CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section reviews the literature pertaining to the competencies and personal qualities of information professionals and explores the concepts and variables surrounding these issues. An extensive search was carried out to obtain printed and electronic secondary sources at local libraries and abroad. Literature reviews abroad were conducted at the Monash University Libraries, RMIT University Library, and Melbourne University Library in Australia. In Hong Kong, literature reviews were accomplished at the University of Hong Kong Library, and the University of Science and Technology Library. In Singapore, secondary sources were collected at the National University of Singapore Library, and Nanyang Technological University Library. The sources consulted included LISA Net (Library and Information Science Online), ALISA Online (Australian Library and Information Online), EMERALD, BPO (Business Periodical Online), IPO (Inspec Ondisc), Ebsco Host, the Internet, professional journals related to library and information science, conference papers, and other materials related to the issues of the Multimedia Super Corridor.

The keyword used to access relevant articles included *competencies*, *skills*, *attitudes*, *personality traits*, *employability skills*, *information professionals*, *knowledge workers* and the *Multimedia Super Corridor*.

Personal visits and interviews were carried out to get primary data. To obtain primary data, the researcher conducted an interview with Professor David Arnott of Monash University and Associate Professor Barry McIntyre of the RMIT University in Australia.

The review is organised into five main sections. They are:

1. Definitions of information professionals.
2. Employability skills.
3. Competencies for information professionals.
4. Personality traits of information professionals.
5. Roles for future information professionals.

2.2 Definitions of Information Professionals

Fritz Machlup who started identifying knowledge work in the 1950's was perhaps the first scholar to recognise the rapid emergence of an information industry in the United States (Corcoda, 1998). Machlup (1998) studied knowledge and its creation, distribution, and economic significance in the American economy. Machlup argued that there was a new type of worker responsible "*for the entire spectrum of activities, from the transporter of knowledge up to the original creator*" (Corcoda, 1998:xvi).

In the 1970's, Porat (1998) conducted one of the largest American studies on the area of knowledge professions. In 1977, he published his findings about the nature of knowledge work and identified the primary knowledge professions of the period. He classified information workers into knowledge producers, knowledge distributors, market search and coordination specialists, and information machine workers. He categorised librarians and archivists as "public information distributors" whom he classified under knowledge distributors (Porat, 1998).

However, according to Porat, these workers could not apply the publicly available knowledge without an information intermediary. In an information-rich world, developing skills to package information in the right form, at the right place and at the right time is useful (Porat, 1998).

Griffiths and King (1986) defined information professional within the scope of information profession and of library and information science, and the environment they worked. Their study on competency requirements of librarians and information professionals focused on the types of information professionals, the functions they performed, and their employing organisations. All information professionals who performed similar information-related functions and had similar competency requirements to perform their work were included in their study. Professional activities that involved processing, recording, storing and accessing of information; and functions involving bibliographic information were included in the definition of information professionals. Others included were those who managed information programmes, performed information research, designed and developed information technology (IT), or educated and trained information workers and users. However, they did not include professionals engaged in information creation, communication, and end-users (e.g., translators and programmers) for the reason that their knowledge and skills were so specialised.

Debons *et al.* (1981) cited in Agada *et al.* (1994:1) defined information professionals as being "*concerned with content (the meaning applied to symbols) and therefore with the cognitive and intellectual operations performed on the data and information by a primary user.*" Their primary functions would be finding, analysing, and preparing information for others; designing information systems; and training information workers.

Agada *et al.* (1994) remarked that the personality studies of librarians between 1940 and 1980 supported the popular image of librarians as submissive, passive and self-abasing. Ten years later, Agada *et al.* (1994) compared the assertiveness and empathy of graduate library students differed with their peers in business and counseling. The

results indicated that the library students differed from their business peers on negative assertiveness and the counselling peers on personal distress. Agada *et al.*'s (1994) study suggested that the old public image of the librarian might still be the distinguishing factor of the profession's identity.

Mason (1990) defined information professionals by their functions. He categorised seven information careers as information professionals: accountant, archivist, librarian, records manager, information systems analyst (MIS), management scientist, and museum curator. He noted that regardless of their area of specialisation, all information professionals were mediators and had one purpose in mind: "*to get the right information from the right source to the right client at the right time in the form most suitable for the use to which it is to be put and at a cost that is justified by its use*" (Mason, 1990:125). According to Mason, the activities of these professions had overlapped. However, Agada *et al.*'s (1994) study found that the current overlap in functions obscured important differences in the personal attributes, skills and attitudes that defined each profession. Such personal characteristics differentiated librarians from other information professionals than their functions.

A recent definition of information professionals was developed by the Europe of Cultural Cooperation (2002). The body defined information professionals as follows:

> "Information professionals are defined by the role to mediate between information originators, information providers, information users and information technologies. As mediators, they are defined by key competencies in terms of technical skills in the field of the ICT, consisting of organising information and making it retrievable, and professional and social skills consisting of processing information in accordance with the providers' and users' needs."

Further, McGovern (1999) cited in Abell and Oxbrow (2001:97) mentioned that the qualities of information professionals included: (a) highly adaptable and eager to learn new things, (b) good at searching, evaluating and managing information, (c) computer literate, (d) self-motivated, (e) creative and innovative, (f) excellent communication

skills, (g) good at working in teams, (h) good networking skills, and (i) mobile and independent-minded.

With the emergence of information and communication technology (ICT) and the knowledge society, the terms "information professionals" and "knowledge workers" have become synonymous and both are the key professional agents in the content industries (The Europe of Cultural Cooperation, 2002). In the context of the Multimedia Super Corridor (MSC), the terms "information professionals" and "knowledge workers" are used interchangeably in this study.

2.2.1 Knowledge Workers

In organisation, knowledge workers are part of knowledge groups. The formal group of knowledge workers forms part of an organisational function or activity such as R&D, designing, marketing, developing a new product, and providing customer support. While the informal knowledge group contributes very little to the organisation's core competencies and knowledge, yet they are reservoirs of potential tacit knowledge (Chase, 1998).

At the Media Roundtable Discussion on MSC in conjunction with Multimedia Asia '96, it was observed that:

> "Knowledge workers are a new breed of workers who need flexibility to excel in the workplace as a lot of creative and intellectual work is involved. They work best at their peer level and strive on flatter organisation structures. It also means that the new workplace will have to do away with the pyramid structure that has been in existence for a long time now. The big companies that would be invited to operate within the MSC must manage their workers differently. They should be allowed to work at flexible hours with physical changes to the office environment and facilities that are in place now. (Prasanna, 1996)

Select and Maruchek (1994) quoted by Allen and Wilson (1996) referred to knowledge workers as those who possessed high levels of education, experienced

organisational status, and thus are allowed to exercise considerable autonomy and discretion in performing their work.

The MDC defined knowledge workers as those who have the following:

1. Five or more years of professional experience in the field of multimedia/information technology or in the field that is a heavy user of multimedia; or
2. A university degree (any discipline), or a graduate diploma (in IT/multimedia) from a recognised technical college, plus two or more years of professional experience in multimedia/IT business or in a field that is a heavy user of multimedia; or
3. A Master's degree or a Ph.D. in any discipline (Multimedia Development Corporation, 1999d).

For the MSC, one of the major challenges is the development of human resources. To fulfil the needs of the MSC, Malaysia must educate and train thousands of engineers, programmers, system analysts, and other knowledge workers for the MSC workforce. Along this line, libraries and information professionals will play major roles in the development of human resources. The information professionals are empowering end-users to deal systematically with electronic information overload, to exploit multimedia for education and research, to create more local content, to access content, and to use web technologies for lifelong learning (Reid, 1998b). At a Multimedia Asia Conference, Reid informed delegates that soft information skills were needed to develop a high-tech multimedia community ("Multimedia Super Corridor: From Vision to Reality," 1997). For the future of the MSC, Malaysia has to train knowledge workers. She further cited that in the United States, the Library of Congress trained Cabinet members on Internet navigation. There are already a few countries that have

developed training on both technical and soft skills. Soft information skills consist of information navigation, analysis and conceptual design of global services, synthesis, and evaluation and repackaging of services. Specialised training is required for employees. As such, companies should contribute by preparing their workforce to learn to use information and not just acquire it to be used when operating in the MSC (Sharifah, 1996).

It was mentioned that 100,000 knowledge workers would be needed in the next five years (Ramlan, 2000). The MSC status companies were expected to create more than 35,000 jobs for knowledge workers. More than 600 public and private universities and colleges will help meet this demand by producing the required numbers of competent manpower. Malaysia is preparing to transform itself into a knowledge-based economy. To fully realise MSC status in the future, information technology requires innovative programmers, information managers and electronic engineers. Therefore, the key challenge facing the country is the ability to produce quality human resources (Mohamed Arif, 1999) and the problem of the shortage of knowledge workers has to be dealt appropriately.

2.2.2 Shortage of Knowledge Workers

Knowledge and people skills is expected to account for the biggest share of assets in a Knowledge or K-economy ("Fong: Knowledge Skills Vital in K- Economy," 2000). Basically, the knowledge workers issue was seen as the most critical aspect of the future success of the MSC. The MSC has good infrastructure development, but lacks the soft infrastructure of knowledge workers. The MDC has given an assurance of providing the numbers needed in the next few years, both for MSC and the country (Ridzuan, 2000).

demanded by the industry, but there had been a mismatch between the demand and supply.

The current shortage of skilled IT professionals in Malaysia is one of the biggest concerns for the MSC. Many IT companies are finding it difficult to retain highly experienced and skilled workers ("Confronting the Realities," 1998, "NTT to Develop New Devises in MSC," 1996).

The MSC initiative, as a test-bed for exploiting technological advances such as multimedia, has created a great demand for skilled information technology workers. The government as well as the public and private education institutions have to find ways to help fulfil the demand. Currently, the demand for knowledge workers having the required skills is exceeding the supply (Azlyn, 2000). To help solve this problem, opportunities must be given for companies to retrain its employees so that they can be part of the IT skilled workforce ("Multimedia Super Corridor: The Way Ahead: Closing Session," 1997).

2.2.3 Roles of Institutions of Higher Learning for MSC

The government has taken efforts to help relieve the problems associated with the shortage of information technology knowledge workers. Tengku Mohd *et al.* (1999) recognised training as one of the solutions to relieve problems related to the shortage of manpower. To achieve the objective of MSC, a more comprehensive approach in training future IT knowledge workers needs to be adopted. In relation to that, more training centres have been established in Malaysia. There were suggestions that institutions of higher learning and training centres need to review their computer curriculum. Government institutions of higher learning, such as universities, have taken steps to improve their Computer Science and IT undergraduate curriculum.

The success of the MSC initiatives hinges greatly upon the workforce created to meet the requirements of companies operating within the multimedia hub. Institutions of higher learning (IHLs) obviously play a significant role in shaping the MSC, as its progress depended upon the quantity as well as the quality of skilled personnel produced by these institutes. (Multimedia Development Corporation, 1997:17)

The MDC, in recognising and acknowledging the institutions of higher learning's role, has set up a Higher Education MSC Scheme in December 1997 to award MSC status and incentives to deserving institutions. The scheme, called the MSC Status Scheme for Higher Education has three objectives: (a) to encourage and support local institutions of higher education to become world-class IT training centres; (b) to increase the local supply of IT knowledge workers, particularly to meet the requirements of the MSC status companies; and (c) to make Malaysia a regional hub for IT education and training. It was noted that the IT-related education and training is one of the fastest growing sectors in the local institutions of higher education (Multimedia Development Corporation, 1999d).

