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Proposed Integrated System for Library Services and Online Education: A Pakistani Perspective

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Abstract:

Purpose: Education is the basic need of each community member and educational institutions play a vital role in the development of any community and country as a whole. Also, libraries plays significant role in educating people or fulfilling educational needs of the society members. COVID-19 pandemic affects all sectors of life including educational institutes. However, libraries play dramatic role in the delivery of electronic services like e-thesis, e-books, e-research articles and virtual reference. The proposed study will provide a step-by-step guideline to individual researchers, research organizations, educational assessments organizations, government departments and policy development departments to plan and execute such innovative projects for the betterment of the educational system in the country. Similarly, libraries will get benefit to engage officially in providing e-services to community members. Through this proposed proposal the researchers may be able to identify the current status of educational institutions and their libraries in Pakistan in terms of educational institutions' and their libraries strengths, weaknesses, opportunities, and threats for the delivery of online educational programs and e-services of libraries during COVID-19 pandemic or in such other accidental situations.

Research Methodology: The proposed study will be conducted through Explanatory Sequential Mixed Method Research to meet study objectives.

Practical Implications: The proposed study will help in identifying strengths, weaknesses, opportunities, and threats to online educational programs and e-services of libraries. Also, propose suggestions to educational institutions and libraries on the basis of identified strengths and opportunities for their better utilizations. Similarly, it will identify the issues like weaknesses and threats to online educational programs and libraries in universities and will propose strategies for covering such deficiencies for the smooth delivery of online education and library online services while utilizing the existing resources. Also, benchmarking other developed organizations and may introduce resource sharing modules among different organization to overcome less developed organizations deficiencies while utilizing developed organizations existing resources.

Keywords: *Online Library Services, Online Education System, Libraries in Covid-19, Education during Lockdown, E-Services – Libraries, Academic Libraries, Libraries – Learning Management System (LMS), University Libraries.*

Introduction:

Education is the basic need of each society member to understand and survive in the society. Also, it is the education that enables society members to work for the betterment of their society and country as a whole. But the Covid-19 pandemic shutdown all educational institutions like schools, colleges and universities that creates long gap among society members and educational institutions. After a long shutdown of educational institutions i.e. around six months; educational institutions start working on how to engage their students and employees by offering online education. Libraries also introduced so many online library services to engage and satisfy

library users by providing their requested materials in e-formats. Also, HEC digital library program provide user name and passwords to universities to provide easy access to digital resources. In such way educational institutes community members were engaged to start their academic working by saving the time and finances. Also, it helps the community members to mentally engage them in healthy activities to secure their mental state safe from the worries of the Covid-19 pandemic.

Each educational institute has started working on introducing online education modules. Also, review the existing resources and infrastructure to offer online educational programs for the engagement of students, staff, and faculty members.

Online Library Services:

Many universities in Pakistan have developed Learning Management Systems (LMS) for instructors and students for conducting online classes. A previous study elaborated that by collaborating the administrator of LMS, the link of library resources can be displayed in Learning Management System (LMS) (Davis, 2018). Libraries in Pakistan are providing online services through different methods. Rafique, Batool, Ali, and Ullah (2020) described that Pakistani libraries restored their libraries web page, update the list of resources in order to providing services to students during COVID-19. University libraries also provided robust services through online strategies.

Farkas (2015) stressed the role of libraries in LMS as the library needs to be present in the LMS in order to be proactive in the online classes and learning. Davis also discussed to make place for library in LMS. Researcher stated that initial level, make efforts to show the word library in LMS by placing a link of library. At the next stage library page can be integrated with

each course template (Davis, 2018). Based on discussion from previous literature about the presence of library in LMS, we included library module in proposed LMS (Figure 3).

Online Education:

Education is the process of receiving or giving systematic instruction especially at school or university. Education either basic or higher level both plays great role in the development of the country that increased the social, economic, and political status of the country. The education approach which associated with distance education, cognitive science, human interaction and digital technology are called online education. Although different terms such as "e-learning," "distance learning," "distance education" and "online learning" have also been used for online education.

