CHAPTER–5

FINDINGS AND SUGGESTIONS/RECOMMENDATIONS

5.1 Introduction

Information technology provides the advantages to academicians, ordinary information seekers or miscellaneous groups by making available the right information at the right time. Access to information through faster communication by using the digital devices or electronic media are unavoidable across the globe and library and information science profession is not an exception to this. IT is being used in the fields of information procurement, processing, information dissemination, communication networking and user services–almost all the field of interest of the user satisfaction. The impact of this technology of the management of libraries has already been felt strongly. The new technologies have given birth of concepts like digital libraries, electronic libraries, virtual libraries etc., which require reengineering of knowledge organization in the library. Satellite commutations are already being used for full-text storage and transmission of information, distance, volume, and other related factors will determine how quickly this technology will be widely adopted for the library applications.

Though the IT infrastructure of Bangladesh is not at per with the developed countries, in spite of having insufficient finance a significant change is being observed in the field of library and information science. Bangladesh is going to establish a sustainable information communication infrastructure for keeping touch with global information flow. Libraries and information service centres are also getting immense facility to co-opt with information world. Tough, internet and broadband connections rate is unsatisfactory. Digital Data Network (DDN) and WiMAX facilities are still at infancy.
The data (findings) of the study have been analyzed in chapter-4 under two headings (as preliminary survey and final survey) in details to fulfill the aims of this research project. The key findings of the preliminary and final survey, and also the inferences of the formulated hypotheses are given below. Some of the recommendations have also been added as per the observations and findings; here a model plan for a university library consortium has been schemed out for the future action plan of the university libraries, in addition constraints of the study and a guide line for further study to the future researchers are also discussed.

5.2 Constraints of the Study

This study has been carried out by survey method. Some major university libraries were selected as sample of this survey. To avoid the bias and the blame of the partiality, the survey has been designed into two stages for the sake of convenience and scientific progress: (i) preliminary (census samples) and (ii) final (on the selected samples). Both steps have been done on the basis of questionnaire method. And both the surveys have been conducted based on the data collected through structured questionnaires. Both the questionnaires were mailed to the respondents through post. The response rate in preliminary survey remains at 83.75% while it is 91.67% in final survey. In order to achieve the highest rate of response, the investigator sent several reminders, made phone calls, and repeatedly pursued the matter at personal levels, besides he expedited the process of response through personal contacts, interviews, and discussions whenever needed. Unfortunately, several respondents have left out many pertinent questions unanswered – either due to the fact that, they may not understand survey objectives, or they have no information to offer. This has caused a great deal of problem in tabulating data, and making the analysis inconclusive, in certain fronts. Specially, in case of budget allocation and expenditure, some respondents have not disclosed their expenditure. In the questionnaire, the respondents were asked to provide data pertaining to their budget of the previous years to show the gradual trends in fiscal allocations. But, unfortunately most of the respondents have not furnished data on such crucial issues on which the application of IT depends.
heavily. Again, this poor response on fiscal front could be attributed to two reasons—either due to their institutional restrictions imposed by their parent body, or owing to the fact that such disclosure may affect their institutional interest. Likewise, the respondents have not mentioned the number of their registered users. A few of them have mentioned the total number of student of their university as their users, but all the students might not be registered users of the library. A few number of respondents have indicated to see the report of UGC, which they had submitted.

However, by the charismatic effort the investigator received a satisfactory number of feedbacks. Where, Raj (2002: 177-179) has opined that, questionnaires delivered and returned by mail, however, usually have mortality rate of 60% to 70%. Fortunately, average success rate of response through filled-in questionnaires of both the surveys (preliminary and final) remain at 87.71%, which is, no doubt a pleasurable sign.

5.3 Findings

An investigation remains incomplete without its findings. Such findings are the outcome of the data analyzed and interpreted, inferences drawn, laws deduced and conclusions arrived at by the scholar based on his observations and experiences. This study is an empirical study entitled, “Uses of Information Technology in Some Selected University Libraries in Bangladesh: An Analytical Study” which was conducted based on the questionnaire method in two stages- the preliminary survey, and the final survey. Mention may be made that 67 university libraries were included in the preliminary survey and on scrutinize of relevant data, and keeping the ability of the library to contribute information substantially to meet the survey objectives, only 24 university libraries were ranked and selected for inclusion in the final survey, out of which 22 were responded. To fulfill the objectives of the study, it was important to unmask the present status of university libraries of Bangladesh with special emphasis given on the status of IT application in their library operations along with their growth, collection, workforce, budget, etc. When the collected data were analyzed in chapter-4,
some crucial outcome were derived. These outcomes are given separately under the heading of ‘preliminary survey’ and ‘final survey’ respectively.

5.3.1 Key Findings of Preliminary Survey

Preliminary survey feedbacks were analyzed in chapter-4 under the section 4.2, where the sample size was 67 university libraries from Public, Private and International universities. The key findings of the preliminary survey are given below:

(i) The first university library of Bangladesh was founded in the year 1921 at the time of British rule in India, i.e. the University of Dhaka. After a long interval 2nd University of Bangladesh (Rajshahi University) was founded in 1953. Historically, 1 university was established under the British rule and other 4 universities were established in between British and pre independence period of Bangladesh. So, total 5 universities were established in between 1921–1970. Private university act was enacted in 1992 and it has opened a new horizon for the students and the entrepreneurs. During 1991 to 2008 optimum growths of university libraries in Bangladesh have come out. The study finds that 17 (25%) university libraries were established between 1991-2000 and within the next seven years (2001-2008) the highest numbers 42 (63%) out of 67 university libraries were founded. 10 public, 31 private and 1 international. [Details in section 4.2.1 of Chapter-4].