Those institutions that are successful in attaining MSC status will be able to enjoy the incentives offered, which include financial, non-financial and environmental benefits. Financial incentives will come in the form of five to ten years of tax holidays or a hundred percent investment tax allowance. Non-financial benefits include the unrestricted entry of knowledge workers, duty free importation of information technology equipment, freedom of ownership and the freedom to source funds globally. Those granted MSC status would be able to utilise the world-class sophisticated information technology and telecommunications infrastructure. They will also benefit from eco-friendly surroundings - provided they are located within the boundaries of the MSC. Students will be exposed to world class research and development efforts and

eventually attach themselves to multinational companies (Multimedia Development Corporation, 1997).

Seven requirements must be met before the MSC status is conferred and these are:

- Heavy user of multimedia products and services.
- Grant diploma and/ or degree in respect of approved courses.
- Establish a multimedia faculty or an appropriate management authority for administering the operations of approved courses.
- Employ a substantial number of knowledge workers.
- Conduct and support R&D activities.
- Be registered as a separate legal entity or create an accounting entity for the qualified faculties conducting approved courses; and
- Comply with all statutory requirements of the Ministry of Education for the commencement of operations (Multimedia Development Corporation, 1999d).

The future commercial environment for Malaysia has been identified as a multimedia-based economy. The Malaysian government is therefore looking into the efforts to acquire the relevant multimedia expertise. Through coordination and guidance from the Education Ministry, part of the role to prepare a multimedia-skilled workforce for the country is given to the national education system, which itself presents a strong challenge. Local universities including private institutions of higher learning are assisting the government by providing more courses on information technology and multimedia. Several private universities and colleges are already offering such courses. The Multimedia University is one such private university which is located in the country's intelligent city, Cyberjaya, while the other institution is the Telekom University or Unitele (Sharifah, 1997).

The 21st century will see information, multimedia technology, and knowledge workers driving the world economies. Hence, the education system must take a whole new approach in developing employees of the 21st century. Institutions of higher learning should not only provide a sound academic foundation but also industry relevant skills (Chandra Devi, 1999).

The information technology in the country is growing at an almost explosive rate. Internet start-up companies are fast flourishing to gain a piece of the electronic business share. It is foreseen that there will be a strong relationship among management environment, electronic commerce environment, including business-to-business, business-to-customer, e-commerce, wireless Internet applications and finally in storage solutions (Prasanna, 2000). The sort of situations needing knowledge workers include sales/ business professionals who wants to develop their business in the targeted commercial sectors, whether in telecommunications, financial, manufacturing or other corporate sectors. The sales professionals with strong direct business contacts and knowledge in the respective fields will be in demand. The other area is subject matter experts who can match clients to technology for their business process. These are the people who understand the clients' businesses and are instrumental in more complex bids. These people are termed as practicing directors/managers, and consultants; and implementers such as project managers, system analysts, post-sales consultants and those with web-based skills set (Prasanna, 2000).

These quality human resources should be equipped with the employability skills required by their potential employers. Fortunately, many institutions of higher learning, private as well as public, have taken steps to meet this rising demand.

2.3 Employability Skills

The rapid technological advancements have necessitated a redesign of the workplace into an innovative work environment known as the high-performance workplace. This environment requires a behaviour and orientation towards work that go beyond step-by-step task performance. Knowledge workers who demonstrate highly skilled, adaptive blend of technical and human relations ability are recognised by employers as their primary competitive edge (Overtoon, 2000). Employability skills are identified to enable individuals to prove their value to an organisation as the key to job survival.

There are many definitions of the term employability skills. Overtoon (2000) defined employability skills as "*transferable core skill groups that represented essential functional and enabling knowledge, skills, and attitudes required by the 21st century workplace. They are necessary for career success at all levels of employment and for all levels of education.*"

Saterfiel and McLarty (1995) referred the term "employability skills" to those skills required to acquire and retain a job. It is also used to describe the preparation or foundation skills upon which a person must build job-specific skills (unique to specific jobs). Among these foundation skills are those that are related to communications, personal and interpersonal relationships, problem solving, and management of organisational processes. Lankard (1990) cited in Hill and Petty (1995) defined employability skills as those which included personal image, interpersonal skills, and good habits and attitudes. Current thinking has broadened the definition of employability skills to include not only many foundation academic skills, but also a variety of attitudes and habits (Saterfiel and McLarty, 1995).

"Employability skills" is a generic term used to describe the wide range of skills and personal qualities that are sought in new recruits for all occupations by employers in both private business and government. It does not include skills and qualities, which are relevant only to specific occupations (Debling and Behrman, 1996). The British Columbia Employability Skills Board defined employability skills as "*those highly transferable broad-based skills and attitudes that are associated with highly competitive workforces. They are the multipliers that enable individuals to add value and adapt to changing market expectations and opportunities*" (British Columbia Employability Skills Board, 2000).

Overtoon (2000) mentioned two national studies that had become foundational works in identifying employability skills. These were often used as benchmarks or beginning points for other international, national, state, regional, and local studies. One was by the American Society for Training and Development (ASTD), the other was by the Secretary's Commission on Achieving Necessary Skills (SCANS). ASTD emphasised 16 skill groups across all job families:

- Basic competency skills- reading, writing, computation.
- Communication skills- speaking, listening.
- Adaptability skills- problem solving, thinking creatively.
- Developmental skills- self-esteem, motivation and goal-setting, career planning.
- Group effectiveness skills- interpersonal skills, teamwork, negotiation.
- Influencing skills- understanding organisational culture, sharing leadership.

The U.S. Department of Labour, which supported the ASTD study through a grant, had established the Secretary's Commission on Achieving Necessary Skills. The Commission's fundamental purpose was to encourage a high-performance economy characterised by high-skill and high-wage employment. One of the premier studies on

competencies and workplace skills was conducted by the Secretary's Commission on Achieving Necessary Skills (SCANS), to identify the fundamental skills and workplace competencies needed for Americans to succeed in today's and tomorrow's workplace. The findings highlighted 36 skills, including the ability to use five competencies efficiently (resources, interpersonal skills, information, systems, and technology) based on a three-part foundation of basic skills, thinking skills, and personal qualities. The results of the study were published in a document entitled *What Work Requires of Schools: A SCANS Report of America 2000* (1991). According to SCANS, the high performance workplace requires those who have a solid foundation in the basic literacy and computational skills, in the thinking skills necessary to put knowledge to work, and in the personal qualities that make workers dedicated. Further, SCANS states the workplace requires other competencies to manage resources, to acquire and use information, to work productively with others, to master complex systems, and to work with a variety of technologies ("Secretary's Commission on Achieving Necessary Skills (SCANS): Final Report Available," 2000).

A study by the Human Resource Development of Canada and the British Columbia Labour Force Development Board in 1995 (Human Resource Development of Canada, 1996) obtained the views of 195 recruiters representing firms from all sectors of the British Columbia economy. This study investigated the skills and personal qualities sought in new recruits. Small and medium-sized businesses were selected for this British Columbia Employability Skills Project because they represented the majority of business in the British Columbia and because small businesses were experiencing a high growth rate. More than half of the 195 respondents in the survey identified 68 skills and qualities.

Many of the skills and qualities sought by most employers are closely linked to knowing what the business is about and being sensitive to customer needs and expectations. Those skills are in an order which broadly reflects the frequency with which they are selected. They are: knowing the business, exploiting information technology, behaving appropriately, speaking and listening, writing, maintaining personal standards, handling numbers, responding to problems, learning continually, planning, working in a team, using equipment and reading (Human Resource Development of Canada, 1996).

The New York State employer survey of workplace skills was conducted based on the skills identified by the Secretary's Commission on Necessary Skills (SCANS). A comprehensive survey was mailed to a random sample of 6,200 firms across the state of New York. There were 2,712 usable returns or a response rate of 43%. A set of functional, work-based skills was rated for their relevance to the specific work being performed. The survey identified what employees did at work to use and allocate resources, how they used information to make decisions and solve problems, the need for interpersonal skills, the various uses of technology as a tool to accomplish specific job tasks and the need to understand and use a variety of systems (Department of Labour for the New York Association of Training and Employment Professionals, 1995). The results showed a high percentage on foundation skills, which were personal qualities (97%), such as a person that could be trusted, recognised when faced with making honest/dishonest decisions based on values; understood the impact of violating organisational beliefs, and chose an ethical course of action. This was followed by interpersonal skills, such as working cooperatively with others; and basic skills, such as, received, interpreted, and responded appropriately to verbal messages and other clues such as body languages.

2.4 Competencies for Information Professionals

Competencies can have different meanings in everyday, academic and vocational context. Some studies attempt to identify major competencies required in a broad job category such as the study by British Columbia (British Columbia Employability Skills Board, 2000), the New York Employer Survey (Department of Labour for the New York Association of Training and Employment Professionals, 1995), and the SCANS ("Secretary's Commission on Achieving Necessary Skills [SCANS]: Final Report Available," 2000); while some studies focused on a job specific description such as librarian, information or knowledge management practitioners. In many competency studies, differences can be seen whether the study included or excluded personality traits, personal values and styles.

2.4.1 Definitions of Competencies

Competency is defined in the Council of Europe (COE) document as "*the set of knowledge and skills that enable an employee to orientate easily in a working field and to solve problems that are linked with their professional role*" (Webber, 1999). This definition fits well with that provided by the Special Library Associations (SLA) which stresses behaviours as well as skills and knowledge.

Setzer (2001) defined competency as the ability to execute a task in the "real world." A person has competency in some field if he or she has demonstrated through past accomplishments the ability of executing a required task. Competency requires knowledge and a personal ability.

The most popular definition on competency was provided by Griffiths and King (1986) in their report of a study on identifying information professional competencies. They defined competency as generic knowledge, skills or attitude of a person that are

related to effective behaviours as demonstrated in performance. Knowledge here means having information about, knowing, understanding, being acquainted with, being aware of, having experience, or being familiar with something, someone or how to do something. Skills refer to the ability to use one's knowledge effectively. Attitude is the mental or emotional approach to something or someone. These three components: knowledge, skills, and attitudes are categorised into groups that should be understood by educators, employers and information professionals.

According to Griffiths and King, the types of knowledge that were identified as necessary for satisfactory work performance were:

- Basic knowledge in areas such as language, communication, arithmetic operations.
- Subject knowledge in primary subject fields of users served, such as medicine, chemistry, law.
- Library and information science knowledge, such as definitions, structures and formats of information.
- Knowledge about information work environments, such as information community, its participants and their social, economic and technical inter-relationships.
- Knowledge of what work is done, such as the activities required to provide services and produce products.
- Knowing how to do work, such as how to perform various activities, apply techniques, use materials and technology.
- Knowledge of the organisation or user community served, such as the mission, goals and objectives of the user or the organisation, user's information needs and requirements.

Information professionals acquire knowledge largely through formal education or experience, although some knowledge such as specific "how-to" knowledge comes

mostly from training. Other knowledge, such as knowledge of the organisation, is work-related and can only be acquired through on-the-job training or experience. However, the fact that work-related knowledge is important to successful work performance, should be taught as a part of formal education.

Skills are defined as the ability to use one's knowledge effectively. Three kinds of skills necessary to perform information work satisfactorily include:

- Basic skills such as cognitive, communication, analytical.
- Skills related to each specific activity being performed such as negotiation of reference questions, evaluations of search outputs.
- Other skills such as managing time effectively, budgeting and making projections.

Shaughnessy (1992) quoted in Naylor (2000) listed competencies into the three main categories: knowledge, skills, and attitudes. Each category included attributes such as subject expertise, question negotiations, and service orientations. Naylor (2000) also looked at knowledge, skills and attitudes as important components of expertise. When Pralahad and Hamel (1990) quoted in Naylor (2000) defined a core competency as "*an area of specialised expertise that was the result of harmonising complex streams of technology and work activity*," they started with expertise and added that the core competency was the result of harmonising technology and work activity.