Lee (2010) defined that "online education is the educational approach facilitated by social learning and information technologies that allow communication between instructors and students via ordinary interaction". Bebawi (1953) also defined online education as: "it is the creation and proliferation of the personal computer, the globalization of ideas and other human acts, and the use of technology in exchanging ideas and providing access to more people. Audio, video, computer, and networking technologies are often combined to create a multifaceted instructional delivery system". Online education significantly vary according to the scope and critical features, it saves the students time and cost. It gradually replaces the traditional teaching method at higher education institutions.

Martinez (2004) briefed that online education has two types of learning which are asynchronous and synchronous. In asynchronous online education, students don't need to interact or directly communicate with teachers/mentors. They have to complete their assign tasks between the specific schedule and deadline. This type of online education is popular due to the

individual control over time. In Synchronous online education, students and teacher who are geographically dispersed interact each other through information communication technologies such as audio/video and text based software. Synchronous online education is most popular type in academic institution, especially, after COVID-19.

Online Education Systems (OES):

Integration of web based technologies has increased the competitive environment of the higher education sector in last two decades. The Online education system (OES) has fascinated the people to enhance their knowledge and skills without disturbing their regular work routine. The OES has dramatically change the education paradigm from traditional to online classroom and making education more feasible. Paulsen (2002) quantified that online education system (OES) is a chain which is joint together with four systems included:

1. Content Creation Tools (CCT)
2. Learning Management Systems (LMS)
3. Student Management Systems (SMS)
4. Accounting Systems (AS)

OES is also known as Jigsaw model which shows that this system should fit together to transfer data without seamlessly.

1. Content Creation Tools (CCT)

Content creation tools (CCT) are designed to create, edit and publishing the learning material (Embi & Hamat, 2005). The examples of CCT systems are FrontPage, CorelDRAW, Photoshop, Dreamweaver, Word, PowerPoint, and macromedia DIRECTOR. These systems have different kinds of contents such a pictures, slides. Graphics, plain text, assignment and audio/video materials. CCT tools are developed especially to support and development of the online education programs. Embi and Hamat (2005) investigated that WeB-CEPT is the best content creation, editor or publishing tool for the

learner's. It helps the learners to create online HTML document and save them in educational portal. It is helpful for text editing, create hyperlink and insert images. However the latest technology and wave of COVID-19 pandemic introduced the latest content creation tools (CCT). Erlandson (2021) highlighted the top content creation tools which included: Prezi Video (video content creation tool), Slack (instant message and share content with others), Zoom (Video conferencing program), Grammarly (word process tool), Creatopy (image editor), Dropbox (storage of data) and Google Workspace (web based storage with content creation tool). These are best and quick content creation tools which help you to visual representation and improve the content of your piece of work.

2. Learning Management Systems (LMS)

Learning Management Systems (LMS) is an effective for the institutions to develop the learning material electronically, to offer the e-courses to the students, to test and evaluate the capabilities of the students and to generate the results and progress chart of the students. LMS has the worth of more than 3 billion dollars and it has hundreds of platforms that support all the aspects of learning at companies and universities also (Tena et al. 2016). Hall (2003) defined that "LMS is a software that automates the administration of training events. All Learning Management Systems manage the log-in of registered users, manage course catalogs, record data from learners, and provide reports to management." Basically, it combined the technology and disciplinary contents together to provide fast services to distance learning students. There are different types of online education systems used by universities across the globe such as: Moodle, ATutor, WebCT (Blackboard), Adobe Connect, AkademikLMS, Claroline, Sakai, Angel and others.

However, Paulsen (2002) identified WebCT (Blackboard) and Moodle are the two eminent web based education systems which are significantly used at the higher education institutions of Turkey and Northern Cyprus. The universities preferred these systems due to

