Chapter 1

INTRODUCTION

1.1 Background

The ALA (American Library Association) Glossary of Library and Information Sciences (1983) defines serials as :

> " a publication issued in successive parts, usually at regular intervals and, as a rule, intended to be continued indefinitely. Serials include periodicals, annuals (reports, yearbooks, etc.) and memoirs, proceedings, and transactions of societies".

This study focuses on a type of serial, that is, journals. In this study, the term journals will be used because it represents "a periodical publication especially dealing with matters of current interest and is often used for official or semi-official publications of special groups" (Evans, 1995, p.186). Journals play an important role in academic libraries especially scholarly journals in the field of science, technology and medicine. A scholarly journal is expected to publish works based on the application of appropriate research methods acceptable to the research community it serves. The need of scientists to communicate their discoveries and observations had led to voluminous correspondence, which later gave birth to journals. Since the 17th century, there has been an enormous and steady growth in the number of serials published (Subramanyam, 1979).

1.2 Growth of Journals

The growth of journals has proliferated tremendously from 2 journals in 1665 to an estimated number of about 350,000 titles today (Sen and Maskhuri, 1997). In the 19th and 20th century, the number of specialised journals started to pick up and has grown to astronomical proportions. From 1800 to 1900 a total of 10,000 periodicals were published but the same number appeared in less than ten years between 1953 and 1963. Hence, it is very clear that the proliferation of such learned periodicals all over the world has indeed grown tremendously (Table 1.1).

Table 1.1 : Growth of Scientific Periodicals

Year	Number	Remarks
1665	2	
1800	100	
1900	10,000	
1925/ 27	25,000	Current and ceased
1934	36,000	Current and ceased
1953	50,000	Current and ceased
1963	60,000	Current and ceased
1963	35,000 ±10 %	Current
1973	50,000	Current

Source: Sen and Mashkuri (1997). The ever widening gap. *University News*, 35: 8, 11

According to the *International Serials Data Systems*, it was estimated that over 350, 000 serial titles were published by 183 countries worldwide by the end of the 1980's (Md. Sidin, 1997). The historical development of the learned periodicals took the world by storm over a period of three centuries. This is clearly indicated by Table 1.1, which shows a humble beginning of 2 journals in 1665, to more than 50, 000

titles presently. This indicates that the various learned associations or societies are still publishing many scholarly journals all over the world in their pursuits of knowledge pertaining to the various disciplines. This enormous growth is greater in this century of the Information Age as journals become a primary source and will always be the most important channel for the formal, public and orderly channel of communication in the field of STM (science, technology and medicine). Lim (1990) stressed on the importance of information as an economic resource as researchers need current information in their fields to perform successfully and to extend the frontiers of knowledge. Such explosion of information has been posing more of a challenge to libraries than any other phenomenon. Information increases at a faster rate through journals either in printed or electronic version but library funds do not increase fast enough to provide complete coverage of each subject.

The growth of journals is also related to the growth of research papers which is the outcomes from the increasing student population and universities worldwide. The increased number of universities have stimulated the rapid growth of students who have interests in research and development Thus, these researchers will be interested to publish their original works in scholarly publications to get recognition in their specialised fields. As the information needs of researchers increase, the supportive role played by libraries needs to be updated with a new collection of new subjects. As computer science studies is new in Malaysia, there is a need to upgrade the relevant library collection to cater to researchers' needs. A good collection of primary sources like the scholarly journals will help serve the research community better since journals form that main channel to disseminate research results. In this Information Age, electronic journals play a more important role through the Internet

as research results can be distributed widely all over the world. The journals are normally produced at a fairly frequent rate, providing researchers access to up-to-date information regularly. Besides this, researchers use journals to present their current research findings.

As such, a university needs to build up a collection of quality periodics in order to support students and teaching staff with the latest research information in any subject field. According to Zainab (1997), the coverage of scholarly journals in Malaysia in the field of STM have reached an acceptable level of quality based on the fact that some are being indexed by major international indexing and abstracting services. However, most of the 43 Malaysian STM journals fall within the field of biological, life and agricultural sciences. In order to achieve the same degree of recognisation in scholarly publications, the field of computer science needs to provide Malaysian researchers with a variety of quality periodics to stimulate and sustain research. In fact, this is in line with the aspirations and focus of the Malaysian government on research and development in information technology (IT).

Another problem that the libraries face is the increasing price of scholarly journals which does not increase proportionately with the increase of research papers. Adverse comments on the rising cost of journals have been actively discussed since the early 20th century. The large volume of journals published each year makes it almost impossible for any library to acquire but a fraction of a particular subject publishing output. Subscription prices have grown by a few hundred percent from one decade to the next. Some of the increase can be attributed to inflation and some to the growing size of journals published (Moline, 1989). For example, major

research libraries in the USA had increased their acquisition budgets during the 1970s and 1980s which appreciably exceeded the rate of inflation. The proportion of their budgets which they devoted to the purchase of serials rose from 40 percent to over 50 percent over this period. Yet their average serials holdings dropped from about a third of the relevant titles to just over a quarter (Page, Campbell and Meadows, 1997, 20-21). Therefore, the proliferation of serial titles as well as their rising prices becomes a particularly dynamic issue today.

