Chapter 2
LITERATURE REVIEW

2.1 CHAPTER OVERVIEW

An extensive review of literature has been undertaken for the purpose of this research that spans across the broader concept of employability and further narrows down to its relevance in Indian Information Technology Sector. A conceptual appraisal of the definitions reiterates the fact that employability is a complex and multidimensional construct. Therefore, the subsequent sections explore the origin and the significant models and frameworks of employability, in order to delineate its various dimensions. Further, based on expectations and perceptions of employers, various antecedents of generic employability have been identified. Also, the current skill landscape in India is discussed in order to understand the present scenario of qualitative demands of the industry and supply of human resource in the country. The role of higher education in building graduate employability has also been examined.

As the present study focusses on assessment of employability in the context of Information Technology sector, some sections of this chapter are focused explicitly on this sector. They aim to provide an overview of the Information Technology sector in India and understand the present scenario of talent supply and demand. Further, the predictors of employability specifically in context of the Information Technology sector have been identified to underline the domain specific requirements. Also, the studies on stakeholders’ perspectives with respect to employability have been pursued. At the end, the key learnings from this literature review are summarized and the research gaps have been identified.

2.2 UNDERSTANDING THE CONCEPT OF EMPLOYABILITY

A conceptual review of the extensive body of employability literature that has been undertaken, suggests that employability cannot be defined with a singular approach. Over the last decade, employability has been defined from a wide array of perspectives, ranging from a concept, process to a product. Heyler (2007) concludes that employability is evidently a multifarious mixture of elements. These elements differ with the jobs, however, these yield the same end result i.e. they transform a
person to a useful and more desirable employee. The study emphasizes that employability skills need to be honed by employees and students of all ages, not just by the undergraduates.

Exploring the concept of employability from different perspectives, several definitions have been put forward to delineate it. Hillage and Pollard (1998) define employability as the “ability to get initial employment, maintain employment and obtain new employment if required”. However, Fugate et al (2004) bring out that employability in no way guarantees actual employment adaptability in context of work and careers. Nevertheless, employability increases the chance of getting a job and hence contributes to enhancing an individual’s likelihood of gaining employment.

Although employability has a much wider meaning, it is often considered synonymous with skills. Robinson (2000) consider employability as a fundamental set of skills that is essential for securing, keeping and doing well on a job. However, a complementary opinion considers it not only as skills but an assimilation of knowledge, skills and abilities coupled with an ability to demonstrate them.

Harvey (2001) defines employability in a narrowed down subject – employability of higher education institutions’ graduates. It highlights that employability is not a set of skills, rather it is an array of experiences and attributes that are developed through higher-level learning. Therefore, it concludes that employability is not a product but a process of learning. A similar viewpoint considers employability as “the willingness to be and to remain attractive in the labor market” (Sanders and Grip, 2004; Rothwell and Arnold, 2007). Employability has been emphasized as lifelong learning by Heijde and Van Der Heijden (2006) who define this concept as “the process of continuously fulfilling, acquiring or creating of work through the optimal use of competencies”.

Furthermore, the concept of employability can be explored from two different dimensions i.e. perceived and objective employability. Bernston (2008) conclude that objective employability is the actual employability that refers to an absolute level of employability for an individual. On the other hand, perceived employability refers to individual’s believed level of employability. While absolute employability defines employability in concrete terms, the perceived employability is more alleged in
nature. With a different approach, Fugate and Kinicki (2008) brought out a much broader concept and presented the dispositional perspective of employability. The perspective depicts that “employability is a constellation of individual differences that predispose individuals to proactive adaptability specific to work and careers”.

The key definitions of employability that have been put forward by various research studies are summarized in Table 2.1.

**Table 2.1: Key Definitions of Employability**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Author</th>
<th>Employability Definition</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Bridgstock (2009)</td>
<td>Adequate preparation for moving into jobs and maintaining employability once there, involves not only general and discipline specific skills but also a range of skills to manage oneself and his career.</td>
</tr>
<tr>
<td>2</td>
<td>Fugate and Kiniki (2008)</td>
<td>A constellation of individual differences that predispose employees to (pro)actively adapt to their work and career environments</td>
</tr>
<tr>
<td>3</td>
<td>Pool and Sewell (2007)</td>
<td>Employability is having a set of skills, knowledge, understanding and personal attributes that make a person more likely to choose and secure a occupations in which they can be successful</td>
</tr>
<tr>
<td>4</td>
<td>Heijde and Van der Heijden (2006)</td>
<td>The continuous fulfilling, creating or acquiring of work through the optimal use of competencies</td>
</tr>
<tr>
<td>5</td>
<td>Sanders and Grip (2004)</td>
<td>The willingness to be and remain attractive in the labor market.</td>
</tr>
<tr>
<td>6</td>
<td>Fugate, Kiniki and Ashford, (2004)</td>
<td>A psychological construct that embodies individual characteristics that foster adaptive cognition, behavior and affect, and enhance the individual work interface</td>
</tr>
<tr>
<td>8</td>
<td>Hillage and Pollard (1998)</td>
<td>Ability to get initial employment, maintain employment and obtain new employment if required.</td>
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</table>

It can be concluded from the table above that employability is a broad construct that relates to the possession of skills, knowledge and qualities. These attributes in turn enable an individual to secure and maintain his job and move within jobs for career progression.
2.2.1 Graduate Employability

Employability can be analyzed from different perspectives for those who are seeking jobs and those who are already on the job. With its relevance for potential fresher job seekers, the term “graduate employability” has become prevalent. The term “Graduates” basically implies higher education alumni and is more often used in context of students graduating from higher education institutions who are fresher job seekers. Graduate employability is often referred to as the possession of specific skills and attitudes and their ability to utilize them for job search and further retaining these jobs (Nabi, 2003). Graduate Employability means that higher education alumni have developed the capacity to obtain and/or create work (Kinash, Crane, Judd et al., 2015).

It was believed in the earlier times that high academic grades or percentage of marks would ensure a highly rewarding employment. Therefore, the teaching and learning methodologies were centred around theoretical studies and academic excellence. However, in the recent years, the world of work has witnessed enormous changes with globalization, internationalization, soaring competition and technological innovations. Keeping with the pace, the changing demands of the job market have brought out the need for soft skills, attitude and those personal qualities that complement the hard skills or the theoretical knowledge of the graduates. Therefore, it has become much evident that the hard skills alone do not suffice to remain attractive in the job market. Personal qualities and “Soft skills” often termed as generic skills or transferable skills are equally essential to complement the acquired hard skills.

Considering these comprehensive gamut of perspectives discussed in the preceding sections, it is rather difficult to provide an explicit meaning to the employability construct. The intricate construct can be explored from the viewpoint of individual characteristics, the context under consideration or the mere effect of employability.

Although there are evident disparities in the meaning of employability, it can be concluded on a broad spectrum that employability implies a manifestation of knowledge, skills, abilities and characteristics vital for a job. While the hard skills
refer to the technical and discipline specific knowledge, the soft skills and personal qualities provide the ability to demonstrate them. Employability is a more complex concept than those of ‘core’ or ‘key’ skills. It is linked with a range of discourses and encompasses both theoretical intelligence and practical aptitude.

2.2.2 Origin and Evolution of Employability

The concept of employability has substantially changed over the years. The presently accepted definitions have developed over a number of years transiting from one stage to the other. The extensive work of Gazier (1999) in the area of evolution of employability brings out the historical development of employability through seven operational versions. These are listed below:

a) **Dichotomic Employability**: This concept emerged in 20th century in UK and US. It considered employability as dichotomic with two dimensions. These two dimensions or extremes were “employable” and “unemployable”. Employables referred to those who were actively seeking jobs and unemployables referred to those who were unable to work e.g. elderly people in need of relief.

b) **Socio Medical Employability**: –The concept of socio medical employability emerged in 1950s. It referred to the work abilities of socially, physically or mentally disadvantaged people and the work requirements.

c) **Manpower Policy Employability**— Developed in the 1960s, this concept was an extension of socio medical employability. It focused on the ability of an individual to become employed. It was concerned with key characteristics like knowledge, attitude and skills of disadvantaged individuals.

d) **Flow Employability**: The concept emerged in the 1960s with a focus on the demand side and the accessibility of employability within the local and national economies. It defined employability as “the objective expectation, or more or less high probability, that a person looking for a job can have of finding one”.

e) **Labour Market Performance Employability**—Used internationally since the end of the 1970s, this approach underlined the labor market results measurable in terms of days employed, hours worked and payment rates.
f) *Initiative Employability* — This concept emerged in the North American and European human resource development (HRD) literature of the late 1980s. It emphasized that successful career development requires the development of skills that are transferable and the flexibility to move between job roles. The key focus of initiative employability was on skills and abilities of the individuals.

g) *Interactive Employability* — This approach incorporated policy makers, employers and individuals as mutual stakeholders in employability. It claimed that the employability of an individual is somewhat relative to the employability of other stakeholders in the labor market.