technology integration into the education. But, unfortunately these systems have little focus on standard specifications by IMS Global Learning Consortium (IMS) and Sharable Content Object Reference Model (SCORM). Kaya (2012) explored that Moodle, WebCT and Adobe Connect are widely used learning management systems at the universities of Turkey and Northern Cyprus. Moodle (Modular Object-Oriented Dynamic Learning Environment) is basically open source software. It is design to support the effective learning activities. It has four Moodle named: videos, quiz, discussion forums and materials which directly work with windows, Linux, UNIX and Mac (Simanullang & Rajagukguk, 2020). While WebCT (Blackboard) is a commercial software. It is superior to WebCT due to cost effectiveness. However, Adobe Connect system is intensely used for web conferences at the universities of Turkey and Northern Cyprus. So, it can be said that these universities intensely used these technologies for distance education (Kaya, 2012). In recent times, Gewirtz (2021) stated that COVID-19 has created new urgency on academic institution about online learning. The author listed the most popular learning management system (LMS) which are Blackboard, Canvas, Moodle, Google Classroom and SAP Litmos LMS. The literature revealed that acceptance of leaning management systems (LMS) in the academic environment varies from country to country and institutions requirements to improve their teaching and learning systems (Zwain, 2019).

3. Student Management Systems (SMS)

It is essential online software to manage and control the students' personal and academic information which have core function to manage the information of student, teacher, course instructions, admissions, dues payment, examination and grade records (Paulsen, 2002). Pan (2004) defined the Student Management Systems (SMS) as "a general information system for maintaining and providing student information and it almost exists in all the schools, colleges,

universities and any other education institutions". There are different names of Student Management Systems (SMS) included: SMIS (Student Management Information Systems), SIS (Student Information Systems), SAIS (Student Academic Information Systems). SDW (Student Data Warehouse), OSIS (Online Student Information System) and SARIS (Student Academic Register Information System). These systems almost have the similar features to manage the students' record at educational institutions. Sangamesh, Samanekar and Pujar (2018) highlighted that Student Management Systems (SMS) is proficient and user friendly software as compared to manual work. It is centralized software and used for the assessment of students' learning and manage the students' academic and personal data immediately in a single click. The cloud services of Student Management Systems (SMS) allowed the students and faculty to access the desire information from remote places. Paulsen (2002) explored the Student Management Systems (SMS) software used in Scandinavian and Australian Universities. PeopleSoft (CQU, GU), Banner (CSU), and Student One (UTS) are most popular SMS software at Australia which developed by North America. However, Felles System by Norway and LADOK by Swedish are also popular. In short, the universities have also developed in house system instead of commercial software due to major budget constraints.

4. Accounting Systems (AS)

Accounting Systems (AS) of universities are not proper developed yet. However, these systems are integrated with LMS (Learning Management Systems) and SMS (Student Management Systems). Due to the COVID-19, the integration of different education systems of higher education institutions has been increased. So the institutions gradually focused on students' online enrollment, payment and credit account information. Paulsen (2002) highlighted that PeopleSoft, Student One and Banner are the software which are integrated with accounting

systems used in LMS systems named BlackBoard. However, Agresso accounting systems is also becoming dominant at Norway and Sweden.

Review of the literature revealed that there is a trend of technology utilization for education in developed countries. However, less developed countries are still at infancy stage to utilize such technological tools for the development of education systems. But need of the time, the COVID-19 pandemic and drastic change in technological tools compel organizations to think and implement online education systems for the benefits of the society i.e. students and organizations.

Online Education SWOT Analysis and discussions:

SWOT (Strength, Weakness, Opportunity, and Threat) analysis is used to investigate the strength, shortcomings, opportunities and threats to any organizations, associations and institutions. This technique is significantly used in business and industry but gradually, it has been utilized for the improvement of the education and self-awareness too. According to Wheelen and Hunger (1995) SWOT analysis is a broad instrument to examine the inner and outer situation of any institution in order to achieve the strategic administration circumstance (GretZky & Harrison, 2010). SWOT analysis is integrated with strategic planning and decision making at educational institute. The strategic planning process is considering the powerful parameter to help the educational institutions to develop strategic planning and find out their opportunities and threats within the educational environment (Shu-Hsiang & Ana, 2015). In this perspective, Gupta and Sharma (2020) conducted comprehensive research on SWOT analysis of online teaching method during the pandemic covid-19. The results stated that online teaching system has the strengths to attend the class anytime and anywhere. It also save the time, promote retention of learning and also reduce the cost of transportation. However, weakness are poor

