CHAPTER V

MAJOR FINDINGS AND CONCLUSION

5.0 INTRODUCTION

The main aim of this study is to analyse OPACs to find the current status of the OPAC as well as the problems faced by the OPACs in the Google age. To accomplish the task of the research objectives, researcher initially evaluated the general features of OPACs of the selected samples. Subsequently characteristics of Amazon and Google were taken into consideration to further explore the potential of OPACs. Other research studies in this field also ascertain the need of this kind of researches to enable the OPACs as a tool to find the required information, which could be found in the review literature section. This chapter summarises the major findings and recommends a new theoretical framework as the research outcome.

5.1 MAJOR FINDINGS

5.1.1 Advancements in Library Catalogues

i. This research study reveals that many OPACs are dealing with e-books (59.46%), CD-ROMs (64.87%), sound recordings (67.57%) and video (70.27%) (Table 4.2.2a). 22 OPACs (59.5%) are providing link to bibliographic databases (Table 4.2.2b). These are all positive sign in the cataloguing world.
ii. 72.97% of OPACs in this sample are permitting their customers to access them from anywhere (Table 4.2.3). It is impractical in the predawn of computer era.

iii. 36 OPACs (97.30%) out of 37 OPACs are having keyword search option and 28 OPACs (75.68%) out of 37 OPACs are having Boolean search facility (Table 4.2.4), which are all significant developments and the expectation of the Internet savvy users.

iv. To find the information precisely, relevance ranking is one of the important elements which is present in 27 OPACs out of 37 (72.97%). Modify search will simplify the information searching process and save the users time. 24 OPACs (64.8%) are having modify search option. 86% catalogues (32 OPACs) of this sample consists of current status feature (Table 4.2.5). These are notable developments.

v. It could be observed from Table 4.7.1.2 that email (85.71%) (24 OPACs), save (85.71%) (24 OPACs) and help (89.3%) (25 OPACs) features can be seen in a majority of OPACs, which again underpin the development of OPACs.

vi. Inclusion of book cover image is another new trend. Table 4.7.2.3 shows that OPACs are now adopting this idea. 50% of OPACs (14 OPACs) are having book cover image.

vii. The ‘Table of Contents’ feature can be seen in 15 OPACs (53.57%). Most of the OPACs (78.57%) (22 OPACs) deal with different types of
information resources (Table 4.7.2.3), which are all remarkable advancements. Even though, the efficiency of handling multidimensional information resources requires more attention, which has been observed while searching information from the selected samples.

viii. Login (96.4%) (27 OPACs), saved searches (92.86%) (26 OPACs) and search history (78.57%) (22 OPACs) options are available in most of the OPACs of this sample. These features assist the users to continue their search without any difficulties and follow up can be done without any problem (Table 4.7.2.6).

5.1.2 Problematic Areas

Apart from these advancements, this research study has also divulged the following challenging areas:

ix. As per this study, current cataloguing rules don’t have options to include journals at the article level. The fields used for analysis have been taken from the LOC OPAC. All fields are merely bibliographic information (Table 4.2.1b). The reason for unable to provide information from periodicals is due to the cataloguing standards for example AACR2 are based on the principles of pre-machine period.

x. As per the table 4.2.4, content search is offered in only 3 OPACs (8.11%), another important entity missing in most of the OPACs. It means OPACs should search inside the documents for the submitted
query. It is an important criterion to be pondered in order to improve search facility, which is feasible in the information technology world. It enhances the retrieval of relevant records.

xi. Federated search functionality is present only in 4 OPACs (10.81%) (Table 4.2.4). This feature should be as built-in functionality to search all resources concurrently to provide better access to information.

xii. Only 8 OPACs (21.6%) of this sample have stemming of words feature (Table 4.2.5). This facility can fortify the information searching capability of the library catalogue.

xiii. Open sources (10.81%) (4 OPACs) (Table 4.2.2a), links to digital library (16.22%) (6 OPACs) (Table 4.2.2b) and links to search engines (27%) (11 OPACs) (Table 4.2.5) are essential to expand searching beyond its limit. Appearance of these features in a handful of OPACs of this sample is a good indication of the developments, but the concern here is the rate of speed of implementation of these features in all OPACs to enhance their potential.