The outcomes of these two problems effect serials acquisition in libraries. As new knowledge have arisen especially in such fields as computer science, acquisition librarians need extra budget to acquire suitable journals to statisfy user needs. Libraries react by having to balance their allocation between books and journals. In the usual practice, the budget for journals will be affected adversely as it covers the largest proportions of library budgets. Most often, libraries embark on a study of journal selection and deselection exercise as a method to build a good journal collection to support research, teaching and learning in academic institutions.

1.3 Development of Journals in the Field of Computer Science

In today's world, information moves and evolves rapidly. The history of computer usage had started more than 50 years ago, when computer science became a new subject in the area of science and technology. The widespread availability of computers has prompted an explosion of applications, especially in the recent field of information technology. The growth of literature in the field of computer science and information technology have given rise to a number of specialised journals in this field. The development of computer science has impacted the collections of this

subject in libraries to cater for research needs. This is also indicated by the growth of journals in this field. In order to be in the frontline of scientific research, an academic library needs to provide their researchers with the latest publications of this field either in printed or electronic version. Articles in scholarly journals are highly used by scientists as they report narrow and specific subject areas of computer science.

Journal prices continue to rise higher than inflation rates forcing libraries to embark on serials cancellation projects. Other factors which influenced the serial cancellation project is the economic recession that resulted in the reduction of library revenues. A number of serial cancellation projects conducted were based on journal use study, faculty and librarian reviews of cancellation lists and cost studies. Some of the guidelines used were collection balance between books and journals, duplication of titles, active usage of each journal and journal ranking based on *Journal Citation Report (JCR)*. Computer science studies in Malaysian universities are still in the early stages and need to be supported by a strong periodical collection on computer science. The emerging researchers in Computer Science cannot afford to be affected by journal cancellation exercises as research in this area is dependent on the availability of current periodical.

The selection of appropriate material and sources in new subject areas in university libraries go hand in hand with the assurance that the collection not only fulfill the needs of undergraduates but also provide quality materials to promote research. Postgraduate students and academic staff who undertake research needs access to past research findings. The journal is one of the main supplier of past research

findings and is able to provide latest information on new findings. In this study, the computer science journals listed in *JCR* were chosen as an evaluative tool to check on the degree of journal availability in selected Malaysian university libraries. *JCR* was published by *ISI* as one of the three citation indexes and it is useful for journal selection, cancellation and weeding decision in libraries (Nisonger, 1994). Moreover, journals ranking provided by *SCI* in *JCR* are high in quality as they are monitored by the indices chosen by advisory boards of experts in each topic represented and by large-scale citation analysis. This was further emphasized by Carpenter and Narin (1981) that the *JCR* did not try to cover all the world's scientific journals but rather the significant, recognized, influential and mainstream science journals. This indicated that the journals listed in *JCR* are of high quality as most published works are by well-known names in a particular field.

There are two important criteria in *JCR* that can be used for evaluating a serial collection, these are (a) total citation received and (b) impact factor. The 'impact factor' is indicative of journal quality. A journal's impact factor is an estimate of the total number of citations, on average, an article published in that journal receives (Meadows, 2000). A high journal impact factor indicates that the journal is an important journal and works published in it are highly cited. This implies that the referred journal achieves certain level of quality and may be one of the core journal in a particular discipline. A good journal collection in any subject should constitute core journals which are ranked by impact factors and listed in *JCR*. Hence, impact factors are useful in helping a library decide the optimum coverage of both special and general journal collection in a specific field. Buffardi and Nichols (1981) also stressed that impact factor "...is probably the best single measure of journal quality

we have at present." Therefore, titles listed in *JCR* in the field of Computer Sciences are used in this study as a tool to measure the strength of a library's collection to support research.

This study will focus on Computer Science. Journals are used for this study due to its fast dissemination of information compared to other types of sources. This study will focus on journal duplication and overlap in the field of computer science among selected Malaysian university libraries.

1.4 Context of Study

Malaysia has allocated about RM 92 million in 1998 to research in the field of Information, Computer and Communication Technology. According to the 1998 *National Survey of Research and Development*, there was a drastic increased of total research and development (R&D) expenditure in the area of Information, Computer and Communication Technology (i.e., 23 times) from RM 4 million in 1996 to RM 92 million in 1998 (MASTIC, 1999). The dramatic increase shows the importance the Malaysian government places Information Technology. Subsequently, the supporting role played by libraries to provide resources and material for researchers. The study of journal collection development in this field of Computer Science in local university libraries is therefore timely. There is a need to lessen the impact of increasing cost of serials and also the dollars that is required to handle, process and house bound journals. This study aims to find out the journal collection in Computer Science in local universities and gives some suggestions on how to overcome the problem. The study traced the degree of duplications and overlaps of serial titles among selected local universities in Malaysia, such as UM (University of Malaya),

USM (University of Science Malaysia), UTM (University of Technology Malaysia), UKM (National University of Malaysia) and UPM (University Putra of Malaysia). These universities were selected because they offered degree programmes in Computer Science.