internet connectivity, inability of teacher to keep eye on each and every student, lack of transparency to conduct online examination, partial assessment and inadequate feedback. Online learning provides them the opportunity to meet their teachers and class mates at one platform during lockdown who are far away for them. In the online learning, cybercrime is the biggest threat for universities. It is suggested that incorporate online learning with classroom teaching to overcome the weakness and threats to best utilize the strength and opportunities. Similarly, Alam (2020) described that the students have to adopt cognitive and metacognitive strategies to reach their learning goals in an online education system. Online education system provides them the opportunities to finish their courses timely and create health relationship with teachers to avert all kind of anxieties which faced during online learning process in COVID-19. In the same way, they have faced numerous challenges such as entirely different experience of learning to switch from traditional education system to online education system, breakdown of electricity and internet connectivity in rural area, poor computer literacy skills, technical interruption of technology such as Zoom limited time connectivity and difficult to interact every individual student.

The pandemic COVID-19 has forced the education sectors to adopt information technology tools for their survival by delivering online education and e-services by libraries. There is dearth of literature on online education systems and libraries e-services, their planning and also implementation in this technology era and the pandemic.

Methodology:

The proposed research study will be executed through Explanatory Sequential Mixed Method Research. In that particular design, there are two phases to conduct a study i.e. Phase one quantitative phase and phase two is qualitative phase. The strength of this research methodology

is confirmatory nature and validate the results of Phase one (Quantitative phase). In Phase one a semi-structured questionnaire will be prepared on the basis of literature and IT experts engaged in providing help to faculty and students during online classes. The final questionnaire will be reviewed from experts in the field of education and particularly experts engaged in the online education system. Also the questionnaire will be tested through pilot testing by selecting a sample from faculty.

Phase One i.e. quantitative phase data collection process i.e. distribution of data collection tool among respondents complete process is shown in Figure 1 (a self-explanatory flowchart describing each step and its execution). The study will cover the whole country Higher Educational Institutions (HEIs) faculty and administrative officers of the universities engaged in the delivery of online education program activities.

The proposed proposal may be executed in two phases to know the actual position of online education in Pakistani universities. In the first phase, the universities Vice Chancellors/Rectors will be contacted and instructed by Chairman Higher Education Commission (HEC), Islamabad. The Vice Chancellors/Rectors will further direct all Head of Departments (HoDs) including Administrative heads to fill the semi-structured questionnaire by all their faculty members including HoDs. However, in the case of administrative staff, only administrative heads will fill the semi-structured questionnaire. After completion of the semi-structured questionnaire filling process, The Vice Chancellors/Rectors may engage some personnel/faculty members for the collected data analysis, interpretation and summarizing the final report. The final report with the collected semi-structured questionnaires will be submitted to HEC, Islamabad. However, for smooth and quick processing; HEC Islamabad may engage HEC regional offices at the provincial level.