xiv. Table 4.7.1.1 illustrates that all elements other than Proximity search (10 OPACs) (35.71%) and Stop word removal (13 OPACs) (46.43%) are present in almost all OPACs. Proximity search and stop word removal facilities can simplify the information searching. Cataloguers should try to include these kinds of features to empower OPACs.
xv. 13 OPACs (46.43%) have implemented faceted navigation (Table 4.7.2.1). This new approach creates opportunity to search information in various ways, but it should be implemented in all OPACs.

xvi. Most of the OPACs in this sample do not have spell check provision. Only 7 OPACs (25%) have this key feature (Table 4.7.2.1). OPACs are lacking behind in utilizing the presently available technology to include this facility.

xvii. Professional reviews certainly provide a clear picture about the particular resources, but it appears only in 6 OPACs (21.43%). Similarly only one OPAC (3.6%) in this sample has ‘Excerpts’ and ‘Popular and Recommended list’. ‘Summary’ can be seen in 12 OPACs (42.86%) (Table 4.7.2.3). These are all evidences for poor content enrichment. It is perceptible from this result that professional reviews, excerpts, and most popular and recommended list are other areas to further upgrade the OPACs. Amazon has these features, which augment its capability and provide a new searching experience to the users.

xviii. As per the result shown in Table 4.7.2.4, a majority of OPACs (17 OPACs) are having fair accessibility and 8 OPACs are having poor accessibility. Good accessibility in OPACs can ease browsing and navigation process. This study emphasizes that keen attention should be paid to create OPACs with excellent accessibilities.
xix. The Table 4.7.2.5 depicts that less importance is given in OPACs for user participation. The OPACs are not ready to accommodate these features to bolster the user participation. Only one OPAC (3.57%) has ‘rating’ and ‘forum’ options. 5 OPACs (17.8%) are permitting to upload the users views and comments. Tags option is offered in 3 OPACs (10.71%). To put it in a nutshell, most of the OPACs are not designed to incorporate these innovative ideas to come out of the conventional boundaries.

xx. 85.71% of the OPACs (24 OPACs) don’t handle personalised recommendation and RSS feeds (Table 4.7.2.6). It is another setback in the library cataloguing in using modern technology. RSS feed is indispensable to make OPAC dynamic and also to update the users.

xxi. Regarding the utilisation of social networking, as per Table 4.7.2.7, only 2 OPACs (7.14%) of this sample are equipped with this kind of tool. Cataloguers should consider these drawbacks to make its presence in the pool of social networking to reach the users effortlessly.

These findings are crucial to improve the scope of the library catalogue and reinforce the fact that there is a wide gap to reach the level of Amazon and Google, even though; this study witnessed remarkable developments in the library cataloguing. No OPACs can search beyond its limit like Google. Ability to meet the needs of the hours, adoptability and sustainability are to be contemplated while redesigning the OPAC.
5.2 THEORETICAL FRAMEWORK OF THE STUDY TO DEVELOP OPAC

Perception of these studies confirms that the developmental activities in the cataloguing world are in a linear fashion, but this kind of approach is not adequate to revitalise the library catalogue. A multifaceted approach should be categorically adopted to change the landscape of the catalogue. The outcome of these studies confirms the inevitability of a need based approach to redesign the library catalogue. This section proposes a new framework by specifically addressing the shortcomings found in the previous sections of this research studies.

All research studies continually proved that the future OPAC should have the following qualities for its sustainability and also to regain its old grace:

- Intuitive and User-friendly Catalogue
- Impressive interface and better accessibility
- Able to handle all kind of resources
- Characteristics of Amazon
- Ability to reach beyond its own resources like search engines
- Web 2.0 features
- Extraordinary Information searching efficiency
- One stop shop for information discovery

OPAC should consist of the features identified by the researchers to have the above qualities. Other research studies in this field also support the findings of this research, which have been given in detail in the review literature part. Utilisation of
current technology and introducing new amendments in the cataloguing standards are the two ways of approach to modernise the catalogue. Keeping these aspects in view, the researcher proposes a new framework to develop the library catalogue with all required elements and also to continuously enhance the calibre of library catalogue. The proposal discusses all required features whether they are already encompassed or not. This new framework recommends all the essential components.