For the Schooner Group, a competency is defined as a behaviour or set of behaviours that described excellent performance in a particular work context (e.g., job, role or group of jobs, functions, or whole organisations). These characteristics are applied more and more by organisations because they provided significant help with key problems such as clarifying workforce standards and expectations; aligning individuals, teams, and managers with the organisation's business strategies; creating empowerment, accountability, and alignment of coach, team member, and employer in

performance development (Schooner Group, 2000). For the Schooner Group, competencies included only behaviours that demonstrated excellent performance. Therefore, they did not include knowledge, but included "applied" knowledge or the behavioural application of knowledge that produced success. In addition, competencies included skills and the manifestation of skills that produced success. Finally, competencies were not work motives, but included observable behaviours related to motives.

A competency model is important because it provides a "road map" for the range of behaviours that produce excellent performance. It helps companies "raise the bar" of performance expectation. Team and individuals align their behaviour with key organisational strategies, and each employee understands how to achieve expectations. For an organisation, the benefits of implementing a competency-based approach to developing professionals are:

- Reinforce corporate strategy, culture, and vision.
- Establish expectations for performance excellence, resulting in a systematic approach to professional development, improved job satisfaction, and better employee retention.
- Increase the effectiveness of training and professional development programmes by linking them to the success criteria (behavioural standards of excellence).
- Provide data on development needs that emerge from group and/or organisational composites that are outcomes of multi-rater assessments.
- Provide a framework and language for discussing how to implement and communicate key strategies.
- Provide a common understanding of the scope and requirements of a specific role.

- Provide common, organisation-wide standards for career levels that enable employees to move across business boundaries (Schooner Group, 2000).

2.4.2 Competencies Identification and Validation Studies

A number of competencies studies in the field of library and information studies conducted over the past 20 years based on systematic surveys, have provided a clear picture of employer's expectations on knowledge and skills required of information professionals.

A highly original study was conducted in the United States by Griffiths and King (1986) on the identification and validation of competencies of library and information professionals. The study involved more than a hundred individuals and organisations. The researchers presented sets of competencies in the categories of knowledge, skills and attitudes using both institutional and operational approaches. Competencies were defined according to entry, mid, and senior levels. In this study, a total of 8,800 individual competency statements were identified, described and validated for information professionals working in 12 different work settings. The 12 work settings were as follows: academic library, public library, school library, special library, database producer, database distributor/service, information centre/clearinghouse, records and information manager, archive/museum collection, information analysis centre, information service company, and library system supplier. The list of knowledge, skills and activities were organised by functions within work settings. Validators were asked to specify which competencies they were most qualified to validate (by functions and work settings), and to consider whether that competency (knowledge, skill, attitude) was essential to successful performance of that function. The competencies were further analysed into those that were considered essential versus

desirable (and the degree to which they were), and those that were considered to become more versus less important in the future. A total of 114 organisations and individuals returned 634 validated competency lists. This represented a response rate of 28% for organisations and individuals, and 23% for the listings.

2.4.3 Malaysian and Asian Studies on Competencies

In the ITM-UNESCO Manpower Survey of Libraries, Information Services and Archives in Malaysia, Norma *et al.* (1986) found that a wide variety of information professionals were needed in the market including those with specialisation in computers and usage, automation, system analysis and design, data processing, information technology and records management. As a result of this study, the School of Library and Information Science (now called Faculty of Information Studies) revised its curriculum and offered courses leading to specialisations.

Information is regarded as an important commodity, needed in planning, researching, policy formulating and decision-making. Mohd Sharif and Adnan (1991) reported that information personnel should regard themselves as entrepreneurs who had the ability to think dollars and cents in working with information. From their study, they found that knowledge in management was an essential requirement. Information personnel must be equipped with a sound foundation in business and management concepts, apart from their knowledge of information products and technological applications. They should also possess flexibility in their outlook, so that they could respond to changes in technology and the market environment of the organisation they served. They should be able to help and develop strategies for their organisation, and be able to direct and motivate their subordinates and supervisors. Information professionals had to play an active role in decision-making as most organisations today

practise participative management. The abilities to communicate orally and in writing were a must for information professionals besides being equipped with knowledge of other related areas such as psychology, languages, communications and human relations skills.

Special libraries are facing fundamental changes, which need to redefine the competencies of information professionals. In defining competencies for information professionals in the special library settings, Rehman *et al.* (1997) interviewed 50 top and middle management of the 10 largest special libraries in Malaysia to validate competencies by using a scale for extending coverage. The validated competencies for professionals working in special libraries for knowledge and skills were presented in six categories of foundation, cataloguing, circulation, information services, collection development and serials. It was found that the ability to relate the information facility to the organisational mission and profile, managerial competencies, information technology applications in the organisation, subject expertise, and a heavy emphasis on the information service aspects, to be the most important requirements for future information professionals.

In another study, Rehman *et al.* (1998a) conducted a study to gather data and analyse the perceptions of 148 middle and top management of 30 largest libraries and information organisations in Malaysia on the required competencies needed to perform the various library operations. The study identified deficiencies of the library and information profession as perceived by librarians. The findings revealed that the most significant deficiencies were related to information technology capabilities, management skills, and behavioural aspects. Participants proposed strategies for improving the education and training of librarians. The limitation of the study was that

only entry-level competencies of librarians in the first five years of their practice were looked at and the behavioral components were not included.

As a continuation from the previous study, Rehman *et al.* (1998b) identified sets of foundation competencies applicable in various work settings, which were academic, public and special libraries and operational settings that referred to the functions of cataloguing, circulation, information services, collection development and serials. In this study, they found that an effective and intelligent application of information technology was the top priority. There was a general agreement that a variety of non-traditional media, and new capabilities for resource sharing that had emerged were changing the nature of library operations and services. In preparing for the future information professionals, the core content will be the capabilities pertaining to automation, database skills, development of information systems and utilities, and effective applications of new technology.

Phisalphong (1998) researched on a comparison of the core competencies required of library and information professionals in automated libraries and information brokerage companies in Thailand. In this study, 76 competencies were identified and the questionnaires were sent to two groups, library administrators or librarians who directed leading automated libraries; and managers or supervisors of information brokerage companies or those who directed information companies in Thailand. A sample of 160 individuals was chosen to participate in the survey, of which 124 usable questionnaires were returned. The data from the study revealed that the differences between the two groups were obvious; 55 of the 76 competencies' mean were significantly different at the 0.05 level. It was interesting to note that the information brokerage company group generally expressed a higher rating of the importance of competencies than did the automated library group. However, the findings also

revealed that both groups shared commonality in some of the required competencies, including knowledge of information technology, especially in database management system, and information needs of users. Problem solving, project management, and teamwork skills were also highly required by both groups, as well as having a customer orientation, being dynamic and change oriented, and providing quality and timely service. The outcome also showed that differences did exist between the competencies required of information professionals working in automated libraries and information professionals working in information brokerage companies. The differences included the ranking of the importance of competency items, the levels of importance in competency items in both groups, and also the dimensions that emerged from the factor analysis. The findings suggested that any Library and Information Studies curriculum should be separated into two different majors, one to prepare graduates to work in library settings and another to prepare graduates to work in information brokerage companies.

2.4.4 Information Technology-Related Competencies

Xu and Chen (1999) carried out an investigation to identify knowledge, skills and qualifications, which employers expect of the systems librarians. They investigated 133 job advertisements for systems librarians in *American Libraries* in 1996-1997. Their results showed that the development of local, national and international networking and computers in libraries, and evolution of integrated library systems have great influence on the job duties, requirements and qualifications of systems librarians. However, the degree of influence varied depending on the types of libraries and the levels of automations. It was also found that the responsibility and knowledge requirements for systems librarians were expanding. Employers expected systems librarians to have a

strong computer and network background. Systems librarians were not just technology experts but also managers and coordinators. In addition to managing, implementing and maintaining library systems, they were engaged in more planning, developing, administrating and coordinating activities. More and more systems librarians were involved in managerial responsibilities and human-related duties than purely technical duties. Computer/networked-related technologies such as telecommunications, operating systems and computer applications were the core technical requirements for most positions. Although human-related duties were increasing, special skills such as communications and interpersonal skills were not emphasised by the job advertisements.

Garrod (1998) believed that the digital era requires staff who thrive on change, and who are proactive in terms of both their approach to work and their professional development. When she interviewed senior managers on the issues of information technology skills and knowledge requirements, they expected new information professionals to have basic computer skills, such as familiarity with e-mail and the ability to operate internal systems. Information professionals working in the electronic environment require a balanced combination of knowledge, skills, aptitude and personal qualities. These include:

- A strong foundation in the theory and knowledge of the organisation.
- The ability to use information in multiple formats.
- Ability to think critically, skills in problem solving, curiosity, persistence, confidence, flexibility and the ability to change.
- General managerial ability, good organisational skills, time management, staff supervision, planning and budgeting.

- Excellent communication skills and good interpersonal skills to successfully fulfil liaison and teaching roles.
- Awareness of the role of technology in teaching and learning in the employment institution and the societal context.
- Basic knowledge of the institutional network and the information service infrastructure.
- Ability to use standard software applications, use of in-house systems and electronic information services.

Garrod's interview programme of her research revealed that the organisational culture and structure was the main cause for the unsuccessful implementation and integration of technology. The culture hindered personal growth and librarians were often not allowed to use their initiative or to make an active contribution to the service. Although new staff were confident with information technology, the resistance and hostility from long established members of staff made it difficult for them to use their existing skills.

Zhou (1996) analysed trends in demand for computer-related skills for academic librarians from 1974 to 1994 by means of content analysis of job advertisements. A total of 2,500 advertisements from the years were sampled for this study. The study identified basic computer-related qualifications required for different types of positions and tracked changes in the demand for these qualifications over time. An investigation into the relevance of a variety of computer-related skills to academic library posts yielded important findings. It revealed that for most computer-related skills, the degree of relevance tended to vary from one type of position to another. The qualification most frequently specified in the advertisements of all types of positions was knowledge of, or experience with, automated library systems. The study revealed

that the scope of computer-related skills for academic librarians was increasing as technology and applications develop. As a result, the degree of importance attached to some particular skills at a given time may change, giving way to the latest developments. By examining the frequency of advertisements listing multiple requirements over time, the investigation also found that the majority of the advertisements calling for computer-related skills have changed during the period observed. Instead of asking for one form of skills, advertisers were asking for multiple skills. This change was attributed to developments in electronic publishing and the application of network technology.

At California State University, Long Beach, Khan and Khukalis (1990) studied the relationship that may exist between the education of information system professionals and their job performance. They found that "*both MIS managers and non-managers agreed that non-technical skills are more important than technical skills for higher professional advancements*" but also agreed that certain areas of MIS required technical skills. The results also showed that more than 70% of MIS professionals came from non-computer related fields.

Chu (1990) concluded that the systems librarian would be a very unusual individual to qualify. Besides being a librarian with experience in library automation, the person must also be a software engineer, a hardware specialist, a systems programmer, a telecommunications expert, and an electrical engineer.

Foote (1997) surveyed previous research about systems librarians through analyses of the contents of 107 position announcements, position titles, responsibilities, degree requirements, required skills, reporting lines and salaries of systems librarians of the early to mid 1990s. She found that the systems librarians' responsibilities fell into three broad categories: automation duties, interpersonal duties and non-system duties. It was

found that the most critical skill for a system librarian required in 75% of the positions announced was technological experience ranging from general (experience with integrated library systems) to the specific (knowledge of the UNIX operating systems). Communication skills were required in 57.4% of the announcements. 34.3% of the announcements required interpersonal skills that emphasised demonstrated ability to work with staff and patrons. Listed to be fewer was management/organisational skills which accounted for 33.3% of the announcements. Knowledge of the library's mission and commitment to the library's services were found in 19.4% of the announcements. This study also showed that non-systems duties such as reference, collection development and cataloguing were not likely to be assigned to systems librarians. Unfortunately, her study only focused on academic settings from 1990 to 1994 and it lacked not only an in-depth analysis of job responsibilities but also the required skills.