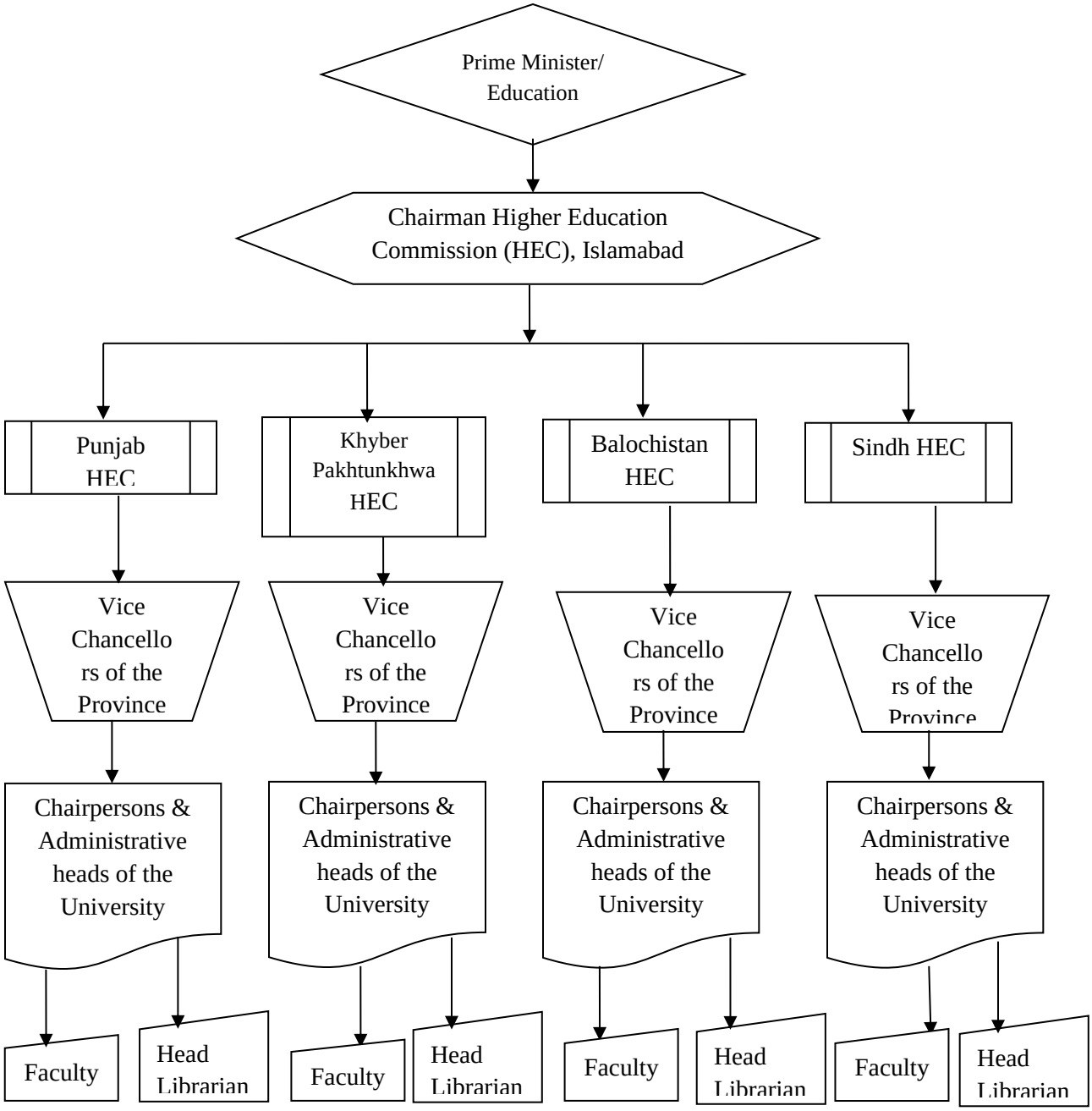

Figure 1: Flowchart of hierarchy from Top to bottom for the execution of the project.

The data will be collected in the sequence as shown in Figure 2. Also, the flowcharts (Figure 2) showed the steps that how the collected data will be analyzed, interpreted and reported at organizational stage. Also, the same reports with original questionnaires will be submitted to

HEC to combine the whole country data to see the real picture of the universities/ HEIs. Also, the HEC will identify the status of HEIs provincially and by the type of organizations (Public and Private). Such understanding of data will help the authorities in designing policies for online education, memorandum of understanding (MoUs) among universities may be negotiated for the benefits of HEIs, resource sharing facilities, and even share the online lectures of their faculty with other universities to promote online education by utilizing the existing resources.