Framework has two major sections, in which the first section deals with essential functionalities, and the second section describes the way of implementation and rationales.

5.2.1 ESSENTIAL FUNCTIONALITIES

The key functionalities for the next generation library catalogue are listed out here as per the authors’ research study to develop an ingenious catalogue. This list will grow or change from time to time because of the rapid developments in the information technology field. Many new sophisticated features may appear soon and at the same time some of the existing features may become obsolete. The catalogue professionals should consider these technological advancements during the development of their catalogues to entice the users to use OPAC as a worthwhile tool.

The list has been divided into two categories as per the findings of the research. The first list shows areas which have been already incorporated in most of the OPACs. The functionalities mentioned in the second list are available in very few OPACs of the sample, where more focus is required. These facts have been observed from the samples at the time of research studies performed.
Features incorporated in most of the OPACs:

1. Inclusion of different type of information resources
2. Remote access facility
3. Keyword search and Boolean search options
4. Relevance ranking
5. Modify search option
6. Current status of the document
7. Email and Save options
8. Book cover image
9. Table of contents for books
10. Login, Saved search and Search history features

Challenging areas:

11. Handling of periodicals in the article level
12. Content search
13. Federated search
14. Stemming of words
15. Links to open sources, search engines and digital library
16. Proximity search
17. Stop word removal
18. Faceted navigation
19. Spell check
20. Professional review
21. Excerpts
22. Popular and recommended list
23. Summary
24. Accessibility
25. Rating
26. Forum
27. Users’ review comments
28. Tag
29. Personalised recommendations
30. RSS feeds
31. Social Networking
32. Similar results (not included in the analysis)
33. Alert Service (not included in the analysis)

5.2.2 IMPLEMENTATION PROCEDURE AND RATIONALES

Introducing new rules and fields in the cataloguing standards will help to add some of the above features. However other required features can be integrated with the help of the advanced computer technologies in the design stages of OPACs. A versatile OPAC can be developed with the use of Web technologies such as mark-up languages, client side scripting language(s), server side scripting language(s) and RDBMS. The user interface design could be done with the use of mark-up and client side scripting languages such as HTML 4.1, XML, Cascading Style Sheets (CSS), jQuery, AJAX, etc.,. Choice of RDBMS is based on the existing database system used in the current OPAC applications. It could be combination any of the following such as Oracle, MySQL, SQL Server, DB2, etc. Server side scripting languages could
be any one of the following such as PHP, JSP, ASP.NET, RUBY on Rallis, etc. Developing OPAC applications with PHP and MYSQL combination will ease the process because these technologies are open source and have better connectivity. SQL Server and Oracle databases are commercial RDBMS with more features. Ultimately, all the features mentioned under the ‘Essential Functionalities’ heading can be incorporated in OPAC both by introducing new rules in the cataloguing standards and by using these programming languages. All the features are grouped under eight topics based on their natures for the systematic way of implementation in the theoretical framework.

i. **Modification in the Cataloguing Standard**

Competency of the library catalogue should be enhanced to handle its own print collection as it is still dominating in the academic environment. Library of Congress’s (LOC) proposal of including Table of Contents (TOC) is one of the ways to enrich the catalogue. TOC of books is present in many OPACs of the selected samples. In MARC 21, field 505 is used to include TOC. Similarly TOCs and abstracts of journals should be included in the catalogue, which is unavailable at this moment. Fields are to be created in the cataloguing standards for this purpose. Now, inclusion of TOCs and abstracts are possible because most of journals are published both in print media and electronic media, which helps to download the TOCs and abstracts from their electronic version counterparts. In addition to that, advanced level scanners are available to scan TOCs and abstracts in the readable format such as Word and PDF. The full text is essential to handle the periodicals in article level. If
the library subscribes to e-journals, provision should be created on the OPAC to access full text from the retrieved results.