Therefore, it is evident from the above discussion that there has been a prevalent contention on the concept of the employability over the years. The concept of employability has developed through different stages with changing times and conditions. However, by the late twentieth century, employability had gained a dominant position for human resource development.

### 2.2.3 Models and Frameworks of Employability

A wide range of models and frameworks of employability have been proposed over the years. These comprehensive models examine employability from different perspectives, thereby providing it a concrete meaning, suggesting definitions and attributes or indicators of the construct. These models and frameworks translate the theoretical construct of employability into measurable variables. Some of the significant models have been reviewed as follows.

*The Four Components of Employability*

Hillage and Pollard (1998) developed the four components model of employability. As the name suggests, the model concluded that employability consists of four main components that comprise of asset, deployment, presentation and context of personal circumstances and labor market. These are described below:

- *Asset* implies the knowledge, skills and attitudes of a person.
Deployment consist of career management and life skills, job search skills and having a strategic approach towards the labor market.

Presentation means the ability to demonstrate ‘employability’ assets and present them to the market in an accessible way.

Ability to actualize ‘employability’ assets depends on the individual’s personal and external circumstances and the inter-relationship between the two.

It can be observed from the model that employability is considered as the knowledge, skills and attitudes coupled with the ability to demonstrate them. Further, the employability of an individual may be affected by the personal and contextual factors.

**Defining Employability Skills: Eight Dimensions of Employability Skills**

Australian Chamber of Commerce and Industry and Business Council of Australia (2002) provides a broader meaning to employability. It defines employability skills as “skills not only to gain employment but also to progress within an enterprise so as to achieve one’s potential and contribute successfully to enterprise strategic directions”. This framework identifies eight skills that are significant to an individual’s employability. These include Communication skills, Team work, Problem solving skills, Initiative and enterprise skills, Planning and organizing skills, Self-management skills, Learning skills and Technology skills.

**Mayer Key Competency Framework**

Key Competencies focus on the capacity to apply knowledge and skills in an integrated way in work situations. Mayer (1992) discovered seven key competencies which people should attain before they move into the workforce. These are collecting, analyzing and organizing information, communicating ideas and information, planning and organizing activities, working with others in teams, solving problems, using mathematical ideas and techniques and using technology.
The USEM Model of Employability

Knight and Yorke (2002) discovered the USEM model of employability that depicts what a graduate should obtain from a degree course which is necessary in the world of work. The USEM is an acronym that represents the four inter-linking and inter-dependent areas of: Understanding, Skills, Efficacy and Meta-cognition. These are described below:

- “Understanding” includes subject specific knowledge and applicability
- “Skills” refer to subject and general abilities,
- “Efficacy” implies beliefs of the student’s own qualities and
- “Metacognition” refers to the ability to reflect on and regulate one’s own learning and behavior.

The USEM model provides an outline on how to embed employability into the curriculum. It acknowledges that the needs of students, employers and other stakeholders must be taken into account.

The Career Edge: Key to Employability Model

The Career EDGE model postulated by Pool and Sewell (2007) depicts a holistic approach to curriculum design. This model is grounded on the definition that “Employability is a set of having skills, knowledge, understanding and personal attributes that make a person more likely to choose and secure occupations in which they can be satisfied and successful”. Accordingly, individual facets focused by the model allow students to adapt to the new world of work, and provides them enhanced prospects for career success and satisfaction. The model consists of five dimensions that are listed as follows:

- degree subject knowledge, skills and understanding
- generic skills
- emotional intelligence
- career development learning i.e. becoming more self-aware of their interests by for example identifying job opportunities, developing interview skills,
- work and life experience.
The model implies that the development of these components will result in the increased levels of self-efficacy, self-confidence and self-esteem. These three factors are believed to significantly impact the employability of individuals.

**The Magic Bullet Model of Employability**

Harvey (2002) discovered the Magic Bullet Model of employability. It brings out that students are somehow given employability as a result of their having been a student, which leads them to being employed. The higher education institutions provide employment development opportunities. The gaining of degree makes one employable and hence offers employment.

Harvey (2002) further developed another model considering other employability factors. The author highlighted the importance of three main parties i.e. graduates, higher education institutions and employers in developing graduate employability. It pointed that graduates need to engage with the employability development opportunities provided by higher education institutions and utilize their extracurricular experiences to enhance their skills. The model presented three core processes that have an impact on employability:

- Pedagogic process that encourages development,
- Self-reflection by the student
- The articulation of experiences and abilities.

The model also underlined that employability development opportunities are affected by the subject discipline of the graduate. Some discipline areas are more active in fostering and developing employability than others.

**The Bridgstock Conceptual Model of Graduate Attributes For Employability**

Bridgstock (2009) established a model that examines the attributes of graduates that enhance their employability. These include career building skills, self-management skills, generic skills, discipline specific skills, employability skills and the underpinning traits and dispositions of the individual. These are described below:
Career Management Skills: These are the skills necessary to scan and advance in the world of work.

Self-Management Skills: This implies knowledge and evaluation of oneself and includes factors like values, interests, aptitude etc.

Discipline specific skills: These refer to subject and domain specific skills that are needed due to one’s nature of job.

Generic Skills: Also known as transferable skills, these are the skills that can be transferred to different work situations. Eg communication skills, teamwork.

Underpinning traits and dispositions: These refer to the characteristics that lead to the advancement of career management skills.

Heijde and Van der Haijden’s Competency Based Model of Employability

Heijde and Van der Haijden (2006) developed a measure of employability applicable to both job related matters and career development. The dimensions of the model are based on individual competencies. These comprise of the following:

- Occupational expertise i.e. knowledge and skills specific to a particular professional domain;
- Anticipation and optimization that refers to the creative and customized preparation for work changes;
- Personal flexibility referring to the changes in the work environment;
- Corporate sense that relates to various occupational work teams and virtual networks that the employee belongs to;
- Balance that refers to compromising between the conflicting employer’s interest and one’s own personal and career related interests.

McQuaid and Lindsay Model of Employability

McQuaid and Lindsay (2005) evolved a comprehensive framework of employability. The framework includes three broad components of employability— individual factors, personal circumstances and external factors. These are described below:
Individual factors include employability skills and attributes, demographic characteristics, health and well being, job seeking, adaptability and mobility.

Personal circumstances comprise of household circumstances, work culture and access to resources.

External factors comprise of demand factors like labor market factors and enabling support factors like policy factors.

The model emphasizes that all these factors are crucial to the concept of employability as it relates to ability to move into or within jobs. Therefore, employability is a concept that moves beyond just the skills and attitudes demanded by the employer.