Woodsworth (1997) stated that basic competencies for every librarian must include having knowledge about the Internet; evaluating and using hardware, software, and networks; and understanding basic computer and information science concepts. Librarians must adapt themselves working with various search strategies, search engines, and emerging standards. They must also be able to lead change within the organisation and within the libraries. Organisations demand librarians having communication skills and understanding of teaching methodologies to empower users, staff, and peers to employ the technology that provides access to information.

Maceviciute's (1998) survey of the labour market for information specialists in Lithuania showed the recruitment rates needed over the next three years and the qualities and skills needed by information specialists. She found that, on a three-point scale, computerised information storage and retrieval as well as traditional information search abilities topped the list of an information specialist's competencies. The ability

to use the computer was highly valued as an attribute of an employee, although it did not outrank such qualities as oral and written communication skills, need for self-improvement, friendliness, and knowledge of the English language. Surprisingly low was the evaluation of managerial knowledge and skills as well as of formal education in any area.

Butcher (1989) presented an employer's list of essential skills and knowledge required of business information professionals. Information professionals were expected to have computing and technical skills so that they were able to use the operating system, utilise the software application or set-up their own online communications. In the business organisation, management skills are found to be vital. Information specialists were expected to know how to supervise lower staff, to delegate tasks, to practise good time management, and to have marketing and public relations skills. Employers appreciate employees' ability to make their own decision and take responsibility even if they are wrong. Good information skills were important for an information specialist and the methods employed to teach business information were also of concern to employers. Knowledge of the business environment and corporate culture covers all aspects of business information. Butcher felt that many new graduates were ill-equipped for their chosen specialisation, lacking both the skills and attitudes that their employers expect of them. She suggested that information schools review the content of their business information courses to consider the real needs of employers.

2.4.5 Communication Skills

In a survey sponsored by the Special Libraries Association, Tees (1986) conducted a survey of 452 special librarians to identify what competencies were required of new

graduates. She found that high on the list were communication skills, reference skills and service attitude. Human interface skills were rated highly. The ability to write well, communicate with staff, speak in public, and work effectively in committees were at the top of the list (80%). Also rated highly was to have librarians with Bachelor's degree and work experience. Having intelligent and dynamic people in the profession was evidently an asset.

A two-round Delphi study was conducted by Friedrich (1985) to determine if the sample population representing both librarians and information scientists would differ in their ratings of the importance of the 34 competencies selected for inclusion in the study. Competency ratings showed a high level of agreement among all participants, whether they were librarians or information scientists. The competencies rated most highly were inter-disciplinary and could be categorised as job "generic" versus job "specific." Ranked most important was the ability to articulate ideas, principles, concepts, and policies clearly, both orally and in writing. The least important were computer-programming skills.

In a research funded by the British Library Research and Innovations Centre, Stenson *et al.* (1999) identified and profiled the skills and competencies needed for first and second jobs in the banking, pharmaceutical and information provision industries. Their findings suggested that at first job level, a mix of interpersonal skills, particularly communication skills, team skills and computer literacy were high on the employers' list of requirements. At second job level, these skills remained a core requirement plus some management skills, which inclined towards business or sector awareness. At first job level, an understanding of library and information issues was expected while information skills together with industry specific knowledge were expected at second level job.

The Centre for Information Research and Training (1999) conducted a research on the retention and mobility of Library and Information Studies (LIS) staff across sectors within the profession. The objective of the research was to analyse skills required for a competent workforce across the LIS sectors. The sectors that were examined were academic, government, public, commercial, industrial, school, further education, medical and voluntary. Interview surveys were carried out with strategic managers and professionals who had crossed sectors and individuals who were "stuck" in a sector. It was found that the common features and important skills at all levels were communication skills (good written and oral communication skills), ability to work with others (team working skills, interpersonal skills, working with external bodies, working with colleagues at all levels), IT skills (good IT skills and Internet skills), self-management skills (planning, organising, prioritisation, ability to work unsupervised), self-motivation (ability to work under pressure), resource management (resource library management, budget management), people management (supervisory skills) and others (ability to work during unsociable hours, adaptability/flexibility, analytical skills, willingness to develop professionally and learn).

Bennett (1999) reported that teamwork ranked near the top of the list of factors that led to management success now and in the future. The leading factor that enhanced management success was the development of excellent skills in oral and written communication. Most colleges of business were placing emphasis in these areas and yet many reports revealed that graduates were not achieving the level in communication needed especially in their writing skills. As information professionals moved into the knowledge age, communication was becoming even more important. Information cannot be synthesised into usable knowledge without excellent communication, and

information professionals must take the lead in seeing that they were highly proficient in this area.

In another study, Young and Lee (1997) investigated the hiring criteria and skills required for information systems graduates from 112 firms comprising corporate consultancies and accounting firms, computer manufacturers, and in-house information system departments. The findings revealed that interpersonal communication skills were important hiring criteria for information systems graduates besides having a sound background in business fundamentals, and an understanding of the types of corporate applications used in the firm they join. There were a high percentage of firms that mentioned the job title "consultant" and this illustrated the growth of the information systems consultancy services. Traditional technical skills, knowledge of client/server development and the ability to work with object-oriented languages are important but the relative importance of technical skills differs from employer to another. In their telephone interviews with respondents, Young and Lee found that written and oral communication skills ranked ahead of self-confidence and problem solving skills. These interpersonal skills were necessary for working in business units, creating usable documentation, and interacting with functional management. Information systems employees could no longer use a technical job function as an excuse for neglecting important interpersonal skills. Internship or other full-time work experience and having practical business experience were also a preference of employers.

Dr. Lynn Howarth, one of the panel members in a discussion in the Canadian Federal Libraries Fall Seminar that addressed the skills and competencies required of the information worker in the digital age, mentioned that being aware of and meeting current core competency requirements highlighted the importance of information workers and this could result in more employment opportunities and more demand for

competent graduates. She further viewed that some core competencies remain intrinsic to the profession and stated that "*communication skills, critical thinking, and judgement will always be necessary but, as information workers adapt to the 'knowledge revolution,' new trends requiring new competencies emerge.*" She further stated that library school graduates needed the flexibility to become information entrepreneurs with strategic sets of skill, which included the ability to analyse and adjust their thinking within a new organisational context (MacLeod, 1999).

Drawing from the list of competencies reported in studies, Stafford and Serban (1990) examined the core list of competencies reference librarians need in an automated environment. These included communication skills (both oral and written), human relations skills, analytical skills, job and personnel flexibility, and patience. Information technology skills were another area of skills needed by reference librarians and these included computer literacy, knowledge of hardware and software, analysis of hardware/software needs, and the ability to read and comprehend technical manuals and instructions. Data retrieval skills and instructional skills are also becoming more important for reference librarians.

In a personal interview with Professor David Arnott (Personal communication, April 5, 2000), who heads the School of Information and Management Systems of Monash University, Australia, he pointed out the importance of interpersonal, communication and teamwork skills for information professionals, especially those who work within the multimedia environment. Multimedia development work, maintaining and designing of website is an area that is becoming more popular among the information professionals and therefore creative thinking and being innovative are added skills required in order to perform in the job.

2.4.6 Management Skills

Cheney *et al.*'s (1990) study provided information and direction regarding the skills needed by current and future information systems professionals. Information was gathered through structured interviews with a total of 83 senior information systems managers who were responsible for planning, training and hiring information systems personnel. The results indicated that senior information systems managers believed that human factors and managerial knowledge, skills, and abilities have and will continue to increase in importance for all information systems workers, particularly project managers. The findings also confirmed the increasing need for personnel with knowledge, skills and attitudes of advanced technologies, such as database management systems and data communication. This suggested an increasing belief of the value of information as a corporate resource. The results suggested that although information system personnel must remain abreast of technological advancements, there is an increasing need for human factors, problem solving, and business-related knowledge, skills and attitudes.

According to Malinconico (1999), the successful implementation of many activities in an organisation requires coordination and the assistance of many others. Librarians are increasingly required to participate in group processes inside and outside the library. They must know how to function within bureaucracies. When dealing with most high-technology projects, it is essential to understand the approval and authorisation processes of bureaucracies. Malinconico also argued that in addition to the present traditional bibliothecal and technical competencies, the librarian will need well-developed communication and problem solving skills and a thorough understanding of management issues, which were not generally stressed in library and information science curricula.

When Dearstyne and Barlow (1999) developed a new curriculum for the University of Maryland College of Library and Information Services in Archives, Records and Information Management, they consulted employees and leaders in the field. Based on the employer's requirements, these knowledge, skills and abilities were injected into the curriculum. Educational preparation must combine technical skills with broader abilities. Information professionals must understand leadership, management, supervision, and team approach to work. The ability to react quickly, solve problems and understand how things really get done in institutional settings were areas that were stressed repeatedly. Communication skills were essential. The information professionals of the future need to be adept analysts, speakers and writers. They need to understand trends and developments in technology, keep up with changes in the field, and need enough expertise to be able to communicate with technology experts.

Stein *et al.* (2000) surveyed and mapped out the organisational skill sets of the information systems, information services and managerial professional within a range of commercial and academic areas. The results of their survey showed that of the 11 organisational skill sets studied, only one was being actively involved with information users. This showed a significant difference (ANOVA) among the three groupings. The analysis of variation (one-way ANOVA), Levene test and Bonferroni test were performed among the three groupings. The systems respondents viewed this organisational skill, "*be actively involved with users from diverse areas of the organisation,*" as the least important compared to the services respondents. This could be interpreted as systems personnel having a focus that relates to the development of the systems and not concerned with the users of the system. The services professional by nature has a customer focus. Another possible explanation is the systems professional not having the interpersonal skills necessary to deal with users in organisations. Of the

possible 33 matches in skill sets only two (information users and quality assurance) showed significant differences.

For information professionals to successfully tackle current and future issues, information managers must be prepared to develop innovative ideas, assume leadership roles, disseminate information broadly, and demonstrate good management practices. This was viewed by Smythe (1999) who further added that successful managers will prepare for new challenges by continuously refining and building skills, knowledge, and abilities in records management and related fields. Key activities included developing ideas and staff skills, leading teams, and communicating broadly. Managerial and administrative skill requirements could not be ignored.

2.4.7 Library and Information-Related Competencies

Buttlar and Du Mont (1989) surveyed 1,415 alumni of the Kent State University School of Library Science of which a total of 666 usable responses were received. The researcher identified 53 library science competencies needed by new graduates and they were asked to rate the competencies in terms of importance. All the librarians ranked knowledge of bibliographic tools as the highest. Librarians with more experience considered skill-oriented competencies (e.g., online searching) less important but they valued communications and human relation skills more highly. None of the librarians ranked research skills as highly important although academic librarians with faculty status are expected to conduct research and publish the results of their work.