Figure 5.1: Table of Contents for books

( http://catdir.loc.gov/catdir/enhancements/fy1205/2010938789-t.html)

In addition to that, Book coverage image, professional reviews, summaries and annotations should be included in the cataloguing standards as these fields now begin to appear in the latest OPACs and helps the users in finding the relevant documents. Ultimately it will help to enrich the bibliographic records of our library catalogue. These fields can be downloaded from publishers’ websites, Amazon and also from other resources to include in OPAC. Adding these fields in the library catalogue should be considered while revising the cataloguing standards. Metadata currently available in cataloguing standards cannot give information. Hyperlink provision to full text in the cataloguing standard will be the solution for this problem.
To manage the speedy changes in the computer field, cataloguing standards should not deal only with how to catalogue information resources, but also should have technology details to build next generation library catalogue as a separate section in the cataloguing standards, which is the need of the hour. This chapter should have the information about the new features to be included and should explain how to use the computer programming languages to add those new features in the OPACs. It will give perfect idea to develop OPACs for their own needs. When we make this information is available in the cataloguing standards, it will pave the way for standardisation in developing the library catalogue and guide the cataloguer to create OPAC with the international standard.

As the technology develops fast, this section should be updated continuously. In the current circumstances it can be done in various ways. Creation of blogs and discussion forums are some of the ways to find the latest technological developments, which will enable the cataloguing experts to take part in the discussions and share their expertise, experience, problems and views. These information could be collected periodically by the respective cataloguing standard teams for updating after filtering the unnecessary items. It will support small and medium size libraries to develop their OPACs at par with other big libraries. If we follow this strategy, it will facilitate everyone to take part in the developmental activities of catalogues. Collaborative efforts will become feasible and will ultimately lead to take massive steps towards the modernisation of OPACs.
Figure 5.2: Book cover image (http://www.amazon.co.uk/Engineering-Mathematics-K-Stroud/dp/0333919394/ref=la_B001HQ5NRQ_1_4?ie=UTF8&qid=1357974436&sr=1-4)

Figure 5.3: Users Review (provision has been given to enter users review)
(http://catalog.library.wmich.edu/vufind/Record/164121/userComments#tabnav)
ii. **Handling of Electronic Resources and Open Sources**

As the collection of the library comprises both conventional and nonconventional resources, the library catalogue should be designed to handle all its resources efficiently mainly to retrieve required information. Federated search facility is to be integrated for searching simultaneously the print collection, e-journals, e-books, online databases and its digital repositories to give unsurpassed access to breadth and depth of information. The e-resources are not the part of OPAC in the present setup as per this research study and have to be searched separately. The critical issue is electronic resources are not like print format resources. Most of the e-journals and e-books cannot be treated as an individual element and are part of electronic databases. Cataloguing them is not practicable and not needed because all fields become access points. In addition, full text search is possible for the user query. E-journals, e-books, databases, bibliographic information and digital repositories should be indexed into a single data store and made available for the users’ query through OPAC. Apache Solr can be used for indexing and searching records. The result should be displayed with hyperlinks to access full text of the retrieved results. PHP or ASP.NET sort of programming languages can be used to get done these provisions. This single search facility can break the barrier and can draw the attention of the users. Developing OPACs with this capability will increase the importance of the library catalogue.

Now tools for federated search is available commercially for example Summon. Summon treats OPAC as one of the elements along with e-books, e-journals
and online databases while searching for information. If we don’t develop our OPAC as a well-designed tool with federated search kind of capabilities, OPAC will lose its significance and will sink in it. Instead of finding some new tool to retrieve information from OPAC, e-resources subscribed by the library, open sources and digital library, OPAC should be developed to perform this paramount task. OPAC should be an information rich tool as well as gateway for information for the library patrons.

