be .78 when this record was validated with Labh Singh's Educational Interest Inventory.
Information Technology industries in India and abroad develop their own tests and inventories for the recruitment of IT professionals specific to their enterprise. These tests and inventories have relevance with career exploration in IT. But the IT and computer industries do not share these information with others and maintain them as highly confidential documents. Therefore, these tests and inventories are not available in published form.

However in India, NIIT has produced several volumes in 1998, under the heading of Career Development Services related to IT industries. The volumes on Personality Assessment contains several tests which might be used by computer industries for the recruitment of their employees. The Personality Test I contains a number of items on 'Project your personality Traits'. The Personality test II is on "Identify your personality types" which has got four sections. The Personality test III is on "Introduction to self perception". In test II there are 80 items on "How Assertive am I" for which responses are to be given either in "yes" or in "No". The personality test IV is the reproduction of Keirsey's Temperament Sorter. Undoubtedly these tests are not projective tests but these give some ideas how IT industry people use psychological tests and inventories for the recruitment of their employees. The Personality Test IV helps the IT personnel to explore their personality profile. Sixteen types of personality profiles can be drawn on the basis of this test and the characteristic behaviour traits can be
known to the persons. Examples of great personalities are also available with respect to each profile.

2.4 SUMMARY OF REVIEW OF RELATED LITERATURE

The review of literature clearly indicates that no study as such has been conducted on Projective Technique Based System For Career Exploration In Information Technology. Although a number of studies have been conducted on projective techniques and as a result a good number of projective techniques were developed but review of literature highlights that many more specific tools need to be developed to meet the growing needs of various sectors.

Panek (2001) has summarised the immense importance and need for use of projective technique in the new millenium by way of developing tools in applied settings, such as prediction of behaviour, industrial selection, personality assessment and the like.

The present review strengthened the need for developing Projective Technique Based Career Exploration System and formulation of suitable research designs to carry out the present work in a scientific way. Further the detailed review of the literature paved the way towards establishing the reliability and validity of the instrument as these two characteristics always remain controversial with respect to projective techniques (Aronow, Reznikoff, and Moreland, 1995, Blatt, 1990).

In the succeeding paragraphs, the salient points brought out by the literature review are presented.
1. In the high technology era, the usual vocational interest inventories or occupational preference schedules which were developed on psychometric principles are not adequate enough to assist the individual in career exploration as they measure part of overt behaviour such as interest.

2. A good number of techniques and tools are available on assessment of vocational interest, career preference, and occupational choices. A review of these studies help us to understand the limitations of these tools and at the same time they serve as the basis of the present study to certain extent. For instance Thurstone Interest Schedule (1947) has used paired comparison method in the presentation of test items for vocational exploration.

3. Limited attempts have been made to develop semi projective type of devices for identification of educational and vocational fields, for instance the work of Chatterji (1960) and Balakrishnan (1979). These 2 studies visa vis tools have some bearing on the present investigation.

4. In absence of a suitable career exploration device, the high technology industries in India and abroad mostly use personality tests for their recruitment and career promotion scheme. Holland’s (1973) theory of personality types in relation to career choices is one of the historical contributions which paved the way for development of vocational inventories.
5. Use of Computers in scoring and interpretation of interest inventories have been tried out in a limited way (Holland, 1985; 1987). In the era of high technology, application of computer is becoming more popular and relevant.

6. The discovery of psychoanalysis by Freud (1894) became the basis of all projective techniques. Projective techniques are based on the phenomenon of projection. Jung's (1910) utilisation of free association method contributed to finalise projective techniques and Rorschach (1942) was instrumental in developing projective technique into a highly scientific method. Projective tests give access to the deeper levels of personality and in that respect they are superior to psychometric inventories or rating scales. A good number of projective tests are available to unfold various personality dimensions of an individual.

7. Verma (2000) after extensive research on projective devices has thrown light on certain misconceptions about projective techniques in general and inkblot in particular. According to him, it should not make any difference when we call a projective test as a projective technique or vice versa. Both are standardised ways of comparing the behaviour of two or more persons or groups at any given time.

8. The more unstructured the situation, the better the chances are there for the subject to project. The common unstructured or semi structured objects used in projective tests are vague and ambiguous pictures, inkblots, incomplete sentences, some model clay, paper and figure paints, haphazard lines, somatic inkblots etc. Some of the important projective tests are – Rorschach,
Thematic Apperception Test, Senior Apperception Test, Make a Picture story, Children Apperception, Sentence Completion, Drawing completion, Rosenzweig Picture Frustration, Drawing of Human Figure, Story Telling and Completion, Cassell's Somatic Inkblot series etc.

9. Atkinson (1958) has developed a standard six picture Thematic Apperception Test, popularly known as Test of Imagination. This is considered to be a standard procedure to find out human motives. All the six picture cards depict unstructured situations. The purpose of this test is to help the individual to identify the motivational themes he or she expressed in the TAT stories and thus to help the individual unearth his/her motive pattern and dominant motive. The Test of Imagination takes care of primary social motives as well as other motives present in the story along with the other major concerns and interests. The Test of Imagination to some extent can help in career selection. The present study on Projective Technique based System for Career Exploration shares the same underlying rationale as that of Test of Imagination.