The Special Library Association (SLA) in 1996, published a report by Marshall *et al.* (1996) on *Competencies for Special Librarians of the 21st Century*. The Association defined by the Association, "professional competencies" as knowledge of information resources, information access, technology, management, and research and the ability to

use these areas of knowledge as a basis for providing library and information services. "Personal competencies" represent a set of skills, attitudes, and values that enable information professionals to work efficiently, communicate effectively and survive in the new world of work. Marshall *et al.* (1996) highlighted the professional and personal competencies of special librarians to practise the multitude of roles and tasks that they can perform. The professional competencies were:

- Expert knowledge of the content of information resources, including the ability to critically evaluate and filter them.
- Specialised subject knowledge appropriate to the business of the organisation or client.
- Ability to develop and manage convenient, accessible and cost-effective services that were aligned with strategic directions of the organisation.
- Ability to provide excellent instruction and support for library and information service users.
- Ability to assess information needs, and design market value-added information services and products to meet these needs.
- Ability to use appropriate information technology to acquire, organise and disseminate information.
- Ability to use appropriate business and management approaches to communicate the importance of information services to senior management.
- Ability to develop specialised information products for use inside or outside the organisation or by individual clients.
- Ability to evaluate the outcomes of information use and conduct research related to the solutions of important management problems.
- Ability to continually improve information services in response to changing needs.

- Ability to be an effective member of the senior management team and a consultant to the organisation on information issues.

The full report, *Competencies for Special Librarians of the 21st Century* by Barbara Spiegelman (1997) cited in Field (1998) is already being used by some corporate librarians for developing new job descriptions and by others to restructure their performance evaluations. These two publications stressed the need for a basic understanding of the structure, organisation, and validity of knowledge retrieved. They also assumed that professionals would understand the proper role that technology, whether hardware, software, databases or the Internet, should play in providing access to information. The publications also noted that today's professionals work in an environment of continual change and that they must be able to quickly adapt to these changes. Besides identifying professional competencies that one should develop to become successful, the publications identified personal competencies that one should cultivate. These publications provide us with the guidelines that we need to become masters of our information environment (Field, 1998).

The academic library of the future will require certain skills and academic credentials for the new role of the academic librarian who will be called "cyberarians." Morgan (1997) believed that before turning to the particular skills required for the future, it should be stressed that there were key areas of traditional information work where proficiency was required by information professionals regardless of which sector the person was working in. According to Morgan, some of the skills were: identifying and meeting the information needs of the clientele; identifying, accessing, organising, interpreting and evaluating knowledge and information; interpersonal and communication skills; professional development including updating IT-related skills; and generic management skills. Morgan suggested that for these skills to flourish, they

had to be managed in such a way that there was coordination, consistency and continuity. In Morgan's view, it was important for librarians to gain credibility in an educational role so that they would be effectively integrated into the academic community.

In another study, Schlough (1998) mailed 379 respondents who recruited graduates of the University of Wilconsin and 206 usable surveys were returned. The instrument consisted of a list of knowledge and attitudes obtained from literature searches and validated by a panel of experts. The Likert scale was used to determine the optional knowledge, skills and attitudes of new employees who will be hired in five years' time and yes/no questions to determine if employees hired possessed those knowledge, skills and attitudes. The result of the study was the identification of the knowledge, skills and attitudes that were needed to work effectively in a computer supported cooperative work environment.

On the education of information providers, Field (1998) said that schools listened to alumni and employers of their graduates. Educators observed what other schools were doing and then reviewed their curriculum to see if there was a way to address these issues. The schools also tried to ascertain if their current curriculum truly reflected the latest information theory. The scope of these curriculum included recognising the organisation of knowledge, understanding the principles of classification, developing search strategy skills, learning the importance of evaluating all information sources, and determining the needs of their clients. Mastering these knowledge skills was important in developing effective ways to cope with the increasing glut of information sources. It allowed quality information providers to identify, organise, evaluate, synthesise, and deliver accurate, timely and comprehensive information in a format that could be used to make business, scientific, legal, medical, or technical decisions. A quality

programme gave information providers the ability to adapt major changes in the information environment. It allowed them to master the new paradigms that emerged.

Lettis (1999) provided a checklist of specific intellectual and technical competencies that he expected a talented junior level information specialist to have acquired during his/her first or two years of professional experience in either a corporate or a legal information centre. The list included the ability to identify information needs, the ability to apply appropriate methods of research, evaluation and measurement, the ability to formulate complex search strategies, proficiency in using a minimum of eight popular databases, and three Internet and metasearch engines. The ability to add value to raw data through appropriate filtering, synthesising, packaging and presentation of formats was also in the list. Excellent communication skills, including the ability to negotiate and demonstrate effective teamwork among peer professionals and management were also included in the list.

In another personal interview with Associate Professor Barry Mcintyre (Personal communication, April 6, 2000) of the School of Business Information Technology of the RMIT University, Australia, he stressed the importance of skills in knowledge management, business analysis, strategic management and decision-making in relation to business. He added that other competencies that are required are editorial and content management skills besides language and cultural understanding.

2.5 Personality Traits of Information Professionals

2.5.1 Definition of Personality Trait

Personality can be loosely defined as:

- The distinctive and enduring patterns of behaviour and cognition that characterise a person's adept to life.

- An individual's unique and relatively consistent patterns of thinking, feeling, and behaving ("Personality," 2001a).

Allport (1961a) quoted in Mayer and Sutton (1996:5) defined personality as "*the dynamic organisation within the individual of those psychophysical systems that determine his characteristic behaviour and thoughts.*" While Cattell's definition of personality is as follows: "*Personality is that which permits a prediction of what a person will do in a given situation*" (Cloninger, 1996:229). Feist (1994) defined personality as "*a global concept referring to all those relatively permanent traits, dispositions, or characteristics within the individual, which give some degree of consistency to that person's behaviour.*" Cloninger (1996:3) defined personality as "*the underlying causes within the person of individual behaviour and experience.*" Goulding *et al.* (1999a) generalised personality as the combination of a person's actions, thoughts, emotions and motivation as revealed in interactions with others.

Personality has been viewed as the individual's most striking or prominent characteristics. A person may be said to have an "outgoing personality" or a "shy personality," meaning that his or her most distinctive attribute appears to be friendliness or shyness respectively. In this instance, personality refers to the overall social impression that an individual conveys when interacting with others (Hjelle and Ziegler, 1992).

A trait is a relatively permanent disposition of an individual. Traits are inferred from behaviour and are considered to be continuous dimensions on which individual differences can be arranged quantitatively (e.g., extraversion, introversion) ("Personality," 2001b). Allport (1961b) cited in Hjelle and Ziegler (1992:242) defined a trait as "*a neuro-psychic structure having the capacity to render many stimuli functionally equivalent, and to initiate and guide equivalent (meaningfully consistent)*

forms of adaptive and expressive behaviour." In simpler words, a trait is a predisposition to act in the same way in a wide range of situations. Cattell defined a trait as "*that which defines what a person will do when faced with a defined situation*" (Cloninger, 1996:229). Traits are the units of personality that have predictive value. While Guilford defined trait as "*any distinguishable, relatively enduring way in which one individual differs from others*," traits tend to cluster together in various combinations to form "types" of people and this is a useful way of classifying personalities (Cohen and Swerdlik, 1998:14; "The Trait Approach to Personality," 2001). A personality trait is a characteristic that distinguishes one person from another and that causes a person to behave more or less consistently. An individual can be said to have any degree of a trait, from a little to a lot. One person might be very outgoing, extremely confident, and moderately athletic, while another person has different traits. Traits are widely used in everyday descriptions of personality. Different to types, traits cover a narrower scope of behaviour. Traits allow a more precise description of personality than types because each trait refers to a more focused set of characteristics. Personality traits and types allow us to compare one person with another (Cloninger, 1996).

There are two classic studies of traits. One study was done by Gordon Allport (1897-1967). In 1961, Allport (1961a) reviewed nearly 50 definitions of personality. In a dictionary study of personality, he identified 17,953 trait names. Allport accentuated that personality traits exist within an individual and can help explain the consistency in that person's behaviour. There were two types of personality traits put forward by Allport: common traits and personal traits (or personal dispositions). By common traits, Allport meant those dimensions of personality shared to a greater or lesser degree by almost every individual but shared in common with nearly everyone. Aggressiveness

and intelligence are examples of common traits that can be used to make comparisons among people. On the other hand, personal dispositions are traits unique to just some people. An example of a unique disposition is how one displays a sense of humour, like sharp wit, cutting sarcasm, philosophical jokes, and so on ("Trait Approach to Personality," 2001).

Allport classified traits into three groups: cardinal traits, which dominate a person's personality and are not present in all people; central traits, which are the five to ten defining traits of a person such as honest, friendly, neat, outgoing, fair, and kind; and secondary traits, which are the less obvious, more specific tendencies, habits, and attitudes ("Trait Theories- Summary," 2001).

Another classic approach is that of Raymond Cattell (b. 1905). Cattell has an empirical approach, relying on psychological tests, questionnaires, and surveys. Cattell's theory relies heavily on the use of statistical technique of factor analysis, which he used as an important research tool. Cattell reviewed the dictionary and found 4,000 words that described about 171 characteristics of a person. Through factor analysis he eliminated what he considered are redundant and came up with 16 personality factors, the so-called source traits (from which he developed the Sixteen Personality Factor Questionnaire or the 16PF for determining personality) with which all other surface traits correlated. The factor analysis, which is a correlational procedure, identifies groups of highly related variables that may be assumed to measure the same underlying factor (here, a personality trait). The logic is that if you know that some people are outgoing, you don't need to test them to see if they are sociable or extroverted; such information would be redundant. Cattell asserted that traits were the elements of personality. He postulated that there were two major types of personality traits: surface traits and source traits. Surface traits are clusters of behaviours, for

example, those that go together to make up curiosity, trustworthiness, or kindness. These traits are easily recognised and can be seen in many settings. Source traits are the fewer number of underlying traits from which surface traits develop. One's pattern of source traits determines which surface traits get expressed in behaviour. Source traits are not easily measured as surface traits because they are not directly observable. Source traits are revealed through factor analysis in Cattell's system ("Trait Approach to Personality," 2001; Hjelle and Ziegler, 1992)).

Hans Eysenck (b. 1916), who was another factor analytic theorist, believed that biological factors are the personality's main influence. In his study, Eysenck used questionnaires, observations, and physiological measures of personality. He suggested that personality was the interaction of four factors: cognitive, conative (character), affective (temperament), and somatic. He proposed that there were three major dimensions of personality: introversion versus extraversion, neuroticism versus emotional stability, and psychoticism versus impulse control.

Agada *et al.* (1994) cited in Sabatier and Oppenheim (2001) mentioned that one of the most important and the most frequently used personality tests in the study of librarians was the Myers-Briggs Type Indicator.

2.5.2 Traits of Information Professionals

Previous studies had tried to identify the personal qualities that were crucial for success from an employer's view. Such research revealed that information and library employers placed a high value on personal attributes or personality traits.

There was much evidence from the literature that said employers realised the importance of personal qualities when recruiting library and information professionals.

The study by the Secretary's Commissions on Achieving Necessary Skills (SCANS), US Department of Labour identified personal qualities as:

- Responsibility- exerts a high level of effort and perseveres towards goal attainment.
- Self-esteem- believes in own self-worth and maintains a positive view of self.
- Sociability- demonstrates understanding, friendliness, adaptability, empathy, and problems in group settings.
- Self management- assesses self accurately, sets personal goals, monitors progress, and exhibits self-control ("Skills and Competencies Needed to Succeed in Today's Workplace," 2000; "Secretary's Commissions on Achieving Necessary Skills [SCANS]: Final Report Available," 2000).

According to Griffiths and King (1986), attitudes of information professionals are extremely important to work performance. Attitudes are mainly obtained through experience, although proper education and training may alter it. Formal education of any kind should place a value on conveying a sense of professionalism and the importance of attitudes in achieving satisfactory job performance. Griffiths and King further sub-divide attitude into:

- Dispositional attitudes toward one's profession, the organisation served, one's work organisation, and other people such as users and co-workers.
- Personality traits/qualities such as confidence, inquisitiveness, sense of ethics, tenacity.
- Attitudes related to job/work/organisation such as willingness to learn, desire to grow.