**Fugate, Kiniki and Ashford’s Model of Employability**

Fugate et al. (2004) define employability as “psycho social construct that represents individual characteristics which promote adaptive cognition, affect and behavior and help individuals to recognize and leverage career opportunities”. This implies that employability enables an individual to move between jobs both within and between firms. This model, however, underlines the fact that although employability does not confirm employment, it improves the possibility of gaining employment. Therefore, according to this model, employability is regarded as type of work specific active adaptability that consists of three dimensions. These include personal adaptability, career identity and social and human capital. These are elaborated below:

- **Personal adaptability** implies flexibility and ease of response to environmental changes. It refers to the capability, willingness and competence to change.
- **Career identity** refers to how individuals define themselves in a certain job context. This includes role identity, career identity and organizational identity of an individual.
- **Social and human capital** implies personal variables that can affect an individual’s career advancement. These may include age, education, work experience and allied areas.
Fugate and Kinicki’s Dispositional Model of Employability

The concept of dispositional employability was brought out by Fugate and Kinicki (2008) is described as a “constellation of individual differences that predispose individuals to (pro)active adaptability specific to work and careers”. The dispositional employability consist of the following dimensions:

- **Work and Career Resilience**: Resilient individuals possess a positive and optimistic view. They are confident to deal with challenges of workplace, career and life.
- **Openness to changes at work**: This dimension implies flexibility, emphasizing that the people who are open to change are more likely to be adaptable.
- **Work and career proactivity**: This aspect refers to the proactive behavior of individuals to purposely search information about job and potential career opportunities seeking advancement in the chosen profession.
- **Career Motivation**: Individuals with career motivation possess a high degree of persistence and drive to achieve the desired objectives.
- **Work Identity**: It refers to how individual views himself in the work environment.

It is quite evident from the analysis of the above models that employability can be explored from different standpoints in different perspectives. Further building on Table 2.1, the comparative analysis depicted in Table 2.2 highlights how these noteworthy models differ in their emphasis and subsequently in the proposed definitions and attributes of employability.
## Table 2.2: Summary of Key Employability Models

<table>
<thead>
<tr>
<th>Employability Model</th>
<th>Employability Definition</th>
<th>Employability Attributes</th>
<th>Model Emphasis</th>
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<td>Bridgstock (2009)</td>
<td>Adequate preparation for moving into jobs and maintaining employability once there, involves not only general and discipline specific skills but also a range of skills to manage oneself and his career.</td>
<td>o Career management, o Self-management, o Career building skills o Generic skills, o Discipline specific skills, o Employability skills, o Underpinning traits and Dispositions</td>
<td>Individual attributes</td>
</tr>
<tr>
<td>Fugate and Kiniki, (2008)</td>
<td>A constellation of individual differences that predispose employees to (pro)actively adapt to their work and career environments</td>
<td>o Work and Career Resilience, o Openness to changes at work, o Work and career proactivity, o Career motivation, Work and Career Identity</td>
<td>Individual Dispositions</td>
</tr>
<tr>
<td>Pool and Sewell, (2007)</td>
<td>Employability is having a set of skills, knowledge, understanding and personal attributes that make a person more likely to choose and secure a occupations in which they can be successful</td>
<td>o Degree subject knowledge, o Experience and skills, o Generic Skills, o Emotional Intelligence, o Career Development Learning, o Work and Life experience</td>
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<td>Heijde and Van der Heijden (2006)</td>
<td>The continuous fulfilling, creating or acquiring of work through the optimal use of competencies</td>
<td>o Occupational Expertise, o Anticipation and optimization, o Personal flexibility, o Corporate sense o Balance</td>
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<td>Fugate et al (2004)</td>
<td>A psychological construct that embodies individual characteristics that foster adaptive cognition, behavior and affect, and enhance the individual work interface</td>
<td>o Personal Adaptability, o Career Identity, o Social and Human Capital</td>
<td>Individual Characteristics</td>
</tr>
</tbody>
</table>

It can be inferred from the table above that there is no singular definition or precise and definite attributes that describe employability. The approach towards scanning and investigating employability depends on how it is perceived and what attributes are considered substantial in the context.
2.3 EMPLOYABILITY SKILLS: PERCEPTIONS AND EXPECTATIONS

It has been observed that the expectations of the employers from the potential job seekers is rising and constantly changing with the changing job markets. Literature review reveals the varied demands and expectations of the employers from the potential job seekers while hiring them. It also brings out their perception towards employability and the way they comprehend it. In view of the same, this section highlights the perspectives of the employers towards employability.

2.3.1 The Demand for Skills

The expectation of the employers while hiring has stretched much beyond a fundamental and well identified skill set. This section highlights the skill demands of the employers from the potential job seekers.

Khosla (2011) infers that according to recruiters, the job seekers are at times theoretically ready rather than being industry ready. However, the employers are looking beyond knowledge in job seekers. They seek skills like functioning with passion, ambition and go getter attitude. The study brought out that the largest satisfaction gaps in capabilities of new graduates were found in the areas of soft skills and employee attitude. Various skills across all levels required by employers have been found to be in deficit. Dupre and Williams (2011) concluded that a wide range of skills are considered as significant by the employers in potential employees. These include basic skills, followed by basic work skills, social skills, personal traits, and higher order thinking skills. Employers lay heavy emphasis on communication skills, analytical skills, teamwork skills, technical skills, and work ethic. Luecking (2010) has also emphasized the importance of skills for a recruiter. However, finding graduates with these requisite skills is a challenge for majority of employers. Workforce Development Boards of North California (2013) brought out that communication and interpersonal skills, critical and analytical thinking, problem solving represents a primary gap in the area of soft skills for job. Businesses indicated that improved soft skills and personal effectiveness training would be valuable followed by occupational skills training. Although the trainings are provided by the companies and imparted at the college level, employers believe there is a strong need for standardized work readiness skills training and certification.
Zaharim et al.,(2009) brings out the employers’ perception and expectation of engineering graduates. It revealed that in addition to the application of mathematics and the sciences as core engineering subjects, engineering curricula should emphasize on the humanistic aspects of problem solving or project implementation. Also, in order to make the students work ready, the need to outdo in soft skills must be further emphasized. In regard to recruitment of technical graduates, Shannon (2012) infers that the technical knowledge is a more important graduate attribute in recruitment than the design knowledge. Employers also consider employability skills like aptitudes or personality characteristics to be significant. However, often, these are difficult to pre-judge in a graduate. Apart from these, the employers openness, willing to learn and intellectual capability in candidates are the sought after skills. In line with the same, Rao (2013) argues that managers with both hard and soft skills are more employable and hence progress in their careers. However, SHRM (2008) survey report suggests that employers often feel workforce readiness deficiencies as talent shortages.

2.3.2 Employability – The Recent Perspectives

The literature review reveals the wide ranging perspectives of employers on the subject of employability. It has been explored through a number of different standpoints and therefore, employability can be examined and interpreted from diverse angles. The present section throws light on these perspectives.

Employability can be explored from emotional and psychological perspective. Hogan et al (2013) concluded although the economic factors are often considered as the primary reasons behind unemployment, but psychological factors associated with employability also contribute to the problem. Therefore, industrial-organizational psychologists should be uniquely suited to contribute to policy solutions for enhancing employability. Russ-Eft (1995) inferred that competencies are the basic elements. These combine to form other competencies that in turn form the element for employability. Nilsson and Ellstrom (2012) also concluded that talent is associated with employability competence, such as generic behavioural meta-competence and personal characteristics that are more difficult to identify than hard technical qualifications. This conceptualization has shifted the focus towards behavioural
questions in recruitment and performance interviews rather than hypothetical questions, internship programmes, trainee positions, and the establishment of appropriate communication with professionals and line managers.

However, it is important to understand that often, skill gap can be a transient issue. UK Commission for Employment and Skills (2011) inferred that a skills gap can be a transient issue especially in cases where some employees may be new to the role, they may be developing expertise, or where the nature of the role is changing to meet new business opportunities. In such cases skills gaps would be expected to decrease over time. However, this is not necessarily negative as it may reflect a business that is innovating and evolving its offer to keep competitive.

The literature review provides an indication of the various factors that may bear a correlation with employability gap. Polyacsk (2009) underlined that some organizations prefer to recruit employees with work experience. However, in some cases recent university graduates have an edge over those with work experience. This is so because they are often more easily adaptable to the companies’ specific needs and culture. Employability may bear an association with the size of recruiter. These expectations of the employer are found to vary with the company size. However, employment status of the job seeker has modest influence on employability.

The Gallup Organization (2010) brought out that some of the expectations differ with the size of the company. The qualification and experience that is demanded by the companies from the potential job seekers differs with their size. Also, companies with operations overseas focus on international mobility. Also, with employability becoming critical for organizations, the concept of job security is diminishing gradually.