Open sources are available plenteously and ever growing on the Internet for all subjects. Library professionals must be able to identify the relevant open sources for the core subjects of their parent organisation to incorporate in the OPAC. Directory of Open Access Journals, BENTHAM OPEN and Hindawi Publishers are some of the examples for open sources for journals. Alike open sources for books are available for example Directory of Open Access Books, OAPEN Library (Humanities and Social Science), Bookboon.com and FreeTechBook.com. Metadata have to be harvested for this purpose from these resources and should be indexed for searching. Tools are available to harvest metadata for example free OAI-PMH tools, Public Knowledge Project Open Archive Harvester and Virginia Tech Perl Harvester. Searchable index can also be created. Indexing engines like Lucene is another breakthrough in this field to create indexes. The current technology eases the process of indexing and integrating them with OPAC for searching. Results can be displayed with hyperlinks to access full text of the retrieved results. Besides Google books, Google Scholar, Scirus type of search engines, and Amazon are to be searched by the library catalogues. It can be accomplished with existing coding or with less coding.
iii. **Additional Features to Enhance Information Searching**

Information searching capability is the most fundamental quality to judge the performance of OPAC in line with other information mediation tools. Ultimately it paves the way to maximise the utilisation of all resources and to obtain the information beyond its limit. More attention is to be paid to make OPAC as a prevailing information searching tool to compete with Amazon, Google and other similar nature of products. At the same time, the searching should not be complex in nature and should not frustrate the users. To accomplish this onerous task, a single search box like Google search box must be created for common search. It should be as effective as Google search box and should search all fields including full text to satisfy both novice users and experts. Apart from this, advance search option with various combinations of searches including Boolean search option should be included for the benefit of experts. C++ programming language can be used to create this facility. Python, Java and .NET programming languages can be used as frontend languages for the same. Faceted navigation and similar results search mechanism support the users to narrow down their search. The proximity search option is to be refined for its effective application. These features can be made available with their full potential by Apache Solr and Lucene.net. Apache Solr is a blazing fast, scalable, open source enterprise search server built upon Apache Lucene.
Figure 5.4: Faceted Navigation

(http://catalog.lib.ncsu.edu/?Ntk=Subject&Ntt=%22SCIENCE+%2F+Mechanics+%2F+General%22)

Similar Results

<table>
<thead>
<tr>
<th>Book Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Development Handbook</td>
<td>Dewberry</td>
</tr>
<tr>
<td>Wastewater Treatment Plants</td>
<td>Syed R. Qasim</td>
</tr>
<tr>
<td>The Civil Engineering Handbook, Second Edition</td>
<td>Wai-Fah Chen</td>
</tr>
<tr>
<td>Water and Wastewater Calculations Manual</td>
<td>Shun Dar Lin</td>
</tr>
</tbody>
</table>

Figure 5.5: Similar Results

(http://www.amazon.com/Environmental-Engineering-Joseph-Salvato/dp/0471418137/ref=sr_1_1?ie=UTF8&qid=1357976197&sr=1-1&keywords=%22Environmental+engineering%22)
Stemming of words and stop word removal features can too augment the information searching process. Software coding or third party tool is required to accommodate these in OPAC. In the same way the dictionaries can be incorporated for spell check functionality. .NET, Java, Python and C++ can be utilised to write programmes to have them in our OPACs. It is obvious from this study that the information searching capability of OPAC purely relies on the computer technology and not on our cataloguing standards. Therefore, the library professionals should be ready to use the computer technology to build modernised OPAC.

iv. Relevance Rank

The system should display the retrieved results based on relevance ranking. Matching of the search terms can be considered with various access points such as subject headings, article titles, and author name as well as matching with abstracts and full text. Relevance Ranking Technology such as “term frequency – inverse document frequency” algorithm can be applied to obtain the results on the first page of the results itself. Circulation data, list of recommended books for all subjects, popularity and users’ comments can be augmented to judge pertinence of a resource especially in the academic environment. When users login for searching, their search history should be contemplated with users query to increase the precision level of retrieved results.

v. Display of Results

Display of results should be understandable as per users’ whim. Modify search option for the front end delivery of retrieved results is obligatory. These properties are
already present, but they have to be fine-tuned to ease these processes. Specific area to save the searched results by the users and able to re-run the saved results are also to be part of OPAC. The library catalogue should go beyond the realm of the users’ expectation to boost up the discovery experience. These characteristics can be infused with OAPC by using the current web technology.