For the Special Library Association (Marshall *et al.*, 1996), "personal competencies" represent a set of skills, attitudes, and values that enable information

professionals to work efficiently, communicate effectively, and survive in the new world of work. The personal competencies included in the SLA study are:

- Committed to service excellence.
- Seeks out challenges and opportunities.
- Sees the big picture.
- Looks for partnership and alliances.
- Creates an environment of mutual respect and trust.
- Have effective communication skills.
- Works well with others in a team.
- Provides leadership.
- Plans, prioritises, and focuses on what is critical.
- Committed to lifelong learning and personal career planning.
- Has personal business skills and creates new opportunities.
- Recognises the value of professional networking and solidarity.
- Flexible and positive in a time of continuing change.

In an investigation conducted by Armstrong and Large (1986), they matched the qualities that successful applicants possessed with the criteria applied by British employers in the library and information sector when appointing staff. The sample included the whole range of library and information sectors. Of the total of 643 questionnaires that were mailed, 402 questionnaires were returned. Employers were asked to rank in order of importance, the criteria considered when appointing the successful applicants. The findings revealed a high priority on the personality and attitude of the candidates in comparison with the type of educational qualification and experience that the candidates had. The individual's personality, interview performance and attitude towards the job were identified to be of particular significance in almost all

sectors. More than two-thirds of the employees ranked these as one of their top five criteria. Furthermore, Armstrong and Large conducted a structured telephone interview with senior staff to gather their views on the relative merits of the different kinds of professional education available. Their findings from the 18 telephone interviews had also emphasised that the personality of the candidates was more important than the kind of Library and Information Studies' qualification. In an interview, one public librarian expressed the importance of relevant work experience, personality, attitude and performance during interviews and did not care which library school the person had graduated from or whether the person was a graduate or not.

Tees (1986) received comments from respondents in a survey he conducted among 452 special librarians. They commented that personality was more important than the skills and knowledge that an individual learned in school. Respondents looked for people who are able to work with others, the public, as well as staff, and who exhibited an outgoing personality, flexibility, curiosity, and the attitude of service. "*Emotional maturity... practical intelligence... communication skills... motivation/dedication*" was the way one person put it. Another said, "*Send me an energetic, willing, outgoing (not mousy), and practical information graduate,*" while others commented on the commitment to excellence. Many suggested that graduates must learn on-the-job and must continue their education in order to grow, keep up-to-date and be effective.

Cottam (1987) argued that a successful organisation needs people who are "entrepreneurial" - willing to take hands-on responsibilities for creating innovation of any kind within an organisation and the risks that accompany this. He described the ways in which librarian entrepreneurs would greatly improve the profession in the 21st century with their high level of energy, awareness of responsibility, accountability and self-confidence. The entrepreneur also communicates closely and continually with

deficiencies, innovations, and potential solutions. Reid noted that many librarians have not developed strategies for searching the hidden part of the Internet. As Internet specialists, librarians must be proficient in identifying full-text resources on the Web and conducting web-based research.

Two leading high-technology companies, Microsoft and Digital Equipment, are preparing their library staff for the future. According to Choate (1997), the Microsoft training programme focuses on preparing its information staff for the company's fast-paced and ever-changing business environment. The staff recognises that new technologies and complex pricing schemes demand that they have the technical knowledge required to do thorough evaluations of new technologies and the business acumen to perform complex cost comparisons. Core competencies include basic research abilities, customer service skills, and work flow management.

2.6.2 Roles in Internet and Information Technology

Digital Equipment is also responding to information specialists' changing roles (Kennedy, 1997). The Corporate Library Group at Digital met the challenge of the information explosion with a web-based solution on Digital's Intranet: the Web library. The library staff provide the expertise to carry out the web library's work and to validate the relevancy contents. They evaluate, analyse, synthesise, qualify, and disseminate externally created information ("Value of Information and Information Services," 1999).

Bernbom (2000) addressed the roles of librarian and information technologist as the partnership in information technology and the library. The Internet and networked information resources represent a specific case for convergence of interest for librarians

effectively in teams, collaborate with colleagues, and liase with staff were considered fundamental, the ideal post holder should also know when to take personal responsibility and when to work independently. Good organisational skills were found to be necessary in order to improve the efficiency of procedures that were carried out. Excellent written and oral communication skills were essential requirements, to ensure that information was conveyed clearly and succinctly throughout the organisation. Listening skills were identified as equally important for effectiveness in discussion and committee groups. Other desirable attributes were the ability to recognise errors, learn quickly and reassess progress in a continuous and constructive manner. Judgement was also an important attribute, especially in terms of knowing when to consult others and deciding on which successful decisions should be used as a model for the future. Coutts concluded the person's quality by reinforcing the need within the information service, for people who can supervise and motivate others effectively. This type of a person must be able to plan, delegate, communicate, encourage, negotiate and discipline. The ideal library supervisor was described as assertive yet fair and flexible.

Allen and Allen's (1992) study involved an extensive job advertisement analysis of both academic and public library professional appointments. The advertisement analysis revealed that service orientation was a popular selection criterion: this personality factor was most frequently mentioned as a selection criterion in the advertisements analysed. Service orientation (the disposition to be helpful, thoughtful, considerate and cooperative) was mentioned in 21% of the ads, more than four times as often as any other personality characteristics. The next most frequently requested personality characteristics, each mentioned in 5% of the ads, were flexibility and initiative. Allen and Allen also sent out questionnaires to 120 employers from which 81 were returned. The findings revealed that service orientation along with working well

with people was considered by selectors to be a very important personality characteristic for public services librarians. This supports the validity of the previous advertisement content analysis findings.

Miller (1994:258) identified the competencies for intelligent professionals from personal experience and literature, as well as from practising professionals as follows:

- Traits: creativity, persistence, written and oral communication skills, analytical ability, understanding of scientific methodology, independent learning skills, and business savvy.
- Teachable skills: strategic thinking, business terminology, market research and presentation skills, knowledge of primary information sources and research methods, enhancement of journalistic interviewing and communication skills, analytical ability, and an appreciation of scientific methodology.
- Professional experience: knowledge of corporate power structures and decision-making processes, industry knowledge, enhancement of primary research skills, business savvy, and journalistic interviewing and observational skills.
- Mentoring: creativity, persistence, strategic thinking, and business terminology, enhancement of communication skills and research skills.

However, according to Miller, there are those who can conduct research but cannot communicate effectively. Therefore, the trait, course work, experience, and mentoring sequence are inappropriate and therefore, practising intelligent professionals need to complete a few courses to update or expand their skills.

When Buttlar and Du Mont (1996) studied the attitudes of library schools alumni concerning the value or usefulness of various competencies for inclusion in the Master in Library Science programme, he concluded that concentrating on technical skills alone was not enough. Employees must also have the sense of commitment at their work

place. He commented that personality characteristics such as having the "growth need strength" were especially important. Employers demanded employees to be engaged in continuous learning, decision-making, and assuming responsibility for organisational structure, functioning, and performance. He viewed those employees who had no desire to learn and only preferred narrowly defined skill-oriented jobs as misfits in a dynamic workplace.

Finlay and Finlay (1996) studied 101 librarians on the relative roles of knowledge and innovativeness in determining the librarians' attitudes towards and use of the Internet. The study revealed that those high in the personality trait innovativeness (being positively predisposed towards novel stimuli) tend to hold more positive attitudes towards the Internet, regardless of knowledge level. Librarians high in knowledge and having a stronger predisposition toward searching for and processing information when tasks are performed on the Internet, are related to higher overall attitudes towards the Internet. The study confirmed that a supportive environment (an encouraging supervisor and sufficient opportunity to learn to use the Internet) was also important to enhance use of the Internet. It also pointed out that besides knowledge there must also be a keenness to learn to use the Internet to meet customer requirements.

According to Morgan (1997), employers and Library Schools have a responsibility to ensure that entrants to the profession possess the appropriate personal qualities. When such qualities are accompanied by effective interpersonal skills, in particular, communication skills and creditability are enhanced. The librarian who is positive, highly motivated and assertive is likely to foster more productive relationships with academic staff and give them confidence in their abilities. Effective librarians will not allow themselves to be intimidated.

Rice-Lively and Racine (1997) explored the role of information professionals in academic settings. They found that the fundamental tasks were to determine the information needs of users and then link the users with resources that will meet their needs. This implies an increased focus on the user, so the information professional must take on the roles of translator, guide and teacher to whom communication and judgement skills are essential. Flexibility and creativity in information seeking habits and the ability to evaluate and critically interpret information resources were also found to be important requirements for the new information professional. In order for these qualities to be promoted, Rice-Lively and Racine recommended that LIS education must develop students' critical reflective thinking.

When Garrod (1998) evaluated the impact of information technology on the skills and roles of staff working in the library and information services, the findings showed that employees' personal qualities such as flexibility, confidence, and interpersonal skills were keys to their success in the networked environment. The conclusion of the research gave credit to the importance of information technology skills, emphasised that these could easily be acquired if staff had the desired personal qualities and work in an environment that supported this personal development. Garrod viewed that today's information professional, working in the electronic information environment, required a balanced combination of knowledge, skills, aptitudes and personal qualities. On the personal qualities, she included: critical thinking ability, skills in problem solving, curiosity, persistence, confidence, flexibility, and ability to adapt to change; general managerial ability, good organisational skills, time management, staff supervision, planning and budgeting; excellent communication skills and good interpersonal skills toward successful liaison and teaching roles. Garrod believed that future information

professionals need to be outgoing, self-motivated, able to learn quickly and be receptive to new ideas.

According to Bender (1998), one of the most critical elements of success is attitude. Information professionals must embody commitment to service excellence, life-long learning, and actively seek challenges, opportunities and professional alliances.

When asked what competencies, knowledge and practical skills were require, Lettis (1999) gave tremendous weight to personal characteristics such as overall attitude, approach to problem-solving, work ethics, commitment to quality, politically savvy, ability to be a team player and above all else, dedication to the principles of providing first-rate customer service. Lettis, in drawing a list of specific intellectual and technical competencies, expected a talented junior information specialist to have acquired in their first year or two of professional experience (in either a corporate or legal information centre), excellent communication skills and teamwork skills.

Two recent studies identified the personalities and competencies that were most prevalent among Chief Knowledge Officers (CKO) (Duffy, 1998) and these were the abilities to energise the organisation, have vision, have change management skills and strong interpersonal skills to spread the KM knowledge throughout the company.

In another research on the personality trait of the CKO, it was found that although the people came from various backgrounds and were working in all sorts of different corporations, they were remarkably similar in terms of types of people that they were (Duffy, 1998). Concerning the personalities of the CKO: "*They tended to be outgoing, extroverted, persuasive, passionate, articulate, committed and at the same time exhibited a lot of personality traits that are commonly associated with high-achievement people*" (Duffy, 1998:3).

Goulding *et al.* (1999a, 1999b) compared the personal qualities demanded by employers with the actual attributes of Information and Library Studies (ILS). She surveyed 888 chief librarians across the UK and found that employers across sectors identified the ability to accept pressure, deal with a range of users and responded to change, as most essential for information work. To find the actual attribute of ILS students, a personality assessment using Cattell's Sixteen Personality Factors (16PF) was used to test the personality profiles of 239 ILS students from four universities across the UK. It was discovered that there were gender and graduate status differences in emotional stability, dominance, self-sufficiency and social awareness. It was concluded that there was evidence of a mismatch between employer requirements and expectations of the attributes and attitudes displayed by ILS students.