Bridgstock (2009) argues that meeting the demands of the employer is far beyond the possession of the generic skills attributes. The author emphasizes the importance of self-management and career building skills to lifelong career management and enhanced employability. Employer demands are often considered as acquisition of generic skills and development of graduate attributes.
Harris (2012) brings out that hiring managers rely heavily on instinct and experience either their own or others within the organization to determine what skills are important for a position and to further evaluate the potential candidates. Spence (1973) evaluates the hiring process from an economic point of view. It infers that it takes time to learn an individual’s productive capabilities which means that hiring is an investment decision. As these capabilities are not known beforehand, this makes the decision under uncertainty. In most job markets, the employer is not sure of how productive a candidate would be at the time he hires him. Even after hiring, this information is not readily available. It takes time to understand the productive capabilities of an individual. Based on the same, often training and development activities are required. Therefore, it can be assumed that hiring someone is frequently similar to purchase of lottery. Employer pays a certain monetary equivalent of the lottery to the individual as wage. It becomes important therefore, for the employers and job seekers, to well understand the expectations from each other.

Pulsinelli (2011) emphasizes that communication between employer and job candidates is quite important. Employers need to have thorough job descriptions, and the job candidate should be prepared to question his concerns regarding position and hiring process. However, understanding and comprehending the demands of the employer is indeed difficult. It is widely agreed that the demands of the employers from the graduates are rising and ever changing. Rothwell and Arnold (2007) proposed an approach for understanding employer expectations that was based on interrelated components which included the wider contextual factors. These are the student’s academic performance and engagement in his/her studies, confidence in his/her skills and abilities, student’s ambition, student’s perception of the strength of the university’s brand, the reputation the student’s university has within his/her field of study, status and credibility of the student’s field of study and the student’s awareness of opportunities in the external labour market.

Martin et al. (2008) brings out that employers find it challenging to recruit graduates with the skills they need for their businesses. Therefore, building graduate employability becomes significant. Employability development has three aspects that include the development of employability attributes, the development of self-
promotional and career management skills and willingness to learn and reflect on learning.

Wen (2011) identified that one of the current problems existing with graduates are weak employment skills. This depicts that the candidates cannot demonstrate his own talent to the employer. While estimating the demands of the employers, it is also important to analyze the expectations and perceptions of the job seeker. Turner and Lowry (1999) reinforced the view that some employers of new graduates are concerned primarily with immediate productivity. They often ignore the expectations of the job seekers. Hence, there emerges a disconnect between employers and these job seekers that further enhances the gap. Arachchige and Robertson (2013) inferred that employer attributes most preferred by job seekers relate to personal growth and career development opportunities and job security. The least preferred employer attributes relate to organizational characteristics such as size, its product or service and the nature of customer-orientation. There also exists a communication gap between employers and job seekers.

Arocena et al. (2007) inferred that the focus is gradually shifting from job security to employability. Today organizations support them in building their skills rather than offering long term assurances in career. Forrier and Sels (2003) argued that lifetime employment within the same organisation is no longer prevailing. Therefore, job security has to be safeguarded differently. In this respect, ‘lifetime employability’ instead of ‘lifetime employment’ has gained prominence.

### 2.3.3 Graduate Employability and the Role of Higher Education

The fundamental role of higher education in making graduates employable cannot be ignored. Archer and Davison (2008) infers that universities need to equip graduates with ‘deep’ intellectual capabilities and a battery of applied practical skills which make them more work-ready. Dickinson (2000) examines that graduate recruiters no longer perceive academic competence alone to be sufficient and call for higher education to produce graduates with highly developed and recognizable transferable skills. Team Lease Services (2012) reports that higher education lacks flexibility, recognition of prior learning, and employer linkages. The weak role of higher education is stressed upon by various other studies.
Tran (2012) highlights that Indian education system is lagging far behind the development of the society. Social understanding and the sensitivity in communication are the more essential at times than professional knowledge. Universities do not help to understand this. Compromising with skills and stressing on academic excellence has been found to be one of the major reasons for rising employability gap.

Harvey (2001) emphasizes that undergraduates are committed to academic excellence. This leads to compromising co-curricular activity participation that contributes to the development of employment related soft skills. Yorke (2006) underlines that the various approaches to bridging the gap include sandwich programmes, periods of work experience and internships. However, it must be agreed upon that to exploit these to the full requires a degree of engagement by both employers and higher education. Such a case is not achievable in practice. The significance of industrial training as an effective tool to enhance graduates’ employability cannot be ignored (Fauzi et al. 2013; Shonefelt et al. 2013). With respect to the technical graduates, Hassan et al. (2013) inferred that the employers hold a positive perception on the employability skills for industrial training students. Not only does such training provide professional ‘feel’ of the actual engineering profession but also contributes to the development of graduate attributes.

Emphasizing the integration of higher education institutions, Khan and Yousaf (2013) infer that higher education system has not been successful in enhancing the graduate employability. Therefore, there exists a need to start job market responsive disciplines in public sector universities. Saad et al. (2013) brought out that there is an urgent need for universities to measure constantly employers’ level of satisfaction with regard to the quality of graduates that universities are churning out every year. This is essential because if universities fail to produce the competent graduates required by employers, it will reflect badly on universities and their ability to understand the needs of industry. Also, universities must ensure that they have constant cooperation with industry in order to understand the changes in the job market.

With a practical perspective, Selvadurai et al. (2012) emphasized that the need for stakeholder-responsibility approach in order to propose a comprehensive solution
to the employability of graduates. This implies that steps to improve transferable skills are not the responsibility of the tertiary education system only, rather it is a combined responsibility of industry and academia. The industry has to play the greater role to provide on-the-job training for skill development of employees. The varying levels of acquisition of generic skills at different contexts, namely university context, placement context, and employer context should be understood.

Thus, it can be concluded that higher education plays an integral role in the development of graduate employability. It is therefore important that the higher education institutions engage themselves with the industry. This would ensure that these institutions understand the requirements of the corporate world and the teaching and learning methodologies are accordingly aligned to meet the industry demands.

2.4 GENERAL PREDICTORS OF GRADUATE EMPLOYABILITY

The pivotal role of employability in the success of organizations and development of economy as a whole cannot be ignored. In order to ensure that the graduates are employable, it becomes imperative to disintegrate the broader employability construct into narrow measurable factors that actually constitute it. These factors provide an indication of the significant predictors of graduate employability. Simply stated, such factors when achieved will enhance the employability of the individual.

It has been observed that as the nature of business varies with the diverse sectors, the expectations and skill requirements of the different sectors from the potential job seekers are different. However, there are a set of generic skills and knowledge areas which are common for the majority of the sectors. Often termed as “soft skills”, “transferable skills” or “generic skills”, these skills can be transferred different work situations.

The different models and frameworks of employability discussed earlier exemplify such factors that act as the indicators of employability. Apart from these, a plethora of literature in the area of employability reveal research studies that highlight such generic factors that indicate the predictors or antecedents of employability. On a broad spectrum, these factors include soft skills and personal attributes of an individual that can be applied to majority of work contexts.
The general factors affecting employability highlighted by the models and frameworks of employability have been summarized earlier in Table 2.2. Further, Table 2.3 provides a listing of the key research studies in the area that highlights the general predictors of employability.