(ii) Unfortunately higher education in Bangladesh is almost capital or nearly capital centric. Bangladesh consists of 6 divisions. 49 (73%) out of 67 samples are in Dhaka and the rest of universities are scattered in other divisions. Where, 12 out of 22 public universities, 36 out of 43 private and 1 out of 2 are situated in Dhaka Division. It is an attention-grabbing matter that 52 (77.61%) university are functioning in city, 9 (13.43%) in district level and the remaining 5 (7.46%) are functioning in Upazila and 1 (1.5%) in rural areas. However, most of the private universities are situated in financially rich division, where 36 in Dhaka, 4 in Chittagong and 3 is in Sylhet. [Details in section 4.2.2 of Chapter-4]
(iii) 25.37% (17) universities (3 public, 14 private) out of 67 are having less than 20,001 library materials collection, followed by 5 (7.46%) universities (2 public and 2 private and 1 international) possess a collection between 20,001—30,000; and 5 universities (2 public and 3 private) are having more than 50,000 materials. It is remarkable that, only 5 (7.46%) public universities possess a collection of above 100,000. [Details in section 4.2.3 of Chapter-4]

(iv) Only 3 (4.47%) (Public university libraries) have more than or equal to 100 workforce, while most of the public university libraries have been maintained by less manpower than these 3. Most of the libraries are run by a very negligible size of workforce like- 36 (53.73%) out of 67 are run by between 1–10 workforce and it is the lowest. Where 14 (20.89%) university libraries fall into 11–20; 8 (11.94%) fall into 21–30 workforces class of intervals. Hence, the out come of the analysis is that, the growth of the library collections may have some little influence on the workforce size. 3 university libraries (University of Dhaka, Rajshahi and Bangladesh Agriculture University) with a remarkable size of collection are having a good number of workforces. [Details in section 4.2.3 of Chapter-4]

(v) Where Digital Bangladesh is a slogan, then about 4% university libraries have not installed computer and 64 (95.52%) out of 67 university libraries have installed computer. 20 (90.91%) out of 22 public university libraries have installed computer and 2 (9.09%) have not, where as, 42 (97.67%) out of 43 private university libraries have installed computer and remaining 1 have not; and interestingly 2 (100%) out of 2 international university are using computer. [Details in section 4.2.5.1 of Chapter-4]

(vi) It is a repellent figure that, 40 (59.7%) out of 67 university libraries are using computer for word processing only, followed by 26 (38.81%) are using computer of all purposes. Where 72.73% public and 55.81% private universities are using computers for word processing only, and 27.27% public and 41.86% private universities are using computers for all purposes. Interestingly, 2 (100%) out of 2 international universities are using computer for all purposes. [Details in section 4.2.5.2 of Chapter-4]
(vii) Internet has become an indispensable resource for university libraries worldwide to enhance collections and improve services and operations. Unfortunately, the figure of Internet connectivity in the university libraries in Bangladesh is far from satisfactory. Only 45 (67.16%) out of 67 university libraries have internet connectivity followed by 6 (8.96%) have plan to get connection in near future, and 6 (8.96%) do not have any plan. Individually 11 (50%) out of 22 public, 32 (74%) out of 43 private and 2 (100%) out of 2 international university libraries have internet connections. [Details in section 4.2.5.3 of Chapter-4]

(viii) Automated cataloguing is the most common phenomena, here 28 (41.79%) out of 67 university libraries have automated catalogue, followed by 9 (13.43%) university libraries’ automation works are going on, 23 (34.33%) university libraries have plan and 7 (10.45%) university libraries do not have automated catalogue nor even its plan. Individually 7 (31.82%) public university, 19 (44.19%) private and 2 (100%) international university libraries are providing their own automated bibliographic database services for their library users. [Details in section 4.2.5.4 of Chapter-4]

(ix) 14 (20.90%) out of 67 university libraries are using automated library acquisition systems, followed by 13 (19.40%) university libraries’ automation woks are going on, 27 (40.30%) are having plan and 13 (19.40%) do not have any plan in near future. Individually 3 (13.64%) public, 10 (23.26%) private and 1 (50%) international university libraries are using automated acquisition system. [Details in section 4.2.5.5 of Chapter-4]

(x) Though automated circulation system has made the library activities easier, individually only 4 (18.18) out of 22 public, 10 (23.26%) private and 1 (50%) international university libraries have added the automated circulation facilities in their library management services. It is found in the preliminary survey that only 15 (22.39%) out of 67 university libraries have automated circulation system in their library management system, followed by 14 (20.9%) have mentioned that their work of automated circulation system is going on, 27 (40.3%) have plan and
11 (16.41%) universities do not have this facility nor have plan for it in the near future. [Details in section 4.2.5.6 of Chapter-4]

(xi) OPAC is an outreach bibliographic record services, where LAN, MAN or WAN are available. Only 7 (10.45%) out of 67 university libraries have OPAC facilities, followed by 9 (13.43%) where the work is going on, 34 (50.75%) having plan for OPAC and 17 (25.37%) do not have plan. Individually 2 (9.09%) public, 4 (9.3%) private and 1 (50%) international have OPAC facilities. Though it is a disappointing figure, but a large number of public (54.55%) and private (51.16%) universities have plan for OPAC in near future. [Details in section 4.2.5.7 of Chapter-4]

(xii) The respondents have revealed ambiguous responses regarding number of users. Some of the samples (respondents) have skipped the registered user terms at the time of their responses and they have used their total student size and some libraries have not. 56 (83.58%) out of 67 libraries have responded. However, total 23 (41.08%) out of 56 respondents university libraries have more than 2000-above users, and it is the highest. Where as, the second highest 13 (23.21%) university libraries have 1001-1500 users. Actually, the respondents have made confuse, although all the students of a university are eligible to be member of their university library, a student may not be a registered member but he or she may use their library materials without borrowing. Accordingly all of the valid students are the users of their university libraries. Similarly, without a library card a student may not be treated as a bona fide user of a library. It is remarkable here that Rajshahi University has mentioned the number of their users as 21,629 and it is the total number of their students. [Details in section 4.2.6 of Chapter-4]

(xiii) In spite of several trying the investigator could not get enough responses regarding budget. Out of 67 respondents only 36 (53.73%) respondents have unmasked their budget. The budgetary data has been classified into 10 classes, like 1-1000000, 1000001-2000000 etc. Here, the highest 13 (36.18%) out of 36 respondents fall under 1- 1000000 class and the highest number (11 out of 21) of private university fall in the same class. Interestingly 4 (28.57%) public university
libraries out of 14 respondents have more than 10 million taka budget and 2 (9.52%) private university libraries fall in the same class of interval. [Details in section 4.2.7 of Chapter-4]