A study by Phisalphong (1998) found that the required attitudes for information professionals in libraries and companies included being customer service oriented, providing quality and timely services, and being courteous and friendly. Being dynamic and change oriented were also highly required of both groups because rapid changes in information technology had altered the activities of information professionals and also the functions of information providers. Hence, information professionals must be flexible, dynamic, change oriented and enthusiastic to learn new things.

Wilson (1997) believed that in selecting candidates for the LIS profession, imagination is the key to all intellectual developments and all intellectual activities. In addition to that they need intellectual capability, to be intelligent, and to be sharp, bright people. He further added that:

> "...strong motivation to work in the area, enthusiasm for the notion of information service, an interest in and eagerness to work with people and to interact effectively with people, both as members of teams and as people serving other people: information service and librarianship have always been service occupations and

therefore the ethos of service is very important."

2.6 Roles for Future Information Professionals

Dosa (1985) noted that a professional role includes an attitude, an approach, a way of thinking and a vision of the world. It was a result of society's needs combined with individual inventiveness. It represented the professional's theoretical preparedness, ethical value system and set of skills. At its best, a professional role formed a bridge between tradition and change.

2.6.1 Roles as Trainers

Reid (1998a) mentioned that librarians have been on the forefront of technological developments that supported proficient use of information. With the rapid pace of technological innovations, they are starting to expand their roles to trainers and technology liaisons/coordinators. They are analysing the technological needs of clients, monitoring the emerging services, evaluating performance of the technologies and integrating relevant technologies into the library's operations. With further implementation of smart city projects, librarians will become more involved in their organisational's corporate-wide Intranet teams, community outreach projects, outsourcing services, distance education projects, knowledge management projects, information entrepreneurship, lifelong learning projects, and business intelligence ventures. To assume these emerging roles, they must continue to participate in leading-edge training programmes, conferences and innovative projects.

Reid (1998b) wrote that with rapid technological developments, librarians must continue to expand their roles to become technology liaison or coordinators. They must continue to anticipate the technological needs of clients; they must monitor, evaluate, and integrate relevant emerging technologies. They must also tract technological gaps,

deficiencies, innovations, and potential solutions. Reid noted that many librarians have not developed strategies for searching the hidden part of the Internet. As Internet specialists, librarians must be proficient in identifying full-text resources on the Web and conducting web-based research.

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and technologists. Librarians and technologists will influence future advances towards a global digital library. The areas in which the two professions can work together are:

- Discovery and retrieval: Search engines and algorithms, search strategies and goal-directed information behaviour.
- Content evaluation and description: standards and metadata.
- Content evaluation and assurance of quality: collection development, content selection activities.
- Labelling: classification and authenticating information (quality) to attest to its accuracy.

During the 62nd IFLA General Conference, Rusch-Feja (1996) informed that as a result of the integration of networking technology, the librarian might be called upon to create new network services for both internal and external use. These could include making current content services available (both from external sources or based on internal journal holdings), making the library OPAC workable for access via the Internet, contributing to the creation of a Web-presence of the home institution on the Internet, providing value-added services to select, compiling and structuring relevant accession points in the Internet for researchers' specialisation, and developing search mechanisms and training materials to support researchers in their use of these new information sources. In addition, with the introduction of new technology, the librarian will function as systems designer. Innovative value-added services based on new technology will be integrated into the electronic environment. These included the creation of meta-databases for both print and digitally-based information sources for retrieval purposes at different user levels, integrating Web oriented quality management software such as link-checkers, security systems to protect externally offered servers

and internal information, adapting Z39.50 or other automated indexing and retrieval "robots" to make the library database available on the Internet.

Bender (1998) suggested that today's information professionals be technological savvy and use the latest information technology to proactively gather, analyse and disseminate knowledge for strategic decision-making. Special librarians are dynamic and change-oriented information professionals and they are recognised as a valuable part of knowledge-based organisations. They are able to find the best resources for information, then organise, package, and deliver information in a way that maximises its usefulness. Bender further said that the new information professionals must constantly build their knowledge and skills to keep up with these shifts. To successfully accomplish these new functions, competencies that encompass knowledge, understanding, skills, and attitudes must be nurtured and harnessed.

Gates, the Chairman and CEO of Microsoft Corporation commented that one of the biggest businesses on the Web would be information about information (metadata). Great thesauri, indices, and catalogues are important contributions to making the Web truly useful. Multimedia catalogues with extremely detailed content will evolve to help people find things. The organisation of information and issues in information retrieval are hugely important on the Web ("A Conversation with Bill Gates,"1997:24)

Moore (1998) identified vital and continuing roles for information professionals as the creators, communicators and consolidators of information. To compete successfully with other groups, information professionals must be proactive and creative in fulfilling their new roles. The creators are the ones who develop and produce information products and services. They need to understand the technology so that they can exploit its potential. They need the skills of navigation. The creators also need to be skilled in the complex set of processes associated with information system and design. They will

need to understand how language works and how to use layout, typography and design principles to achieve the desired impact. The collectors build collections of information in anticipation of the future. The collectors need to select the items that add the most value, acquire and organise them (for easy access). Communicators provide information services on demand. The communicators need a high level of inter-personal skills. The consolidators act as the filters and the researchers, working as part of the management team. The consolidators need a high level of skills in the analysis and synthesis of information. They need to be able to interpret the information in the light of circumstances faced by the organisation for which they work.

Newton and Dixon (1999) examined the impact of rapidly changing information and communication technology on the information profession. It identified the roles required of information professionals within an environment radically changed not only by new technology but also by shifting organisational structures and objectives and broad economic and political transformation.

Bennett (1999) viewed that information professionals in the future must continue to have an eclectic background as well as highly specialised knowledge and expertise. These include:

- A clear perception of the impact of the information age on a rapidly changing world.
- Knowledge of the functional areas of a business organisation.
- A strong view of organisational behaviour.
- Excellent communication skills.
- A specialised understanding of the basic fundamental concepts of information management that may be applied to information created in any medium.
- A mastery of computer applications with a clear perception of the impact of the computer in the future.

According to Deschamps (2000), the future professional model for the digital sector will be a kind of interface manager who has the responsibility for coordinating different stages in the production chain from the idea to the product. They will be information specialists with knowledge of multimedia design: the graphic design for all kinds of digital products, computer graphics and animations, and multimedia presentation and usage. The other one is a role as multimedia project manager responsible for the administration and coordination of the resources involved in their production. They are also the creative content providers, multimedia developers and the content coordinators, analysing the cultural messages and communicative effects. They are also the systems analysts, and the information economists who work under that category. The new information professional must be able to acquire and process, mediate and market information products, process and disseminate information, have market and service-oriented work attitudes, and evaluate appropriate services and products.

Griffith (2000) indicated that librarians are now being asked to make radical changes to the way they work such as working in teams, considering and meeting client needs, learning to communicate with information technologists, implementing business practices such as long range and yearly planning, being accountable for implementing those plans, changing long instilled work practices and keeping one's eye on the big picture. Griffith pointed out the five characteristics as being the key to professional success. One is the ability to guide in the face of an uncertain future. Griffith stressed that the dramatic changes in Internet technologies means that information professionals need to be pioneers of new knowledge frontiers, become the physical guide, the procedural guides and the intellectual guides to knowledge resources in various formats. The second characteristic of the new information professional is being able to collaborate with others, with familiar or unfamiliar people or remote users. The third

characteristic is to be a juggler of priorities. The new information professional needs to be flexible in procedures, structures, and directions; and also needs to be agile and responsive to changing needs, strategies, architectures, technologies and leaderships. Empowering people is the fourth characteristic that involves recognising what it takes to empower and what it takes to be empowered. The last characteristic mentioned by Griffith is that, the information professional needs to understand the core capabilities of their organisations from capabilities of the entire organisation to the units within which they work, to those of individual staff members. The role of the information professional is at the heart of all these critical activities- technology development, technology applications, content development, new ways of thinking about things, new ways of doing work, new ways of collaborating. The information professional has to take the role of leader and guide. Information management is a vital part of everything the organisation does.

2.6.3 Roles in Information Management

Rehman (2000) noted that a new role of library professional is not just physical handling of information artifacts, but the role of information management. Wilson (1997) emphasised on the diversity of roles among information professionals. A library will have a systems person to manage the computer systems, somebody with telecommunications competencies to manage the telecommunications systems, while there will still be need of all the people doing information handling activities. He believed that what will be needed in the future is a diversity of people filling a diversity of roles rather than the rounded professional person who can do it all. In other words, he disagreed with multi-tasking. Wilson suggested that there should be a variety of different education institutions preparing different kinds of information professionals.

Some will be based in computer science departments or information systems departments and their orientation will be to the hardware, the telecommunication protocols, the software systems and perhaps to an increasing degree the organisational aspects of information management. There will be those in business schools who emphasise on business information systems, where a lot of attention will be paid to the management of internal information resources in the way of production data, personal records; in competitive environment scanning of the markets on those kinds of things.

2.6.4 Roles in Knowledge Management

Talking on the roles of knowledge professionals for knowledge management, Kim (1999) said that librarians have long been regarded as part of the support staff of the organisation, working quietly in the background, and often uninvolved in any of the critical functions of the organisation. Information professionals have to recast their roles as knowledge professionals. In other words, librarians have to work as knowledge workers. Knowledge work is characterised by variety and exception rather than routine, and is performed by professionals or technical workers with a high level of skills and expertise. Those who exercise their intellect in any of these types of activities are knowledge workers. Knowledge professionals should be able to extract, filter and disseminate vital external knowledge. They will also design and develop workgroup application suits that are effective platforms for knowledge management. They will work side-by-side with users in collecting and analysing strategic intelligence, and to act as trainers and consultants who transfer knowledge gathering and research skills throughout the organisation.

Ryan (1998) noted that corporate librarians are ideally placed to take a leading role in the adoption, development and maintenance of knowledge management initiatives.

Librarians use information technology to solve people-related problems at user-dictated speeds. The key knowledge management technique for librarians is the corporate Intranet. Librarians can use external knowledge to catalyse the recording transfer of tacit knowledge from the heads of expert knowledge workers into explicit knowledge for the continuing use of fellow knowledge workers.

Guns (1998) viewed the role of information professional as the Chief Knowledge Officer (CKO) who acts as the strategic facilitator: assembling the knowledge team, then assisting in crafting the strategy, and overseeing the competency project team who implement it. The competencies of the CKO include interpersonal skills, passionate, visionary leadership, business acumen, and strategic thinking skills. They also need to be effective in helping a team mature. Implicit knowledge, hidden intellectual assets, and unstated competencies must be clarified, and managed through a strategic plan that focuses on leveraging these assets for competitive advantage.

In his report *The Chief Knowledge Officer's Role: Challenges and Competencies*, Bob Guns (cited in Duffy, 1998) laid out some basic challenges that face today's CKOs. The roles that CKOs have to face are:

- To set knowledge management strategic priorities.
- To establish a knowledge database of best practices.
- To gain commitment of senior executives to support a learning environment.
- To teach information seekers how to ask better and smarter questions of their intelligence resources.
- To create a place to process and manage intellectual assets.
- To obtain customer satisfaction information in real-time.
- To globalise knowledge management.

According to DiMattia and Oder (1997) knowledge management activities are perfectly done by librarians. The basic elements include accessing, evaluating, managing, organising, filtering, and distributing information in a manner that is useful to end-users. Knowledge management involves blending a company's internal and external information and turning it into actionable knowledge via a technology platform. Librarians need to form partner with other units of the organisation on a knowledge management team, to play a valuable role in the process, and potentially rise in their company's knowledge management hierarchy, as a few librarians already have done. Knowledge management is a new name for what librarians have been doing for years.