**Table 2.3: Key Researches on General Predictors of Graduate Employability**

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Predictors of Employability</th>
</tr>
</thead>
</table>
| Singh, Thambusamy and Abdullah (2013). | ○ Communication Skills  
○ Problem Solving and Critical Thinking  
○ Teamwork  
○ Lifelong Learning and Information Management  
○ Integrity and Professional Ethics  
○ Entrepreneurship  
○ Leadership |
| Rosenberg, Heimler and Morote (2012) | ○ Basic Literacy and Numeracy Skills  
○ Critical Thinking Skills  
○ Leadership Skills  
○ Management Skills  
○ Information Technology Skills  
○ Systems Thinking Skills  
○ Work Ethic |
| Blom and Saeki (2011). | ○ Core Employability Skills  
○ Professional Skills  
○ Communication Skills |
| Ju, Zhang and Pacha (2011) | ○ Basic Skills  
○ Higher Order Thinking Skills  
○ Basic Work Skills  
○ Social Skills  
○ Personal Traits |
| Dupre and Williams (2011) | ○ Basic Work Skills  
○ Social Skills  
○ Personal Skills  
○ Higher Order Thinking Skills |
| Ramli, Nawawi, and Chun (2010) | ○ Problem Solving and Analytic  
○ Decision Making  
○ Organization and Time Management  
○ Communication Ability  
○ Interpersonal Skills  
○ Leadership and Influence  
○ Creativity, Innovation, Flexibility and Ability to conceptualize  
○ Lifelong Learning  
○ Professional Behavior  
○ Motivation |
| Wickramasinghe and Perera (2010). | ○ Basic Skills,  
○ Higher Order Thinking Skills,  
○ Affective Skills and Traits |
| Singh and Singh (2008). | ○ Problem Solving and Adaptability Skills,  
○ Human Skills, English Language Proficiency and Literacy Skills,  
○ ICT Skills,  
○ Personal Organization and Time Management Skills |
| Van Dam (2004). | Antecedents  
○ Personality characteristics |
It can be drawn from the Table 2.3 that a variety of generic skills or soft skills predict the employability of an individual. A wide range of factors affecting employability have been identified by the different authors. However, it can be noticed from the table above that while there exists a consensus among some of them, many of the factors are overlapping. The diverse range of predictors as identified by the different studies can be broadly categorized the area of technical or subject specific knowledge, individual skills and competencies, and personal attributes.

**2.5 DOMAIN OF THE STUDY: INFORMATION TECHNOLOGY SECTOR IN INDIA**

It is evident from the research title that the present study is focussed on the Information Technology sector in India. Before delving deeper into this sector, it is imperative to understand the general landscape of employability in India. This section discusses the present scenario of employability in India in general across the different sectors and further funnels down to the Information Technology sector.
2.5.1 The Skill Landscape in India

A review of the definitions and concept of employability drawn from the literature suggests that employability goes beyond the mere skills and competencies of individual. It is rather the sum total of knowledge, skills, personal attributes and other contextual factors that enables an individual to secure and sustain employment. However, the vital role of skills in building up employability cannot be ignored. The various models of employability and other research studies in the domain discussed in the preceding sections clearly reflect the fact that skills are integral in developing an individual’s employability. It is because of this fundamental role played by skills that the skill deficit has been observed to be one of vital reasons for employability gap. Considering its pivotal significance, this section further explores present scenario of skills in India, recent trends and future projections.

Blom and Saeki (2011) brings out that there has been an inadequacy in the supply of quality skills thereby acting as a significant impediment to further economic growth in India. Focussed on the newly graduated engineers, the study depicts that IT, infrastructure and power sectors where engineers play a critical role face serious skill deficit and there has been an unmet demand for skills. The study reports that the exporting IT sector reported that lack of skills as the most serious obstacle for growth, and salaries rose 15% annually from 2003 to 2006 mainly due to the shortages of qualified workforce.

According to the report by the NASSCOM and McKinsey (2005), only 25% of the engineering education graduates are employable. Such gaps in skills are primarily caused by two converging factors: a qualitative skills mismatch and quantitative mismatch. The qualitative mismatch is observed where companies do not find graduates employable even when they possess the desired qualifications in their academic records. A quantitative mismatch implies a shortage in terms of numbers. It occurs where not enough potential candidates are available to fill in the vacant positions or they out-migrate to countries where they can earn higher wages.

FICCI (2013) research report highlights the important statistics related to demographics, skill gap and urgency for skill development in India. The country is expected to become one of the most populous nations by 2025, with a headcount of
around 1.4 billion. The Government of India (GoI) has set a target to impart the necessary skills to 500 million people by 2022, in line with its forecast of a significant requirement of skilled manpower over the next decade. However, the country faces a considerable skill development challenge. Around 12 million people are expected to join the workforce every year over the next decade. In contrast, the country has a total training capacity of around 4.3 million, thereby depriving around 64% entrants of the opportunity of formal skill development every year. Moreover, net enrolment in vocational courses in India is estimated at around 5.5 million per year. Clearly, the country faces a major challenge of imparting “employable skills” to its growing workforce over the next few decades. There exists serious gaps between the output of skill development institutions and industry requirements. Out of around 0.4 million engineering students graduating every year in India, only 20% are readily employable.

A recent talent shortage survey conducted by the Manpower Group (2015) concludes that 58% of the employers in India find difficulty in filling jobs. Talent shortages remain to be one of the dominant reasons for such soring percentages. The reasons for difficulty in filling jobs primarily include lack of available applicants and lack of candidates with the required technical competencies amongst others. The technical competencies are the industry-specific professional qualifications and industry-specific skilled trade certifications. Other reasons include lack of experience, lack of workplace competencies, lack of professionalism, lack of enthusiasm, motivation and a learning mind set. IT personnel are among the top 10 jobs that employers are having difficulty filling in. These talent shortages significantly impact the performance of the organizations. The reported impact on the organizations include reduction in ability to serve clients, reduced competitiveness/productivity, increase in employee turnover, lower employee engagement and morale, reduced innovation and creativity in their organization and to higher compensation costs. The study also brings out that talent shortages in Asia Pacific including India are largely driven by the lack of technical competencies in the labor pool.

Survey by leading research organizations like FICCI; Ernst and Young (2012) infer that only 25% of the total Indian professionals are considered employable by the organized sector. According to International Labor Organization, in 2012, 48% of the Indian employers face difficulty in filling jobs due to employability gap. More than 50% of the total population in the age group of 15–59 years are potential learners and
require some type of skill training. The various ministries have created infrastructure for skill development such as ITIs, polytechnics, community polytechnics, secondary schools in association with private sector. The private sector, in association with the government, will work to identify and quantify skill deficiencies in their respective sectors and constitute a sector plan to address these deficiencies. The National Skill Development Corporation or National Skill Development Trust is entrusted with the job to identify areas where support and implementation will be required from the government.

Skill crisis has hit India badly. Team Lease Services (2007) reports that 53% of the Indian employed youth suffer some degree of skill deprivation while only 8% of youth are unemployed. 57% of India’s youth suffer some degree of unemployability. There exists a demand supply mismatch in the country. While 90% of employment opportunities require vocational skills, 90% of Indian schools and colleges output has only bookish knowledge. Poor quality of skills and education show up low incomes rather than unemployment, 58% of graduates make less than Rs. 75000 per year. With the rising population in India, the human resource joining the industry is increasing, so is the problem of unemployability.

ICRA Management Consultancy Firm (2012) inferred that approximately 75 to 80 million jobs will be created in India over the next five years. However, 75% of these new jobs will require vocational training to enhance the employability. There is a pronounced ‘skill gap’ both in terms of quality and quantity; current vocational education and training infrastructure is not geared to meet rising demands of the requirements. Although India churns out a large number of educated people every year, they lack skills that make them readily employable.

Therefore, while in absolute number, there is a surplus supply of manpower, there still exist acute deficiencies in the crucial ‘skilled’ and ‘qualified’ segment. These shortages if not addressed properly can hamper the economic growth of the country. It was found out that 90% of the current 455 million jobs in India are ‘Skill-based’. In order for India to bridge the skill gap, it is imperative that all stakeholders involved, Industry, Academics, Government and Higher education institutions should all come together on a common platform and pave the way for the future in a cohesive manner.
Being a global phenomenon, employers worldwide are facing the same challenge—high levels of youth unemployment and a shortage of job seekers with the “right” skills. McKinsey and Company (2012) addressed the twin crisis of a shortage of jobs and a shortage of skills. It concluded that the various attributes like knowledge, skills, experience, attitude and other factors are misunderstood and misinterpreted by employers and job seekers. This gives rise to a disconnect between recruiters and job aspirants. It calls for a strong need to match the expectations of recruiters with the job aspirants.

NASSCOM (2012) infers that unemployability is one of the major challenges for India today. Low employability is prevalent in the industry with the existing talent with only 10-15% employable graduates in business services and 26% of employable engineers in technology services.

It can be concluded from the above discussed facts and figures in this section that skills are vital in contributing to the employability of graduates. Skill gap has emerged as a daunting problem facing the performance and competitiveness of the corporate world. These gaps can act as a serious impediment to the growth of the companies and development of the economy in general. This calls for a pressing need to plug these gaps in order to balance the demand and supply of human resource and ensure a steady supply of manpower in qualitative and quantitative terms.