5.3.2 Key Findings of Final Survey

The final survey of this study was analyzed under section 4.3 in chapter-4, the study was done on the feedbacks of the 22 top ranked (major) university libraries of Bangladesh. Here the key findings of the final survey are as follows:

(i) 7 (31.81%) out of 22 samples are run by 1-10 workforce. Again, 4 (18.181%) and 5 (22.73%) are run by 11-20, 21-30 workforce respectively. 2 (9.09%) university libraries each are run by 31-40 and again more, 2 (9.09%) each run by 91-100 staff members. [Details in section 4.3.1.2 of Chapter-4]

(ii) Total manpower of 22 university libraries are 782 (average 35.54), professional staff 182 (average 8.27), Para-professional 120 (average 5.45), non-professional 443 (average 20.14) and IT professional 37 (average 1.68).

Individually, there are in total 540 (average 77.14) staff in 7 public university libraries. Professional staff 91 (average 13), Para-professional 79 (average 11.29), non-professional 347 (average 49.57) and IT professional 23 (average 3.29).

Again, the total manpower of 14 private university libraries is 233 (average 16.64), professional staff 88 (average 6.29), Para-professional 39 (average 2.79), non-professional 92 (average 6.57) and IT professional 14 (average 1).

Further, the total manpower of one international university library is 9, where professional staff 3, Para-professional 2, non-professional 4 and no IT professional.

It is remarkable that Dhaka University library is run with the highest number of Non-professional staffs/Manpower at its credit. [Details in section 4.3.1.2.2 of Chapter-4]
(iii) 15 (68.18%) out of 22 university libraries feel that their existing workforce is insufficient and the remaining 7 (31.82%) feels the opposite. It is clear that, most of the university libraries need more manpower. [Details in section 4.3.1.2.3 of Chapter-4]

(iv) 1 (4.55%) out of 22 university libraries has not responded to the question. 17 (77.27%) university libraries are deputing their staff to attend training programmes to enhance their professional skill; and the remaining 4 (18.18%) university libraries do not. Though, the most of the libraries are deputing their staffs in training programme to enhance their professional skills. It is observed that private university libraries are ahead to depute their staff for training program. [Details in section 4.3.1.2.4 of Chapter-4]

(v) 15 (68.18%) out of 22 universities arrange in-house training program for their workforce; followed by remaining 7 (31.82%) universities do not. The study also observed that private university libraries are ahead in comparison to public university libraries. [Details in section 4.3.1.2.5 of Chapter-4]

(vi) 5 (22.72%) each of the top ranked university libraries possess a collection between 10,001–20,000 and 100,000–above classes respectively and scoring highest, followed by 4 (18.18%) having a collection between 40,001-50,000 library materials; 3 (13.64%) university libraries having 30,001-40,000 library materials; 2 (9.09%) university libraries having 20,001-30,000 library materials; 1 (4.55%) each of the university library possess library materials under the class intervals of 1–10,000; 60,001–70,000 and 90,001-100,000 respectively. Mention may be made that, Dhaka university library possess the highest number of collections, the second highest is Rajshahi university library, and both of them are public university. [Details in section 4.3.1.3 of Chapter-4]

(vii) It is observed that 6 (33.33%) out of 18 top ranked university libraries of Bangladesh are having a user population between 5001–above which possess the highest number of users; followed by 3 (16.66%) are having 1–500 users, which are second highest. [Details in section 4.3.1.4 of Chapter-4]
(viii) 5 (25%) out of 20 top ranked university libraries are having more than 10 million taka of annual budget allocation, these are University of Dhaka, Bangladesh University of Engineering and Technology (BUET), University of Rajshahi, Bangladesh Agricultural University (BAU) and Independent University Bangladesh (IUB); among them 4 are public and 1 is private university libraries. The responses of annual budgets have been classified into 11 classes of interval (limits of interval is 5,00,000) based on the Bangladeshi currency (taka). 2 (9.09%) out of 22 university libraries of Bangladesh do not have any specific annual budget. However, the annual budget of the highest 7 (35%) out of 20 respondents university libraries fall into 50,00,001–above class of interval; 3 (15%) university libraries fall in each of 5,00,001–10,00,000, 10,00,001–15,00,000 and 25,00,001–30,00,000 classes respectively; 2 (10%) university libraries have budgetary range between 15,00,001–20,00,000; and 1 (5%) university libraries falls in each of 30,00,001–35,00,000; and 45,00,001–50,00,000 classes respectively. [Details in section 4.3.1.5 of Chapter-4]

(ix) Though the number of computers may not indicate the complete IT status of the library concerned, but it shows the intention of IT using. All of the 22 top ranked university libraries are using computers in their library services. The data shows that, 22 top ranked university libraries altogether have a total of 446 (average 20.27) computers and 68 (average 3.09) printers. Further more, 17 out of 22 university libraries are using barcode readers and followed by 18 are having scanners. Data regarding computer have been analyzed again as- the number of computers have been classified into 6 classes of intervals (each limit 10). It is found that 10 (45.45%) out of 22 university libraries have computers which fall in between 1–10 class of intervals, and highest numbers of university libraries fall here, followed by 4 (18.18%) university libraries have 11–20 computers; 3 (13.64%) university libraries fall in each of 21–30 and 51–above classes respectively; and the remaining 2 (9.09%) university libraries fall into 31–40 class of intervals. [Details in section 4.3.1.6.1 of Chapter-4]
(x) All of the respondents (22 out of 22) are connected through dial up or broad band or VSAT based internet connectivity. Though, it is found in the preliminary survey that only 67.16% university libraries are connected with Internet. [Details in section 4.3.1.6.2 of Chapter-4]