Corcoran (1997) viewed that the role of the Chief Knowledge Officer (CKO) is fit for librarians. Davenport (1996) mentioned that the CKO is often involved in overseeing efforts to use technology to capture and distribute knowledge. A good CKO should combine an orientation to structured, explicit knowledge with an intuitive feel for precisely how cultural and behavioural factors may impede or enable the leveraging of knowledge in an enterprise. Further, Davenport noted three critical responsibilities of a CKO which are: creating knowledge management infrastructure, building a knowledge culture and making them all pay-off.

However, Davenport (1996) felt that a well-rounded person is not easy to find. He believed that the role of the CKO requires a combination of "hard" elements (structured knowledge, technology and tangible benefits) with "softer" traits (a sure sense of the cultural, political and personal aspects of knowledge). He stated that, "*obviously, it's not easy to find all of these in one person; being well-rounded isn't within everyone's reach.*"

2.6.5 New Titles for Information Professionals

Elkin (2000) highlighted that the role of information professionals needs to change. Various titles suggested are information or knowledge navigators. The role of information professionals as handlers and managers of information; as trainers of others to use information effectively and efficiently, as evaluators of information quality and information provision, as carers for users, become critical. The newly changed role needs flexible, adaptable individuals who can manage change innovatively, imaginatively and proactively, recognising new opportunities and grasping new challenges. This will require well-educated professionals, constantly developing through a varied programme of continuing professional and personal development.

Rusch-Feja (1996) mentioned that new technology is causing the role of the librarian to be partially redefined as network specialist, information broker, and systems designer. Its overall intensification of specialisation both in the technological aspects of information retrieval work, as well as stronger subject-oriented competencies and evaluative abilities are being demanded of information professionals.

The emergence of the intelligent enterprise and the ascendancy of knowledge workers as the creators of wealth offer librarians the opportunity to reinvent themselves as value-adding professionals. There is opportunity for librarians to transform themselves into highly paid knowledge workers. A knowledge navigator could be compared to a spider at the centre of a gigantic "knowledge" web. Electronic networking with customers (internal and external), subject experts, knowledge bases, etc., will form the core of the knowledge navigator's virtual activities. To be successful, a knowledge navigator must proactively seek involvement in the organisation, and make knowledge creation and management an integrated part of the business process (Chase, 1998).

According to Lank (1998), information professionals will reflect new roles as Information Service Providers, Web Masters, Knowledge Facilitators, and Knowledge Owners. Their role will focus on the value of knowledge assets within the organisation. The Information Service Provider helps people connect with information, which helps them connect with the right people. They ensure that the information is up-to-date, relevant and easy to navigate. The Web Master maintains the technical infrastructure on which shared information flows and ensures people have access to the information via technology tools. The Knowledge Facilitator (or sometimes called the Knowledge Manager) facilitates the process of turning tacit knowledge into explicit information that can be shared, while the Knowledge Owner is responsible for ensuring that the shared information he or she made available is kept up-to-date and accurate.

Bergeron, mentioned in MacLeod (2000), outlined the other roles for information professionals. She spoke of business intelligence specialists; Internet and Intranet Webmasters and information- industry work such as market development, sales and customer support of information services and products. She observed that if information professionals committed themselves to continuous learning and are willing to work outside traditional milieus, and demonstrated leadership in the charting of new territories for knowledge workers, the future holds great promise for them.

There are many knowledge management jobs available and they are filled with workers from a variety of backgrounds. Davenport and Prusak (1998) quoted in Burns (1999:29) argued on the relevance of "librarians" to the new knowledge jobs with job titles like Knowledge Integrators, Librarians, Synthesisers, Reporters and Editors. Says Burns:

> "We have already seen a new breed of professionals, the "webmaster" emerging, its ranks filled by professionals from a wide variety of backgrounds. The strategic generalist, who combines "soft" cultural skills and "hard" technical ones may be the heir to the throne in these changing times."

Many leading international companies like Arthur Andersen and the United Technologies Corporation are transforming information professionals into knowledge managers. At Arthur Andersen, the emerging roles of these knowledge professionals include technology expert, cataloguer/archivist, guide, scout, research librarian, analyst and debriefer.

The United Technologies Corporation library initiated a radical redefining of its roles and services. They are now information managers, research analysts, and knowledge facilitators. Information managers have moved closer to the users and provided "one-stop" information services. The research analysts offer their skills to specific groups and departments, including support of strategic planning, engineering, financial, and technical projects. Knowledge facilitators provide reference services to employees world-wide, supporting them with documentation, coordinating and integrating desktop access to internal and external resources via the Internet (Chase, 1998).

David Skyrme and Debra Amidon, authors of *Creating the Knowledge-based Business*, have created their own lists of roles for knowledge professionals based on their observations of the new knowledge-intensive organisation: knowledge engineer, knowledge editor, knowledge analyst, knowledge navigator, knowledge gate-keeper, knowledge broker, and knowledge asset manager (Chase, 1998).

2.7 Conclusion

The literature review had identified several important studies on the competencies and personal qualities of information professional that stretch from 1985 to the present date. These include definitions of information professionals; employability skills,

competencies and personality traits of information professionals; and issues on roles for future information professionals. Table 2.1 summarises the literature review.

Table 2.1
Summary of Literature Review

Areas of Competencies Studies	Author/Year	Findings
Information-technology related	Zhou (1996), Foote (1997), Morgan (1997), Norma *et al.* (1986), Chu (1990), Cheney *et al.* (1990), Rehman *et al.* (1998b), Xu & Chen (1999) Stenson *et al.* (1999)	IT skills are important for IPs.
	CIRT (1999)	Skills in using Internet technologies are important.
	Garrod (1998), Zhou (1996), Phisalphong (1997), Stafford & Serban (1990), Maceviciute (1998)	Knowledge of basic computer technologies are highly required.
Multimedia- related	Abell & Oxbrow (2001), Morris (2001)	Creative skills and use of graphic software are important skills.
Knowledge management	TPFL (1999)	Knowledge management skills are important.
	Kalseth (2000)	Ability to manage value-added information for strategic decision making.
	Marshall *et al.* (1996), Rehman (1997)	Information-related competencies are important.
Management	Xu & Chen (1996), Mohd Sharif & Adnan (1991), CIRT (1999)	Management skills are important.
	Phisalphong (1998), Cheney *et al.* (1990)	Ability to solve problems is important.
Interpersonal and communication	Tees (1989), Morgan (1997), Bennett (1999), Friedrich (1985), Stafford & Serban (1990), Mohd Sharif & Adnan (1991), Stenson *et al.* (1999)	Communication skills are important for IPs
	Young & Lee (1997)	Interpersonal and communication skills are important hiring criteria.

Table 2.1, continued

Entrepreneurial	Cheney *et al.* (1990), Young & Lee (1997), Marshall *et al.* (1996)	Business analysis skills are important.
	Cheney *et al.* (1990)	Business-related knowledge is needed.
Research	Phisalphong (1998)	Ability to communicate research findings is highly required.
	Kalseth (2000)	Ability to manage value-added information for strategic decision making is important.
Personal qualities	Goulding *et al.* (1999)	Employers demanded information professionals with ability to accept pressure, deal with a range of users and responded to change.
	Allens & Allens (1992)	Personality factor was most frequently mentioned as a selection criteria.
	Garrod (1998)	IP should have a balance of combination of knowledge, skills, aptitude and personal qualities. IPs need to be outgoing, self-motivated and receptive to new ideas.
	Tees (1986), Armstrong & Large (1986)	Personality was more important than skills and knowledge.
	Butlar & DuMont (1996), Xu & Chen (1999)	Responsible and reliable is an important trait.
	Raddon & Abell (1999), CIRT (1998), Phisalphong (1998), Marshall *et al.* (1999), Stenson *et al.* (1999), Allen & Allen (1992), Tees (1986)	Works well with others in a team is highly required.
	CIRT (1999)	Self-motivation is an important trait.
	Finlay & Finlay (1996)	IPs who are innovative have positive attitudes toward Internet.
	Rice-Lively and Racine (1997)	Flexibility and creativity in information seeking habits are important.
	Marshall *et al.* (1996)	Sees the big picture is a required personal quality.
	Phisalphong (1998)	Friendly, flexible, dynamic is a required attitude

Note: IPs = Information Professionals

Most studies on competencies have focused on information professionals with the required skills on information technology, communication, and management (e.g., Zhou, 1996; Garrod, 1998; Xu and Chen, 1999; Stenson *et al.*, 1999; CIRT, 1999) but lesser emphasis on entrepreneurship and research (e.g., Cheney *et al.*, 1990; Young and Lee, 1997). Very few studies have investigated the required skills and competencies on knowledge management and the multimedia-related (e.g., TPFL, 1999; Kalseth, 2000). Therefore, the present research attempts to include the required knowledge management and the multimedia-related competencies of information professionals in the study.

The studies also have had diverse findings. Most of the studies on competencies have highlighted communication skills (e.g., Friedrich, 1985; Tees, 1989; Chu, 1990; Cheney *et al.* 1990; Stafford and Serban, 1990; Mohd Sharif and Adnan, 1991; Morgan, 1997; Young and Lee, 1997; Bennett, 1999; Stenson *et al.*, 1999) and information technology-related skills (e.g., Chu, 1990; Cheney, *et al.*, 1990; Stafford and Serban, 1990; Zhou, 1996; Foote, 1997; Phisalphong, 1997; Morgan, 1997; Maceviciute, 1998; Garrod, 1998; Rehman *et al.*, 1998b; Xu and Chen, 1999; Stenson *et al.*, 1999; CIRT 1999) as important skills that employers required from the information professionals.

Previous studies on relationships between personal qualities and competencies were scarce. Only few studies were found to relate personality traits and competencies (e.g., Finlay and Finlay, 1991; Garrod, 1998). The present study aims to investigate the relationship between competencies and personal qualities of information professionals working within the environment of the MSC status companies.

A number of previous studies indicated that having technical skills among information professionals was not enough, and personality characteristics were found to be important (e.g., Griffith and Kings, 1986; Butlar and DuMont, 1996). Information professionals should have a balance of knowledge, skills, aptitude and personal qualities

(Garrod, 1998). Personality was more important than skills and knowledge (Tees, 1986). As such, the questionnaire developed for the present study had included personal qualities as an important variable.

Few studies, such as the Special Library Association (Marshall *et al.*, 1996) had mixed competencies and personal qualities in one section. The study seemed to mix skills (such as communication skills) and attitudes in their studies. In the present study, the researcher separated competencies and personal competencies into different sections.

The study by the Special Library Association had also included "effective communication skills" and "works well with others in a team" as personal competencies. As such, the present study also included communication skills as a variable under the personal qualities section in the development of the questionnaire.

Most of the previous studies used the survey method. The survey instruments used were questionnaires although a few studies had attempted to collect data through interviews. Descriptive analysis using mean ranking was used to obtain the rank order of the variables investigated. Only one study (i.e., Phisalphong, 1997) performed factor analysis on the variables in the questionnaire.

It is evident from the literature examined that no previous studies produced a conceptual model of competencies and personal qualities that employers required from the information professionals. This study attempts to fill the gap of this lack of a conceptual model of competencies and personal qualities for information professionals.

From the literature reported, it is evident that there are still unanswered issues that can lead to a further investigation in this area. Studies on competencies required of information professionals by employers in the Malaysian context were not many. This study is an attempt to fill in the gap.

Although the issues of MSC were included in the literature review, no studies could be located on competencies and personal qualities of information professionals of the MSC status companies. Most of the studies are on library and information settings. As such, resources for guidance to the present study were limited. Therefore, the present study is an attempt to fill in the gap. This is an exploratory study that will identify the competencies and personal qualities of information professionals required by employers of the MSC status companies. The methodology used to carry out this study is described in Chapter 3.