2.5.2 The Information Technology Sector in India

This section provides an overview of the Information Technology sector in India, the manpower requirements and the manpower challenges, and the prevalent employability gap in the sector.

*Overview of Information Technology sector*

The Information Technology is one of the fastest growing sector of the Indian economy contributing significantly to the country's GDP. Information technology is considered a subset of information and communications technology (ICT). There are a number of other allied industries that are associated with information technology.
These include computer hardware, software, electronics, semiconductors internet, telecom equipment, engineering, healthcare, e-commerce and computer services. The major sectors of the Information Technology include IT Services, BPO, Engineering services, R&D and products. The sector offers its services to different industries that include Banking, Financial Services, and Insurance (BFSI), Hi-Tech and Telecom, Manufacturing, and Retail.

The IT and ITES industry is growing at healthy growth rates. (National Skill Development Corporation) reports that the industry recorded an appreciable turnover in 2009, with exports accounting for about US $ 47 billion and contributing to over 70% of industry revenues. The industry has grown at a CAGR of close to 30% between 2004 and 2009. As per NASSCOM’s Strategic Review 2013, the industry aggregated revenues exceeding USD 108 billion and employed almost 3 million people. The industry accounts for almost 25 per cent of the total exports and 11 per cent of the total service revenues. NASSCOM (2015) also highlights the enormous growth of the industry. It reports that the industry accounted for 8 per cent of GDP in 2014 and 19 per cent of total exports. The revenues have increased about sixfold between 2004 and 2014. Also, the industry created about 11 per cent of new urban jobs between 2004 and 2014.

**Profile of the People Employed**

The profile of the people employed in Information Technology sector primarily include engineers and other technical graduates at various levels. (National Skill Development Corporation) brings out that people in the sector are employed at the following levels:

- Vertical / SBU Head / Delivery Managers
- Group Managers / Project Managers
- Project Leads / Module Leads / Analysts
- Software Engineers / Senior Software Engineers

As reported in the study, the Indian IT-BPM Industry spans across more than 5000 organisations. It is quite interesting to note that of these, the top 11 organisations employ a third of the total workforce. Also, these handful of organizations deliver
around half of the industry's revenues. The reputed employers in the sector include Infosys, TCS, Tech Mahindra, Wipro, HCL, Polaris Lab among others. In terms of courses, Engineering and Computer Application will continue to remain the key courses providing technical education.

**Manpower Requirements and Challenges**

As per the National Skills Mission, 500 million professionals would need to be skilled by 2022, to make them employable. National Skill Development Corporation reports that Indian IT-BPM Industry currently employs about 3 million people directly and about 9 million, indirectly. As per NASSCOM (2009), the industry has a potential to contribute to, as much as, 30 million direct and indirect employment opportunities by 2020. National Skill Development Corporation outlines the growing need for skilled manpower in Indian information technology industry. It is expected that the Indian IT and ITES Industry would record about US $220 billion in exports and US $60 billion domestically by 2022, totalling to about US $260 billion growing at a CAGR of 12.8%. Based on the trends of IT and ITeS industry, it is expected that the industry would employ about 7.5 million persons directly by 2022. A large portion of this employment is expected to occur in the ITES (BPO/KPO) exports sector, followed by IT exports and then in the domestic market. The incremental human resource requirement in the IT and ITeS sector is expected to be about 5.3 million persons till 2022.

Although the Information Technology is growing at healthy growth rates and poses high manpower requirements in the forthcoming years, it is quite unfortunate that this sector is facing serious manpower challenges primarily in qualitative terms. NASSCOM (2009) reports that talent over-supply and low employability is leading to under-employment and supply deficit for the industry. This can hamper the growth of the sector in future. Graduate talent supply for the IT-BPM Industry is not just restricted to engineers or technically qualified talent. As the information technology sector has penetrated into a number of other sectors through the scope of services that it offers, almost every professional is part of the potential talent pool.

Out of the 5-5.5 million graduates that pass out every year, only about 0.6-0.7 million are considered employable by Tier 1/Tier 2 companies. Although the
manpower supply is exceeding the demand, the employers in the sector still face
difficulty in finding the “right” talent and filling up the vacancies.

Therefore, it is quite evident from the above discussion that developing the
right talent in line with the demands and expectations of the employers has gained
utmost significance. Dealing with the talent supply mismatch and low employability
of graduates is imperative to ensure the steady growth of the sector in future

**Employability Gap in Indian Information Technology Sector**

The Information Technology Sector has made an unparalleled impact on the Indian
economy. However, the sector is striving to deal with the challenges of talent supply
mismatch, skill shortages and low employability in order to maintain its global
leadership position. This calls for a pressing need to bridge this gap and ensure a
steady supply of skilled workforce to meet the rising manpower demands of the sector
in the forthcoming years. This section focuses on employability gaps in Indian
information technology sector and brings about the perspectives of employers and job
seekers.

NASSCOM (2014) reports that there exists an oversupply of talent and low
employability in Indian IT sector. The research study indicates that that of the ~0.6-
0.64 million candidates willing to work in the non-BPM sectors (IT Services,
Software Products and Engineering and R&D), around 0.15-0.18 million are deemed
employable. Talent crunch has also been brought out by (NASSCOM , 2012) that
reveals that talent supply in India is constrained by the lack of targeted skill
development in domestic market and is limited to 1 million people with a shortfall of
800,000 people.

Further investigating the the supply of manpower in qualitative terms, FICCI
(2012) inferred that engineering colleges in India have been growing by 20% per year
and more than 4.5 lac engineers graduate every year which is greater than USA, UK
and Japan. Although the number of students enrolled increased 800 percent from
1998 to 2010, this quantitative growth has rather led to an average decline in the
quality of the graduating engineers. More than 60% of employers were not satisfied
by the quality of graduates passing out the engineering colleges.
The dynamic nature of the IT industry and the changing demands of the employers are further widening this gap. While the technical expertise of a candidate was the prime requirement of the recruiters earlier, currently there is an increased attention on the soft skills and personal attributes as well. Lavy and Yadin (2013) bring out the conceptual shift in the comparative importance of IT professionals over the last decade. The study shows that since IT plays a significant role for the overall organizations' wellbeing, the IT employees have to communicate with other business functions and all managerial levels. Also, as the IT based solutions become more complex, larger teams are required for development. Hence, both “hard skills” and “soft skills” are considered as significant for employers. However, a gap has been acknowledged by many researches between these two categories of skills. Chandran (2012) highlights this gap and infers that as the country is slowly emerging as a provider of information technology products, this skill gap is expected to influence the growth of the product companies in India. The country produces more than five lakh engineers annually, but only 2.68% meet the skill requirements of the IT products sector. Nearly 92% of engineering graduates lack computer programming and algorithm skills required for IT product companies whereas 56% show lack of soft skills and cognitive skills. Aspiring Minds (2011) conducted an employability survey. The results reveal that even though India produces more than five lakh engineers annually, only 17.45% of them are employable for the IT services sector, while a dismal 3.51% are appropriately trained to be directly deployed on projects. Further, only 2.68% are employable in IT product companies, which require greater understanding of computer science and algorithms.

With this as backdrop, it becomes rather significant to understand the paradigm change in the expectations of the recruiters in the IT sector. CompTIA (2012) reports the vital challenges being faced by the companies as a result of this widening employability gap. It brings out that most organizations indicate that the employability gap affects at least one business area such as staff productivity, customer service and orientation and security. However, employers believe that they do not have a method of identifying skill gap. Also, the study indicates that human resource function in the organizations is reactive rather than proactive on the skill gap issues.
The above discussed statistical indicators are evident of the fact that employability gap and talent supply mismatch pose a daunting challenge for the growth IT sector and needs to be addressed urgently for its stable growth.

2.6 EMPLOYABILITY PREDICTORS FOR TECHNICAL GRADUATES

The various research studies conducted in the area of employability have acknowledged that a variety of skills and knowledge areas that make the job seekers employable. There are a generic set of talent requirements that are common to a majority of the sectors. However, depending on the nature of the industry, every sector has its own set of needs and demands and job seekers are expected possess these sector specific requirements as well to meet them.