(xi) 20 (90.90%) out of 22 top ranked university libraries have Local Area Network (LAN), followed by 3 (13.64%) having connection with Metropolitan Area Network (MAN) and 5 (22.73%) having wireless network connectivity. It is encouraging that 3 (13.64%) university libraries have plans to connect with wireless network. From the responses it id found that since majority of the libraries have LAN connections, they would effectively share information to their colleagues or local users, besides starting their ‘intranet’ service easily. [Details in section 4.3.1.6.3 of Chapter-4]

(xii) 11 (50%) out of 22 university libraries have their own websites, followed by 2 (9.09%) have plan; 7 (31.82%) have no plans for library website. To market the library to the outside world a library should open website, if it is not possible now, they should open intranet based local page for the local users. [Details in section 4.3.1.6.3 of Chapter-4]

(xiii) 20 (90.91%) out of 22 top ranked university libraries are currently providing automated bibliographic/cataloguing services to their users; remaining 2 (9.09%) university libraries have plans to provide automated cataloguing/bibliographic services in near future. [Details in section 4.3.1.6.4.1 of Chapter-4]

(xiv) 16 (72.72%) out of 22 top ranked university libraries are having circulation facility in their Library Management System (LMS), 5 (22.73%) have plans to include their circulation control in future. While, 90.91% university libraries are using LMS for automated catalogue/bibliographic services, among them only 72.72% are providing automated circulation services to their users. Perhaps, their existing library management software does not provide circulation modules. [Details in section 4.3.1.6.4.2 of Chapter-4]
(xv) 11 (50%) out of 22 top ranked university libraries have OPAC facilities and the remaining 11 (50%) universities do not have OPAC, but they have plan to provide OPAC facilities in near future. [Details in section 4.3.1.6.4.3 of Chapter-4]

(xvi) 16 (72.72%) out of 22 top ranked university libraries are using Customized Software; followed by 4 (18.18%) are using WIN/ISIS; and 1 (4.55%) (University of Dhaka) is using purchased software named GLAS; and remaining 1 (4.55%) is not using any library management software. [Details in section 4.3.1.6.4.4 of Chapter-4]

(xvii) 7 (31.81%) are providing digital library services; 7 (31.81%) do not offer such services and they do not have plan too in near future; remaining 7 (31.81%) have plan to provide such services in future, 1 (4.54%) has skipped the response. Interestingly, Only 2 (9.09%) have mentioned the names of their used DL software but 5 libraries do not mention the names of their DL software. [Details in section 4.3.1.6.4.5 of Chapter-4]

(xviii) 11 (50%) out of 22 top ranked university libraries of Bangladesh are providing indexing services; followed by 4 (18.18%) providing abstracting services; 18 (81.82%) bibliographic services; 17 (77.27%) CAS services, 14 (63.64%) SDI services, 15 (68.18%) research report services, and 15 (68.18%) News paper clippings services to their users. [Details in section 4.3.1.7.1 of Chapter-4]

(xix) 100% (22 top ranked university libraries) university libraries have Internet connectivity. And 15 (68.18%) university libraries are providing fulltime internet facility to their users; followed by 13 (59.09%) university libraries are providing time bounding internet facilities; 13 (59.09%) are providing full-free internet services and 7 (31.82%) are providing Internet services on subsidized fees. Thus, it is clear that, most of the university libraries of Bangladesh are providing full free Internet facilities to their users. [Details in section 4.3.1.7.2.1 of Chapter-4]

(xx) 17 (77.27%) out of 22 university libraries are providing online database services; followed by 18 (81.82%) are providing online full text journals services; 13 (59.09%) providing CD-ROM Database services; 13 (59.09%) providing e-mail-
based CAS & SDI services, 8 (36.36%) providing e-mail-based newsletter services, and 13 (59.09%) providing printing facilities to their users. [Details in section 4.3.1.7.2.2 of Chapter-4]

(xxii) 19 (86.36%) out of 22 university libraries are providing photocopying services; followed by 2 (9.09%) are not providing such services; and the remaining 1 (4.55%) is having plan to include it in near future. Though, currently microfilm/fiche service is obsolete, 2 (9.09%) university libraries have mentioned in their feedback that they are providing microfilm/fiche services to their users. [Details in section 4.3.1.7.2.3 of Chapter-4]

(xxiii) As evident from the final survey 10 (45.46%) out of 22 university libraries have felt that, 'inadequate budget' is a major problem to apply IT in their respective libraries; followed by 8 (36.36%) have stated that, 'the existing cost of IT is quite unaffordable', 8 (36.36%) of them mentioned that, 'software which are currently available in the market are quite costly'; and 15 (68.17%) of them have considered the 'non availability of separate budget for IT' as the real problem for their libraries in use of IT. [Details in section 4.3.1.8.1 of Chapter-4]

(xxiv) In answering the question of introducing IT in respondents' libraries, 12 (54.54%) out of 22 university libraries reveal that 'lack of administrative support' is not barrier, followed by 15 (68.18%) respondents do not feel that 'lack of cooperation from colleague' is not an obstacle; 13 (59.09%) respondents feel that
'lack of support from IT professional' is not barriers; 10 (45.45%) samples mention that 'lack of proper IT skill' is the main factor; 10 (45.45%) remark that 'more work and no extra pay' is a factor for making existing environment uncongenial. However, the study makes clear that, 'lack of administrative support', 'lack of cooperation from colleagues' and 'lack of support of IT professionals' are not major hindrances to apply information technology in their libraries; where, 'lack of proper IT skill' and 'more work and no extra pay' are considered as drawbacks in introducing IT in their libraries. [Details in section 4.3.1.8.3 of Chapter-4]

(xxv) Regarding the software used in libraries, 11 (50%) out of 22 university libraries of Bangladesh feel 'unavailability of software' is not the major problem for application of IT in their university libraries; 12 (54.55%) do not consider the 'existing software fails' to serve their in-house requirement as their major problem; 11 (50%) samples deny the statement 'software collection is tough'; 8 (36.36%) agree 'free software are unavailable'. Further, 6 (27.27%) state that 'inadequate IT news' as problem in IT application in their libraries as it keeps them unaware about development and utility of new software products, where as the majority 12 (54.55%) deny this argument and 4 (18.18%) do not respond this question. [Details in section 4.3.1.8.4 of Chapter-4]