The list of serial titles was taken from the American Institute of Scientific Information's *Journal Citation Report (JCR). JCR* is an essential, comprehensive and unique resource tool for journal evaluation. It is also one of the main sources of citation data on journals, and includes virtually all specialties in the areas of science technology and social sciences. Based on its wide coverage of journals, i.e. 4,500 journals, journal titles in *JCR* was used in this study as sample. There are 301 titles listed under Computer Science and the study involves the checking of availability and holdings of these titles in five local universities through their library online catalogues (OPAC). Impact factor will be used in this research as one objective measure of journal value and as an indirect measure of journal use. According to Garfield (Garfield, 1984, p. 10A), *JCR* also gives good indication of a journal's overall use, it provides a starting point for true cost-benefit analysis in allocating acquisition funds.

There are serious considerations to ponder when journal costs keep rising and income possibilities are almost exhausted. This will hasten the time for more libraries to cut cost, for instance, cancelling low use and high cost journals. Thus, to avoid serious damage to our local Computer Science collections, this study aims to investigate and determine suitable actions to be taken at an affordable budget to help alleviate the serious situation. Another important aspect of the study is to find out

the level of serial duplications and the degree of journal overlap occurring in the field of Computer Science.

1.5 Aims and Objectives of the Study

This study hopes to collate information on the kind of journal collections each selected local universities have in Computer Science. The findings will help provide an overview on the current status of the Computer Science journals in local universities. It also serves as a guide to scholars for further studies in the area of journal duplication and overlap. This study aims:

1) To find out the status of availability and holdings of top ranking journals listed in *JCR* among selected university libraries in the field of Computer Science;
2) To provide guidelines regarding journal collection development decisions among the local university libraries;
3) To find out the strengths and weaknesses of Computer Science journal collection in the selected university libraries; and
4) To find out the cost involved in overlapping journal subscriptions.

1.6 Research Problems

The study aims to answer the following questions.

1) What is the extent of serial overlapping among the selected university libraries in Malaysia?
2) What is the level of availability of each journal title from the selected university libraries in Malaysia?
3) Are the duplicate titles priced higher than non-duplicate titles?

4) Is there a relationship between duplicate serial titles and certain characteristics of serials, such as publications form, publications starting date, language, price and impact factor (citation frequency and cited half life)?

1.7 Assumptions

The study is being carried out based on the following assumptions:

1) All selected local university libraries have entered and updated their journal records information regularly in their online catalogue system;
2) Economic conditions has an impact on effecting the acquisition of library material such as the implementation of journal cancellation due to budget constraints or rising cost of journals;
3) All academic libraries that support research and development (R&D) depends highly on its collection of scholarly journals;
4) There is a correlation between duplicate titles and high citation frequency or impact factor; and
5) All selected local university libraries have policy agreements on inter-library loan.

1.8 Limitations

The limitations of this study are identified as follows:

1) Price data provided by a source other than the acquisitions database may cause minor error from a discrepancy between the price given in the source and the actual price paid by the library (allowing for any discounts received);
2) Some libraries OPAC (Online Public Access Catalogue) may not have indicated changes of titles and holding descriptions are not clearly stated;

3) All serial titles taken from *JCR* did not include monographic series;

4) Journals on order are not included in the study.

1.9 Scope and Sample

This study focuses on selected local university libraries journal subscriptions on the subject of computer science. These selected universities are those offering the degree programmes in Computer Science. A total of 301 current journal titles of Computer Science under seven categories listed in *JCR* is taken as the sample for study. The seven categories are as below:

1) Artificial Intelligence

2) Cybernetics

3) Hardware and Architecture

4) Information Systems

5) Interdisciplinary Applications

6) Software, Graphics, Programming

7) Theory & Methods

The listed journal titles will be checked against *ULRICH's International Periodicals Directory* for their prices, frequency, language and full titles. The subscription cost is taken as the price paid for each title in 1999 as given in the *ULRICH's* database that is available on CD-NET provided by the University of Malaya's main library. Each list of journal titles in the seven categories was checked against the holdings database of online catalogues of the selected five universities.

1.10 Organisation of the study

This chapter presents the general issues concerning journal holdings in libraries, such as prices, overlaps and duplicates. The chapter also highlights the reason for choosing journal collection in the field of Computer Science, outlines the aims, problems and limitations of this study. Chapter 2 presents relevant literature pertaining to this study and issues relating to journal overlaps and duplicates, price increases and journal cancellations, usage of journal citation reports (*JCR*) and impact factors, cooperative measurements among libraries, and the importance of consortium / consortial licences for libraries. Chapter 3 describes the methodology used to conduct this study, the participating institutions, the sample, methods of data collection, and treatment of data. Chapter 4 presents the findings and Chapter 5 discusses the findings, conclusions, and recommendations for future study.