It can be drawn from the literature that diverse knowledge and skill areas are significant for employment of technical graduates. The key requirements from technical graduates can be categorized in the broad areas of technical attributes and non-technical attributes. While the technical attributes refer to the “hard skills” and comprise of the technical skills and discipline specific knowledge; the non-technical attributes comprise of soft skills, business and functional knowledge and personal attributes.

It was more than four decades ago, in the year 1972 that Ashenhurst reported the result of the research of ACM Curriculum Committee on Computer Education and Management (Ashenhurst, 1972). The 37 skills and abilities that should be acquired were grouped in six categories i.e. people, model, system, computer, organizations and society. Since then at this backdrop, a plethora of researches have been conducted that suggest the knowledge, skills and abilities that the graduate must possess. A vast majority of these studies have highlighted the specific technical and non-technical skills that are required in this sector (Havelka and Strong, 2006; Bassellier and Benbasat, 2004; Noll and Wilkins, 2002; Yen et al., 2001; Trauth et al., 1993; Lee et al., 1995; Nelson, 1991)

Yen et al. (2001) identified the critical knowledge and skill sets required from candidates in the information systems sector by means of a survey. This survey classified the knowledge and skills for IS graduates in four broad categories that
include IS Technology management knowledge / skills, organizational and societal knowledge/ skills, interpersonal knowledge / skills, personal knowledge / skills. Also, the study concludes that there are educational gaps in the IS knowledge and skills required from job seekers. Similar antecedents of employability were also discovered by Lee et al. (1995) that were identified through in depth interviews conducted with IS managers. The study highlights that the industry will demand a cadre of IS professionals with knowledge and skills in technology, business operations, management and interpersonal skills. The knowledge and skill areas that make IS graduates employable can be categorized into Technical specialities knowledge / skills, Technology management knowledge / skills, business functional knowledge / skills, Interpersonal and management knowledge / skills.

The importance of soft skills for IT professionals cannot be ignored. McMurtrey et al. (2008) concluded that the most significant skills for new IT professionals were soft skills, specifically the personal attributes of problem-solving, critical thinking, and team skills. However, the study also established that technical skills were essential, especially database knowledge and proficiency, knowledge of programming languages, object-oriented knowledge, and web development skills. Some skills were not considered very important, particularly specialized software for applications. Apart from technical and soft skills, the study also highlighted the importance of business expertise including knowledge of organization knowledge and understanding of the business environment.

Aasheim et al. (2009) also examined the knowledge and skill requirements of IT graduates. The findings suggested that technical skills, personal and interpersonal skills and organization knowledge of primary business functions are significant requirements. Further investigating the skill requirements from the perspective of end user personnel, Nelson (1991) discovered that organizational knowledge, organizational skills, organizational unit, and general IS knowledge, technical skills and IS product skills are the required competencies from IS graduates. Conducting a longitudinal study to understand the knowledge and skill requirements for entry level IT professionals, Aasheim (2012) considered technical skills, knowledge of primary business functions, knowledge of company’s specific industry, understanding impact of IT, knowledge of the company and a wide range of soft skills as significant.
Through the campus recruitment drives of Indian software service companies, Gokuladas (2011) identified predictors of employability of undergraduate engineering. The study found that knowledge of engineering (GPA) and proficiency in English language are important predictors of continuous employability of engineering graduates in campus interviews of software services companies. The other indicators of employability include problem solving, verbal reasoning and logical reasoning and soft skills that include problem solving, attitude, interpersonal skills and presentation skills. However, a striking difference in the expectations of the practitioners and what new hires are delivering has been reported by Tesch, *et al* (2006). It brings out that poor interpersonal skills are associated with failure of newly hired employees. The study infers that the skills required from IS graduates can be categorized as personal and interpersonal skills. The interpersonal skills include leadership, teamwork, project management, system analysis and design. Personal skills include oral and written communication, ability to listen, conceptual thinking, critical thinking, creative thinking, self-motivation and ethics.

Legier, Woodward and Martin (2013) inferred that the most significant “soft skills” needed of IT personnel should include: a) communication skills verbal aptitude, b) problem solving skills especially problem definition, c) greater facility with teamwork and collaboration, d) ability to manage and motivate one’s self, and e) contextual knowledge of the work - Why, Whom, and When. John (2011) highlights that UK has been in the grip of IT skills shortage. However, a detailed analysis reveals that a lack of good management, professional discipline and productivity is the major cause rather than manpower shortage.

Simon and Jackson (2013) also concluded that the 21st-century IS professional must blend technical and interpersonal skills to effectively understand and communicate business operations and organization strategies. Therefore, skill requirements must be understood within the organization and clearly communicated between recruiters, job applicants, and academia. While academia is addressing most of the technical skills through course content, nontechnical skills are required for the development beyond the traditional classroom environment.

Radermacher and Walia (2010) survey report indicates that the competencies of job seekers do not match the demands of recruiters. The most frequently identified
deficiencies by the employers among job aspirants in IT sector include oral communication, teamwork, project communication, problem solving, written communication, testing, programming, critical thinking, ethics, configuration management and user design interface. Their study further underlines the strong need to close these knowledge deficiencies to bridge the gap between corporate and potential employees.

Boyle and Strong (2006) conducted a survey with IT professionals involved in the implementation and support of ERP systems. The study brought out that the skills required from ERP graduates include Technical Knowledge, Technology Management Knowledge, Business Functional Knowledge, Interpersonal Skills and Team Knowledge and Skills.

Benemati (2007) conducted a survey among IT professional to understand what skills they expect from new IT hires out of college. The study brought out that technical skills particularly programming skills are sought after. Many organizations placed emphasis on soft skills or non-technical skills that include leadership skills, communication skills and knowledge of business. The companies also look for talent and desire from graduates. This includes qualities like ability to learn, aptitudes and attitude. The survey also brought out that the companies found communication skills and business knowledge skills as most lacking among the recent graduates.

According to Williams (2011), possession of core technical skills is not enough. Graduate candidates with technical skills lack business know how which is equally essential. Luftman and Kempaiah (2007) brings out the top 10 IT skills expected from entry level graduates. These include communication, Functional Area Knowledge, Systems Analysis, User Relationship Management, Systems Design, IT Architecture/Standards, Managing Expectations, Industry Knowledge, Business Process Design/Reengineering, Project Plan/Budget.

Therefore, it can be inferred that the technical abilities, general business and organization knowledge and soft skills act as the predominant indicators of graduate employability in Information Technology sector.
Section 2.4 of this chapter depicts the general factors that constitute graduate employability. However, every sector has its own specific requirements and in turn, explicit expectations from employees. Accordingly, the domain specific requirements differ from one sector to another. Through an appraisal of literature especially focused on Information Technology, Information Science and allied sectors, the research variables under consideration have been examined. These variables provide an indication of the factors that affect the employability of technical graduates in these sectors. Table 2.4 summarizes the key researches for the classification of IT / IS knowledge and skill areas that indicate the factors that affect the employability in this sector.