(xxvi) 8 (36.36%) out of 22 top ranked university libraries feel 'shortage of machineries' is not a problem for them to apply IT in their library activities; followed by 11 (50%) samples have consider that 'Low Internet speed' is the major problem that truly prevent the application of IT perfectly. However, majority portions (50%) of the respondents feel 'shortage of machineries' and 'Low Internet speed' as the major problem. [Details in section 4.3.1.8.5 of Chapter-4]

(xxvii) 11 (50%) out of 22 university libraries have considered 'lack of adequate manpower' is one of the most important problem to apply IT in their respective libraries; followed by 16 (72.73%) university libraries have stated that, 'lack of IT trained manpower' is truly hindrance to introduce IT in their respective library activities and operations. [Details in section 4.3.1.8.6 of Chapter-4]
(xxviii) 10 (45.45%) out of 22 university libraries in Bangladesh feel that IPR is the key problem in digitization of the library materials; 7 (31.82%) do not consider that Copy Right/IPR as a problem for digitization of their respective library resources. [Details in section 4.3.1.8.7 of Chapter-4]

(xxix) 15 (68.18%) each out of 22 university libraries feel that IT application in libraries provide the ‘optimum use of library resources’; and ‘increase prestige’; followed by 7 (63.64%) each have expect that they would get such helps in near future when they would apply IT in their libraries.

Again, 14 (63.64%) each mention that IT helps them to ‘expand library activities’ and ‘automatic report generating’; followed by 8 (36.36%) each look forward to get helps in future by applying IT in their libraries. Over again, 18 (81.82%) out of all samples have stated that by using IT they are ‘benefited in their library activities’; 4 (18.18%) seem that they would be beneficiaries in near future. [Details in section 4.3.1.9 of Chapter-4]

.xxx) By using IT ‘sharing library resources’ and ‘reducing staff cost’ 11 (50%) respondents each have mentioned their benefited views, remaining 11 (50%) have responded IT would help them to share library resources and reducing staff cost in near future. Again more, 8 (36.36%) samples have mentioned that IT application in libraries have brought them ‘cost effective’ and ‘familiar with digitization’; remaining 14 (63.64%) each expect that they would get such benefits in near future when they would apply IT in their respective libraries. [Details in section 4.3.1.9 of Chapter-4]

(xxxi) 12 (54.55%) samples have stated that IT application in libraries have help them in ‘saving space’ and ‘increase the use of digital materials’; 10 (45.45%) each samples have expressed that they would get similar helps in near future. Further 16 (72.73%) each out of 22 university libraries have responded that by using IT in their respective libraries they are getting help on ‘increase efficiency’, ‘minimize the retrieval time’ and ‘quick retrieval facilities’; remaining 6 (27.27%) each state
that they would get the same facilities in near future. [Details in section 4.3.1.9 of Chapter-4]

(xxxii) For providing library activities and services 19 (86.36%) out of 22 university libraries have responded that IT is helping them to make their ‘search facility easier’; remaining 3 (13.64%) have expressed that, IT would help them to make their search facility easier if they could apply IT in near future. 13 (59.09%) each out of 22 respondents state that by using IT their potential users are increased and they have given the impression on IT as a blessing for libraries; remaining 9 (40.91%) each have predicted the same views for future. [Details in section 4.3.1.9 of Chapter-4]

5.4 Testing of Hypotheses and Statistical Inferences

Total 8 null hypotheses were formulated and tested in Capter-4. Among them 5 hypotheses were formulated and tested in preliminary survey under the section 4.2.10 and 3 hypotheses were formulated and tested in final survey under the section 4.6. The inferences of the tested hypotheses are stated as follows:

h₀₁: There is no association between the management domain of the university and the computer installation in the university libraries of Bangladesh. The calculated value of \( X^2_{0.05} \) is 1.571, which is less than the table value (5.991). Hence, the hypothesis is accepted and proved true.

h₀₂: Location of the university libraries of Bangladesh does not have any association with internet connectivity. The calculated value of \( X^2_{0.05} \) is 5.113, which is less than the table value (7.815). Thus, the hypothesis has been accepted.

h₀₃: There is no relation between computer installation, Automated Cataloguing, Automated Acquisition, Automated Circulation and OPAC facilities in university libraries of Bangladesh. The calculated value of \( X^2_{0.05} \) is 44.776, which is greater than the table value (9.488). Thus, the hypothesis has been accepted.
rejected. Therefore, the study has supported the alternative hypothesis to establish that, there is a relation between computer installation, Automated Cataloguing, Automated Acquisition, Automated Circulation and OPAC facilities in university libraries of Bangladesh.

\( h_04: \) There is no relation between the mode of management and the number of collections in the university libraries of Bangladesh. The calculated value of \( X^2_{0.05} \) is 25.889, which is less than the table value (31.410). Thus, the hypothesis has been accepted.

\( h_05: \) There is no association between the number of Manpower and the Mode of Management of the University Libraries of Bangladesh. The calculated value of \( X^2_{0.05} \) is 98.907, which is greater than the table value (31.410). Thus, the hypothesis has been rejected. Therefore, the study has established that, there is an association between the number of Manpower and the Mode of Management of the University Libraries of Bangladesh.

\( h_06: \) There is no significant difference between the present staffing pattern of public and private university libraries of Bangladesh. The table value of \( t \) at 5% level of significance is 2.447, which is greater than the calculated value (1.027) of the experiment. Hence, the experiment provides no evidence against the hypothesis. Therefore, the hypothesis has been ‘accepted’.

\( h_07: \) There is no significant difference between the levels of IT applications in the private and public university libraries of Bangladesh. The table value of \( t \) at 5% level of significance is 2.093, which is less than the calculated value (3.921) of the experiment. Hence, the hypothesis does not hold true. Therefore, the hypothesis has been ‘rejected’ and the alternative hypothesis has been established as- 'There are significant differences between the levels of IT applications in the Private and Public university libraries of Bangladesh'.