vi. Good Impressive Interface

“Most of the designs of OPACs interfaces are not that much effective in helping the users during their search for information. Interface designs in OPACs are less user-friendly and would not allow interactivity with the user during their search sessions. OPACs are one of the highly visible end user searching tools” (Mboni Ruzengea, 2012). The interface is playing a crucial role in attracting the users towards the library catalogue. It should be grafted as attractive, responsive, intuitive, concise and efficient one. Advanced web designing tools and multimedia components are currently available to develop aesthetically pleasing interface. jQuery, AJAX, CSS and JavaScript are widely used to create intuitive, impressive and user-friendly interface. While developing OPAC, the developer should develop the OPAC to comply well with WWW consortium’s HTML standards, which will improve the accessibility of OPAC.

vii. Alert Service

Many online databases are providing Alert Services to their customers in their field of interest. Google Scholar too offers this service. Server side scripting languages make it possible. Offering this service to the users will make them more
dependable on the library catalogue. Alert service is a potential service, which eases the selective dissemination of information service. No one could have imagined this sort of services in the card catalogue era, which was a daunting task. SQL statements can interact with database. Servlets provide user account authentication and transaction control logic and the capability to run jobs at future times and also to send email message via Java mail. Many other open source mail systems are also available now to perform this task.

viii. Personalised Services

Personalised services such as search history, email, print, save, rating, users’ review, tag, personalised recommendations, forums, RSS feeds and popular list can be added in the design stage of OPAC with the help of Server side scripting languages and database. Adding these features can make OPAC as an interactive and dynamic tool, for example users can tag the library books and can take part in the cataloguing. When patrons search the OPAC, tag clustering enables them to find the relevant information.

Users’ review is another criterion to identify the pertinent resources. It is a dynamic field and needs continuous monitoring. Professional collaborations among the users through OPAC are practicable by introducing these services.
Figure 5.6: Email, Export Options (https://catalog.library.wmich.edu.vufind)

Figure 5.7: User Ratings (http://www.amazon.com/How-Computers-Work-9th-Edition/dp/0789736136/ref=pd_sim_sbs_b_5)
The library catalogue should create RSS feeds for users to subscribe to update them with the latest additions in OPAC for example new books, new contents and new services. The libraries should embrace this technology to energise the Current Awareness Service. These services are nowadays embedded in social media websites. Tools and scripts are available to include RSS feeds. The latest programming languages for example PHP also support to create this option. Furthermore compatibility of OPAC with mobile phones has to be considered while developing the OPAC as it is an upcoming trend. This has not been taken into account while analysing. Mobile apps to be used in all major mobile platforms can be developed by the libraries with the help of current computer programming languages for example JavaScript and CSS. Some open sources like Kurogo and Android are available to develop mobile applications. The mobile technologies make the OPAC ubiquitous. These facilities are expectations of the Internet savvy users and can be made available in the library catalogue without making any change in the cataloguing standards.
Likewise, OPACs can be integrated with social networking such as Facebook, twitter etc. OPAC will be permanently placed among the library users and users can freely access OPACs on these social networking websites. Excerpt is yet another service to be deployed, which can penetrate into the document for pertinent information. As everyone looks for information rather than documents, this service gets its impetus. Amazon and Google books and our own digital collections can be utilised to implement this service with proper coding while developing OAPC. Proper indexing, searching and optimization techniques will help to speed up the data retrieval process. As per this framework, state-of-art OPAC can be developed with all necessary components with the assistance of appropriate computer programming languages and by making necessary modifications in the cataloguing standards.

5.3 SUGGESTIONS

1. International level collaboration among the cataloguers is another way of approach to share their expertise for the continuous enhancement of library cataloguing.

2. Cooperation among libraries at least in the regional level to share their catalogues will also augment the developmental activities. The libraries should permit to harvest their metadata including new fields such as book cover image and table of contents. This process will reduce the burden of small and medium libraries to create an informative OPAC. Steps should be taken to create interoperability among OPACs to augment this process.

3. OPACs could be indexed in search engines for example Google, Yahoo and Bing for its global presence and also for everyone’s access. This will lead to develop a modernised library catalogue.
4. Otherwise, initiative may be taken to create a search engine exclusively for OPACs, where all OPACs should be indexed with the permission to access them fully without the copyright infringement. Available computer technology makes it simple and doable. Taking this sort of projects can keep the library catalogue current in the information seeking world. International library associations can play central role in this initiative. Each library can instantaneously know the developments in the cataloguing world from a single platform and can implement them to renovate their own catalogue for its effective functioning.