Table 2.4 : Key Researches on classification of IT / IS knowledge and skill areas

<table>
<thead>
<tr>
<th>S.No</th>
<th>Author</th>
<th>Attributes</th>
<th>Nature of Study</th>
<th>Research Objective</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eom and Lim (2012)</td>
<td>Personal Traits, Communication and Problem Understanding, Collaboration and Project Management, IT Facilitation and Promotion</td>
<td>Empirical</td>
<td>Investigate most requisite skill set for IT professionals</td>
<td>IT Personnel across various industries</td>
</tr>
<tr>
<td>2</td>
<td>Debuse and Lawley (2009)</td>
<td>Experience, Technological Skills, People Skills, Business Skills, Theoretical Skills</td>
<td>Qualitative</td>
<td>Identify key attributes sought after by employers from ICT graduates</td>
<td>Web Content Mining</td>
</tr>
<tr>
<td>3</td>
<td>Tesch et al. (2008)</td>
<td>Personal Traits, Interpersonal and Management Skills, Technical Skills,</td>
<td>Empirical</td>
<td>To examine the employers’ perceptions and expectations of IS entry level personal and interpersonal skills</td>
<td>IS professionals across different industries</td>
</tr>
<tr>
<td>4</td>
<td>Bailey and Mitchell (2006).</td>
<td>Technical Skills, Business Skills, Soft Skills</td>
<td>Empirical</td>
<td>To capture the perceptions of employers of the competencies needed from computer programmers</td>
<td>IT professionals from IT companies</td>
</tr>
<tr>
<td>5</td>
<td>Kovacs et al. (2005)</td>
<td>Personal Productivity Software, Project Management, Network Administration, Systems Development,</td>
<td>Empirical</td>
<td>To capture the perceptions of IT professionals on what skills are important for IT</td>
<td>IT personnel across different industries</td>
</tr>
<tr>
<td></td>
<td>Programming Languages, Web Development</td>
<td>workforce</td>
<td>To determine knowledge and skills required from entry level IS hire</td>
<td>IS recruiters</td>
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<tr>
<td>6</td>
<td>Fang et al., (2005)</td>
<td>Core IS Knowledge, Organizational, Interpersonal Skills, Personal Skills</td>
<td>Empirical</td>
<td>IS recruiters</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Lee et al., (2002)</td>
<td>IS core knowledge, Organization and Society, Interpersonal, Personal Traits</td>
<td>Exploratory</td>
<td>IS academics and IS practitioners</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>McMurtrey et al., (2002)</td>
<td>IS core knowledge, Proficiencies, Business Expertise, Personal Traits or characteristics</td>
<td>Empirical</td>
<td>Organizations across different industries hiring entry level IT professionals</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Yen et al., (2001)</td>
<td>IS Technology knowledge / Skills, Organizational and Societal Knowledge / Skills, Interpersonal Knowledge / Skills, Personal Knowledge / Traits</td>
<td>Empirical</td>
<td>IS practitioners</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Trauth et al., (1993)</td>
<td>IS Tasks, Technical Skills, Interpersonal and Business Skills, Qualitative and Quantitative</td>
<td>Qualitative</td>
<td>IS Managers, consultants, recent graduates and IS professors</td>
<td></td>
</tr>
</tbody>
</table>
Retrieving from the literature, the table above presents a summary of key researches on classification of IT / IS knowledge and skill areas.

2.7 GRADUATE EMPLOYABILITY AND STAKEHOLDERS’ PERCEPTION

It can be established from the various research studies that employability gap and talent supply mismatch is in existence in a majority of sectors. Although a consensus can be observed among the employers in terms of their talent demands from job seekers, there still exists a perception and expectation gaps between the different stakeholders. These differences in perceptions exists both in general and in the specific context of Information Technology Sector.

Wickramasinghe and Perera (2010) compared the perception of graduates, university lecturers and employers in Sri Lanka on employability skills and found differences in the priorities given to the various employability skills by these three stakeholders. On similar lines, DuPre and Williams (2011) identified a gap in the skills employers seek and students’ perceptions of their abilities in those areas in US context.

With a focus on IT / IS sector, Lee et al.(2002) found that there are significant perception gaps between IS academics and practitioners in terms of the required skills. These skill areas include IS core knowledge, organization and society, interpersonal skills and personal traits. Highlighting these perception gaps, McMurtrey et al. (2008) indicated that understanding the skill sets expected from an IT personnel is significant for both companies and academic or training institutions. Because of its very nature, the Technology and IT practices are changing at a fast
pace and, in turn, this alters the skills required from the IT professionals. As the companies invest huge resources in training personnel, particularly new IT employees, it is important for educational institutions to understand the changing needs of the employers in order to plan an effective curriculum. Turner and Lowry (1999) also report perception gap between the IS graduates and employers. Trauth et al. (1993) discovered the expectation gap through the data collected from groups IS managers, IS consultants and IS professors to identify the key skills and knowledge that would be required from IS professionals. A gap was observed between the needs of the industry and the abilities of the graduates.

2.8 LEARNINGS FROM LITERATURE REVIEW AND RESEARCH GAPS

The key learnings from the literature review have been summarized in this section and the research gaps have been identified.

2.8.1 Learnings from Literature Review

Key literature on employability and the gap has been reviewed in general and that focused specifically on Information Technology sector. The review has been done across major online resources like EBSCO, ProQuest, Elsevier, and Emerald spanning across reputed books, journals and articles. This extensive literature has been analysed to present the above review.

The key learnings of this literature have been summarized below:

- Employability is a complex and multidimensional construct. It can analyzed differently in different contexts and perspectives. There exist apparent differences in the meaning of employability, however, on a broad spectrum it can be regarded as the essential knowledge, skills and personal attributes that enable an individual to secure and maintain employment.

- Various models and frameworks of employability have been established that translate the broad theoretical construct into measurable dimensions. Though the various models comprehend employability differently, the vital significance of skills in constituting the employability construct is quite evident.
• “Soft skills” or “Generic Skills” are found to be the key predictors of graduate employability apart from other knowledge areas, personal attributes and situational factors. These are the skills that can be transferred in a wide variety of job context.
• “Employability gap” is a global phenomenon and remains to be one of the critical problems being faced by the world today. Several sectors in India are hit by the skill gap, talent crunch and demand supply mismatch. This gap is one of the critical reasons for hiring challenges being faced by the recruiters.
• The employability gap has hit majority of the sectors of the Indian economy, including the Information Technology sector. With the sector contributing significantly to India’s GDP and posing astoundingly high manpower requirements by 2022, it is startling that finding employable workforce has been a challenge for a majority of recruiters.
• The various research studies focused on Information Technology sector imply that only technical knowledge or academic excellence does not suffice to secure employment in the sector. Both technical skills and non technical skills are sought after by the employers while hiring graduates for potential jobs.
• There exists a noteworthy gap in the perceptions of the stakeholders on skills and employability. These stakeholders include academia, industry and the graduates. Their expectations and perceptions on these employability attributes are different leading to a notable gap.
• The rising employability gap has a serious impact on the competitiveness and performance of organizations. Especially for a high growth sector like Information Technology, there exists a pressing need to bridge this divide and ensure a steady supply of manpower.

2.8.2 Research Gaps

The present research is significant as it can fill in the gaps that are surfaced through the literature review. The following research gaps have been identified:

• A plethora of literature addresses employability skills and skill requirements from graduates. However, it has been observed that much of the information is theoretical in nature. Majority of the studies consider the absolute aspect of employability, provide factual data and offer policy recommendations.
• The abundant literature available on employability addresses the issue in a
generic sense. Limited literature is available that is exclusively focussed on
employability in Information Technology Sector. Further, in Indian context,
the available information is scarce.
• Although there is ample information available on what skills are demanded by
the industry from the graduates, there are limited numbers of studies that
examine the perceptual differences among the stakeholders on the required
skills.
• It has been observed that a vast majority of studies on employability and skills
are restricted to the Western countries. There are not many studies confined to
Asian countries.
• There is a dearth of literature that establishes a framework for antecedents of
employability with respect to Information Technology sector. This leaves a
room for the establishment and empirical validation for such a model.
• There are few evidences in the literature regarding perception differences
among the employers, graduates and academia on the required skills for
employment. However, very few studies are focused especially on the
Information Technology sector to analyze this gap.
• No comprehensive framework for employability has been proposed and
empirically tested in the context of Indian IT sector.
• No study was found focussing on perception differences among employers and
graduates in Indian Information Technology Sector.

2.9 CHAPTER SUMMARY

The review of literature that has been discussed in this chapter brings out that
employability is a multifaceted construct. The well-established models of
employability proposed over the years that translate this theoretical construct to
measurable variables have been perused. Further, the chapter discussed about the
Indian Information Technology sector highlighting its growth and contribution, the
profile of the people employed, the manpower requirements and challenges and the
employability gap prevalent in the sector. The predictors of employability and the
nature of employability gap, both in general and that in context of Information
Technology sector has been elaborated. Further, significant aspects like the skill
landscape in India, role of higher education institutions and perceptual differences among stakeholders have been examined. Also, the key learnings have been summarized and the research gaps have identified that provide a foundation for building up the research model that is discussed in the next chapter.