\( h_08: \) There is no significant difference between the specialized general services of the private and public university libraries of Bangladesh. The table value of \( t \) at 5% level of significance is 2.179, which is less than the calculated value (4.10) of the
experiment. Hence, the hypothesis does not establish as true. Therefore, the hypothesis has been ‘rejected’ and the alternative hypothesis has been occupied the place of the null hypothesis as- ‘There are significant differences between the specialized general services of the private and public university libraries of Bangladesh’.

Therefore, 5 null hypotheses of preliminary survey has been validated by Chi-square ($X^2$) test among them 3 have been accepted and 2 have been rejected. And in the final survey, a total of 3 null hypotheses have been formulated and tested by $t$-test under, among these 3 null hypotheses only one hypothesis has been accepted and other 2 have been rejected.

5.5 Suggestions/Recommendations

Almost all the recommendations/suggestions are made on the base of the findings of this research. These suggestions are put forward to serve as a guide to all libraries in general and especially university libraries of Bangladesh which intend to automate their library process. The suggestion/recommendations are for the planners, administrators, library managers and policy makers of Bangladesh to take necessary measures to improve the existing services of the university library systems in the country.

5.5.1 The most chronic problem which the libraries are facing this paucity of budget allocation. The Government of Bangladesh or University Grants Commission should allocate a logical proportional budget for public university libraries and UGC should compel a logical annual budget for the private university libraries. As the final survey reveals that 12 (54.55%) out of 22 top ranked university libraries do not have any specific annual budget, which is undoubtedly contrary to their growth.
5.5.2 Library authority should allocate necessary funds to procure computer and other IT-based equipments. Though, the study shows that 68.17% of university libraries do not have regular budget for their IT equipments. Specified budget for IT must be given priority this will enable the acquisitions of relevant IT infrastructures within the limits of available financial resources.

5.5.3 The Existing allocation of fund for collection development needs to be increased for addition of latest publications in their respective field of interest to ensure a collection of reasonable size (currently 68% of the university libraries are having less than 50,001 volumes of collections).

5.5.4 The library is expected to play a major role in equipping and facilitating its users with the appropriate skills. The university libraries should be staffed by qualified library professionals. All professional functions should be carried out by a qualified librarian. This is needed because the final survey shows that only 23.27% of workforce employed in the university libraries of Bangladesh are professional, which seems to be so far from the actual requirement.

5.5.5 Properly qualified personnel are required for the application of IT in the university libraries in Bangladesh. There was a few of IT skilled manpower employed in university libraries of Bangladesh. It is found in the final study that only 4.73% of the staff working in the university libraries IT professionals. They should be familiar with the environment of web developing, programming, and system analysis etc. Department of Library and information science in the universities should revise their curricula to accommodate with the emerging ICT revolution in the provision of library services. This will help to take care of the shortage of IT skilled manpower in the country.

5.5.6 Nineteen percent of the university libraries do not depute their staff and nearly 32% do not arrange in-house training for their workforce. The data influence to suggest for deputing the library staff in various workshops, conferences, training programs and orientation as well as refresher courses at frequent intervals to improve their professional skill and to acquaint with the new
techniques and tools used in information management. Advanced training in more technical areas such as programming, web development, networking, network securities etc. should also be put in place.

5.5.7 From the response of the final survey it is found that 40% of the university libraries do not have any barcode reader, 31% do not have any scanner. 27.27% university libraries are not able to provide automated circulation system. So, to provide smooth automated library services, the procurement of relevant equipment should be emphasized.

5.5.8 University libraries in Bangladesh are lagging behind in terms of automation of library process compared to libraries in the developed countries. As a matter of urgency all library activities should be automated. 90.91% of the university libraries have only started creating databases of their collections. 50% of the university libraries who are not providing OPAC services to their users should start this services immediately not only for the benefit of the users, but also to make these services cost effective, time saving, and user-friendly.

5.5.9 Library software is very important for library automation. It is recommended that library management software with all modules should be procured. Library management software should be purchased with proper maintenance support. The software requires a permanent back-up of technology development by a well-established organization having adequate infrastructural facilities with R & D expertise.

5.5.10 36.36% University libraries in Bangladesh have stated that library management software is costly, which is hindering to apply IT in their libraries. There are various Open Source/Free and Open Source library management software giving the opportunity to customize the software according to the requirements. In that case, library professionals should be trained how to customize the Open Sources Software for their libraries.
5.5.11 Automation of all library processes can enhance the online inter-library resource sharing capacity through library networking of their library resources. It can enhance the library services at the desktop of a local user. Though a few number of university libraries does not have LAN (9.09%) facility, a large number of university libraries does not have MAN (86.36%) and wireless network (77.27%). So, as soon as possible all of the university libraries should establish these network facilities immediately.

5.5.12 Digital library/Institutional repository has changed the scenarios of the institutions in enhancing their visibility and prestige. 68.18% university libraries of Bangladesh do not have this. Various kinds of publications, such as pre-prints, and post-prints of journal articles, conference papers, research reports, theses, dissertations, seminar presentations, working papers and other scholarly items may be deposited in Digital library/Institutional repositories. There are many Open Source Software (e.g. Greenstone, DSpace, Eprints, etc.) available for building such digital library/institutional repositories. The study recommends that university libraries should start such activities immediately.

5.5.13 As per the study 31.82% of university libraries are still unable to provide fulltime internet services to their users, and 68.18% are not providing internet browsing facilities with subsidized fee. These university libraries should take Broad Band connectivity which would be more cost effective to provide round the clock internet services to their users for whom web based services are most important.

5.5.14 There is a need for the re-orientation of library services in developing countries especially for Bangladesh. Libraries should become more proactive in the provision of services. This can be achieved if adequate provision is made for the development of electronic information resources in order to guarantee effective globalization of library services through the utilization of Information and Communication Technologies. The study recommends that step should be taken by all the university libraries of Bangladesh to provide certain electronic/online-based most advanced services like Access to online database.
(22.73%), Online full-text journals (18.18%), CD-ROM database services (40.91%), e-mail based CAS/SDI (40.91%), e-mail based newsletter (63.64%) to their respective users.