5. Once OPAC is revitalised, it is duty of the library professionals to create awareness about the new OPAC among the library users to move towards the library. Information literacy classes will certainly help to create the culture of using the library catalogue.

6. Regular usability test is to be conducted to find the pros and cons of our library catalogue.

7. Technology helps to create Apps to use some of the functionalities such as OPAC in mobile phones, OPAC in Social networking. These apps can be created by the library professionals or by library professional societies or by big libraries as open source to make use of them by all libraries which will eventually empower the library catalogue.

8. Apps related to OPAC should be pooled in one place for everyone’s easy access. Library cataloguing standards websites or library professional
societies websites could be used for this purpose. This arrangement will enable all libraries to utilise the apps in the same way.

9. Web 2.0 functionalities included in the theoretical framework are not limited. Many other web2.0 functionalities can be further added such as folksonomy, flicker, podcast, wiki etc. based on the necessity of the particular library. This framework demonstrates the possibility of including all this sort of features in OPAC.

5.4 DIRECTIONS FOR FUTURE RESEARCH

This research study has concentrated on features of OPACs of major academic institutes in GCC nations and does not cover the entire cataloguing world. Hence, OPACs of different parts of the world should be meticulously studied so that it will support to dig deep to explore the strengths and weaknesses of the library catalogue. The results have been discussed in the context of this research study. Similar research investigations with OPACs of other part of the world are to be conducted with paramount importance to add more value to the cataloguing research and also to speed up the upgrading process in OPAC.

In the fast developing world, it is hard to predict the next biggest change. Cataloguers should be always vigilant to constantly update OPAC in line with other information discovery tools for its sustainability and moreover to meet the upcoming new demands from the users’ side. If it does not ensue, the library catalogue will be an obsolete tool. Advent of semantic web technology and cloud computing can be pointed as examples of such kind of developments, which spread their wings into
many fields and will also influence in handling information. Therefore the library professional should begin to ponder to use these technologies too in our library services. Likewise, many more new technologies will emerge and dominate. We have to be in position to adopt these technologies in our field to continuously able to provide required information. Hereafter, if any new device dominates in the communication world like mobile phone, the catalogue should be made compatible with the new device. If some new format of information resources emerges in future, cataloguing standards should be upgraded to handle the new format of information resources successfully. Ultimately, redesigning should be a regular process. These progressions should be taken at a faster rate to surpass the other information discovery tool. Otherwise they will take a lead role and the library catalogue should follow their path. We should be proactive in accepting the changes in the information world. At present, OPACs represent only smaller portion of the information. The proposed framework expands its horizon to a reasonable extend, but still it could be expanded to the large extend to make OPAC as a single gateway to obtain information for its customers. New researches in this direction will help to attain this stature and will make OPAC as a relevant tool forever. As the future of information technology field and scholarly publication are very much promising, library catalogue will be in a position to face many challenging tasks. Finally that trend will lead to consistently pursue more researches in the field of library cataloguing to rejuvenate OPAC for its viability.
5.5 CONCLUSION

The research study considered the current state of the library catalogue in the light of modern users’ expectations, general features of OPAC; and impact of Amazon and Google. The findings of this research compel the need of total revival in the library catalogue. Besides, it ascertains the fact that the cataloguing standards are not having adequate rules to accommodate new format of information resources and are incompetent to provide the required information. Re-examining the function, design and usefulness are to be critically deliberated for invigorating the library catalogue. In addition, this research study stresses the point that research activities are to be accelerated to revamp the library catalogue to keep the pace of the developments taking place outside the library world in handling information.

Improvements of OPAC are not dependent only on cataloguing standards like before. The role of computer technology is predominant in making a powerful online catalogue. Bridging both the latest technology and cataloguing standards is the ultimate way to redesign the library catalogue. The researcher recommends a new framework in this research study to create such opportunity. The ultimate aim of this framework is to develop OPACs to keep the market demand. The creation of OPAC with all essential qualities is possible as per this research study. The proposed theoretical framework ostensibly opens the door to develop a full-fledged library catalogue with the ability to adapt the rapid technological innovations.