5.5.15 Website of a library is an important and effective library marketing tool. Only 50% university libraries in Bangladesh have their library websites. Thus, the study highly recommends that the rest of the university libraries of Bangladesh should launch their library website immediately.

5.5.16 The study recommends that since the provision of IT facilities is very important to the globalization of library services, there must be a positive change of attitudes by library administrators, professional bodies as well as government towards the effective adaptation of IT in the university libraries of Bangladesh.

5.5.17 In view of the importance of the effective university library services for nation building, government should give priority to allocate adequate funding for libraries as this will help to ensure the provision of relevant IT infrastructures; similarly, university administration and library management should also prioritize investment in ICT within their limited funds.

5.5.18 The need for adequate user education on a new ICT-oriented library system should be considered. Each university library should make readily available to their users a well-prepared manual or handbook on the application of ICT in the library. Special training sessions should be organized for library users.

5.5.19 Like other developing countries, Bangladesh is also at the critical position where the development of technologies, economics and humanity largely depends on access to relevant and adequate information resources. Many renowned publishers are offering their journals on web freely and instantly, although in some cases, after a certain period. Many important organizations and institutions, such as WHO, FAO, UNICEF, UNESCO, World Bank are also uploading most of their information resources in their websites for free access and use. The importance and usefulness of such digital resources have
been realized throughout the world. The study recommends that university libraries of Bangladesh may also get access of these electronic resources/databases (e.g. HINARI, AGORA, DOAJ, INASP/peri) with a minimum fee or free upon registration.

5.5.20 To make a sustainable and sophisticated IT infrastructure in Bangladesh government should expose or reduce the VAT, TAX etc. on IT accessories. The libraries will also be benefited from these expositions.

5.5.21 It is a matter of regret that, the National ICT policy of Bangladesh avoided the term of IT/ICT use in Libraries, while the World Summit on ICT highly recommended the use of IT in libraries and information centres. The ICT/IT use for libraries should be included in the National ICT policy or Digital Bangladesh policy/strategy in near future.

5.5.22 The library and information science professional bodies of Bangladesh should organize seminars, workshops, and training program to create awareness among librarians about the potential advantage of automation and thus encourage more libraries to automate their library activities and services.

5.5.23 The staff working in university libraries should become member of professional bodies to take the advantage of their support and technical guidance, besides acquainting themselves with the new inventions, new trends and skills, new devices and the emerging technologies applied in library practices through seminars, workshops, and professional literature.

5.5.24 It is difficult to see libraries having clear policies and strategic plans for their services. Lack of library policy regularly affects library services and produces administrative dualism and conflict in some cases. The head of the library should write and review the library policies annually to identify core information resources to be acquired, organized and managed by the library. The Head of the library also should write guidelines for the selection, retention and disposal of resources.
5.5.25 Government and UGC should initiate policies towards the computerization of all of the university libraries, especially in the areas of resource sharing, interlibrary cooperation and should be encouraged to form a consortium of both public and private university libraries in Bangladesh. 'BULCon' (Bangladesh University Libraries Consortium) integrating each of them through wide area networking. A sketch of BULCon schema is shown in this chapter under the section 5.6.

The investigator hopes the aforementioned suggestions would certainly develop the existing conditions of IT using capacities of the university libraries of Bangladesh. Problems cannot be ridden of, if we cannot change our mentality. The investigator suggests the professionals to start their IT related activities as per their capability; a good starting shows the completion of successful dealings.

5.6 BULCon: A Proposed Schema

BULCon stands for Bangladesh University Library Consortium. The consortium would be set up for traditional resource sharing, e-resource sharing and procurement among the interested public, private and international libraries. Though knowledge producing rate of our country is low, but worldwide knowledge is producing in invigorate growth. Owing to the paucity of the budget of university libraries, rapid growth of knowledge, information and publication and also the immense demand of the users, the library network or library consortium is now a demand. Though, various library network initiatives have been taken, none could sustain. However, there is no alternative of consortium.

As per the research objective the investigator has proposed a consortium for the university libraries to share their traditional and electronic resources. The proposed consortium is called BULCon. Diagram-5.1 and diagram-5.2 have shown BULCon, and these are made on the combination of Star and Ring topology. Here, UGC has
been selected as a focal point and public, private & international university libraries are to be members as combined or individually.

The proposed model has been virtually split on the purpose of resources sharing, procuring, documentation, etc. Therefore, these virtually split BULCon has been shown under the following individual titles:

a) BULCon for interlibrary traditional resource sharing (shown under 5.6.5);
b) BULCon for interlibrary e-resource sharing (shown under 5.6.6) and
c) BERCon: A Future Expansion of BULCon (shown under 5.6.7)

5.6.1 Necessary Documentation for BULCON

The following necessary documentations are the most important to form a consortium:

By laws are the great sources of information on how a consortium’s governance structure is constituted. By laws often indicate the legal status of the consortium; describe committee structures, and membership criteria.

Memoranda of understanding generally outline the business relationships between the consortium and the member libraries, including the rights and responsibilities of membership.

Resource sharing agreement describes the ‘rules of the game’ for one of the basic functions of many library consortia sharing physical library resources. Some are restrictive, while others are fairly liberal.

Strategic plans in one sense reflect the way a consortium sees itself, or perhaps the way a consortium would like to see itself. They offer a good look into the “soul” of a consortium.
5.6.2 Members of BULCon

**Focal Point:** UGC has been chosen as focal point due to its legal supervisory attributes. The investigator could not find its alternative at time of model planning of BULCon. Investigator hopes that, UGC will play a great role to form the BULCon. As a focal point UGC is a supervisory authority of universities of Bangladesh. So, the investigator has chosen UGC as a focal point. As a supervisory authority it is a nucleus of the universities of Bangladesh. Accordingly, it can be easily accepted as a focal point that can play the following roles:

- Initiation of forming consortium;
- Preparation of a PCP (Project Concept Paper);
- Motivational influence to the interested universities;
- Fund arrangement, management and expend;
- Selection of procurable e-journals through the discussion with the consortium members;
- Preparation of By-laws for the consortium;
- Set up the necessary infrastructure and e-infrastructure for UGC and consortium members;

**Members:** All the university libraries of Bangladesh are eligible to be members of the Consortium. But initially only the interested universities can form the consortium. The investigator has classified the universities as per their mode of management (Public, Private and International) and has shown it in the BULCon diagrams for ease of better understanding.
5.6.3 Key Objectives of BULCon

The key objectives of BULCon are given below:

- Increase the cost benefit per subscription;
- Promote the rational use of funds;
- Ensure the continuous subscription to the periodicals subscribed;
- Guarantee local storage of the information acquired for continuous use by present and future users;
- Develop technical capabilities of the staff in operating and using electronic publication databases;
- Strategic alliance with institutions that have common interest resulting-
  - Reduced information cost;
  - Improved resource sharing.

5.6.4 Key Factors of BULCon

The following key factors can be considered in the BULCon:

- Funding for managing consortium affairs and electronic resources subscription;
- Cooperative print collection development;
- Cooperative electronic collection development;
- Union database development;
- Union Repository;
- Proper mechanism of ILL/Document delivery;
- Networking infrastructure;
- Technical support in library automation;
- Manpower development;
- User awareness to use e-resources;
- Local hosting of contents;
- Expanded access beyond locally held resources;
- Seamless links from resources to resources;
- Ensures optimum service with minimum budgetary support;
- Commitment of participating agencies;
- Providing valued product and services;
• Reasonable, understandable, equitable fees;
• Providing products to meet particular needs;
• Stability;
• Continuing, regular funding;
• Comparable benefits to all members, especially cost saving;
• Flexible in meeting changing needs;
• Committed, quality, stable staff;
• Effective, prompt instruction and help;
• Effective governance with equitable decision making;
• Quick effective communication among members and staff;
• The journal title for which the consortium license is negotiated are subject-focused;
• The model is a worked act for cross access to the print journals subscribed by the members of the consortium and hence, gives equal access to all the members.

5.6.5 BULCon for Interlibrary Traditional Resource Sharing

Diagram-5.1
BULCon will be acting as an agent of traditional or printed material resource sharing too. This type of resource sharing will be performed by the following media:

- Photocopy or printed materials will be delivered by postal or hand delivery;
- Facsimile for short documents sharing;
- Scanning the printed materials and sharing as an e-mail attachment or e-docs from definite server spaces;
- Oral information over telephone or any other relevant media;

5.6.6 BULCon for Interlibrary E-resource Sharing
The following items are to be considered by BULCon for e-resource sharing:

**E-Resource Procurement:** BULCon will be a medium for procuring the e-journals for the consortium members to reduce the purchasing cost for individual level.

**E-Repository:** BULCon can provide the e-repository facilities for consortium members and it can help the individual members to host and building their institutional repositories. Or it can connect the individual repositories.

**Central Hosting:** BULCon can play a key role as internet service provider (ISP), it can provide the server spaces for the members, with a minimum cost or without cost. It can use DNS server.

**Central Gateway:** BULCon will play a great role as a Bangladeshi University Library Gateway. It will form a single user interface to provide the members links or the accessible Meta data harvesting facilities. It will be treated as incoming and out going gateway. It will provide a single identity for the BULCon member with a single gateway IP at the time of searching, downloading from the procured e-journals.

**Central Database Service:** BULCon can provide the central database services. It can build a network of Bibliographical records. It can develop or procure a standard ILMS for its members.
BULCon can join with any other consortium in Bangladesh or abroad. The option for the future expansion should be considered at the time of formation of BULCon. The above diagram has shown an imaginary expansion of BULCon with the special library consortia (A combination of Medical, Technological and R&D Library Consortium). Here it is shown as BERCon (Bangladesh Education & Research Consortia). In this imaginary diagram the investigator has shown the options of joining with the like minded consortia to fulfill its objectives.
The direction of the further study can show the path to the future researchers. Each and every researcher has some limitations and none can reach the absolute target. This researcher has limitations too; some of the limitations are discussed at the first chapter of this report (section 1.3.2). Limited timeframe, dearth of fund and data, widely dispersed samples/ populations are some of the crucial factors which heavily influenced the researcher to limit the scope of this investigation. In preliminary survey, questionnaires were sent to 80 university libraries of Bangladesh of which only 67 (83.75%) libraries responded with their feedback. As a result, the current state of IT application in different in-house activities and services of more than 16% of the university libraries could not be included in the present investigation. The final survey of this investigation have been carried out on some selected university libraries, this selection was made on the statistical ranking logic. So, the final survey dropped out some of the university libraries. For the paradoxes of the statistical method, there were not enough chances to include all the university libraries of Bangladesh. Therefore, the future researchers may include the entire population of university libraries or entire public or entire private university libraries in his/her study.

Secondly, the study concentrated only on the overall IT applications in the university libraries of Bangladesh. This investigation could not touch the extensive services of IT like-institutional repositories, digital library services, software aspects, metadata aspects, knowledge management aspects, library 2.0, web 2.0, metadata harvesting, open access initiatives, etc. The future researchers may carry out their projects on any of these in wide range of IT applications in the university libraries of Bangladesh.

Thirdly, a joint investigation or a group of researchers can carry out researches in future to provide a more comprehensive and comparative study on application of IT in different library systems such as Public, Academic, Special/Technical libraries of Bangladesh, which will help the library planners and administrators in Bangladesh to
integrate these libraries through appropriate networking, so that the Public Information System could be strengthened.

_Fourthly_, the future researchers may conduct one or several specific studies exclusively on users of the university libraries to retrieve their opinions on quality and need based services point of views, which will go a long way in re-engineering university library systems in Bangladesh.

_Fifthly_, the present study is more generic as it focused on the overall status of use of IT in university libraries of Bangladesh. The future researchers may explore more fields where IT can be applied for better services.

The aforesaid areas are only some indication. Necessity will run the force of exploration, by which the future researchers will carry out their researches. The investigator is hopeful enough that the future researchers will expand the horizon of the libraries and its services too.

**Reference**