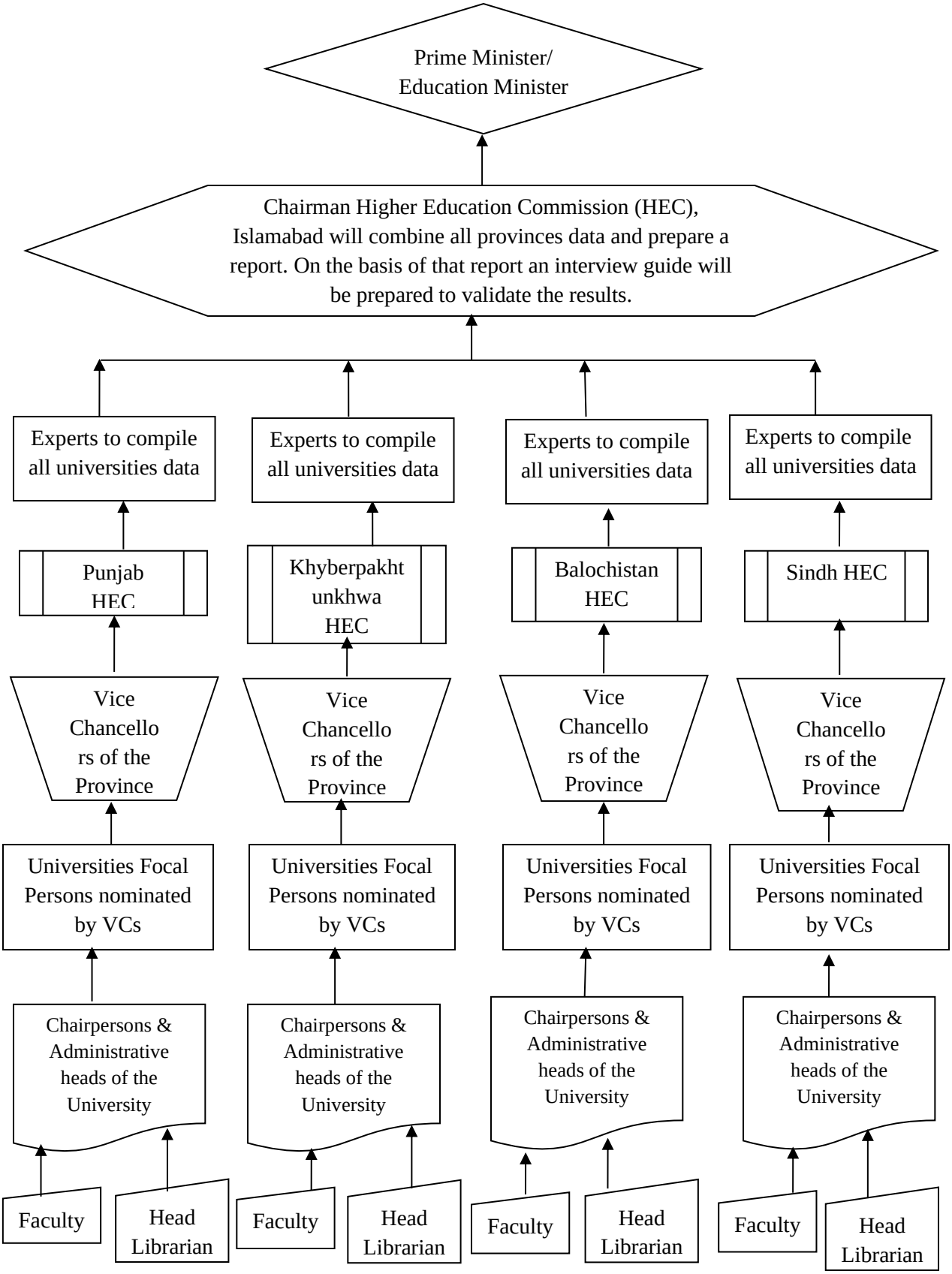

Figure 2: Data Collection Execution from bottom to top

In Phase Two, an interview guide will be prepared on the basis of phase one results. The interview guide will be further revived and tested to address the study objectives. Participants for the interviews will be the Vice Chancellors/Rectors of all educational institutions in Pakistan. However, the VCs/Rector may nominate his nominee on his/her behalf to participate in the focus group interviews to clarify the situation. However, during the interviews the principal investigator may select some participants among the VCs/Rectors for final round to understand the in-depth strengths, Weaknesses, Opportunities and Threats to online educational programs.

The second phase qualitative data (interviews) will be processed by the principal investigator and his team. Finally the data received from phase one and phase two will be combined to address the objectives of the study collectively.

Proposed modules of LMS

Six modules will be included in this proposed learning management system as shown in Figure 3. These modules may include students module, teachers module, examination module, general administration, online class management and Librarian module. All the modules will be integrated with each other. Students' module will provide information about classes' time table, results, general notification, and access to library material. Teachers' module will provide information about classroom management, time tables, attendance etc,. Examination module will provide information about results and other related information to students. Class management module will support faculty to manage their classes online and reshuffling of classes. However, Librarian module will facilitate librarians to provide library facilities to students and maintain students' library records like students circulation history, fine, membership and overdue library materials record for clearance purposes.

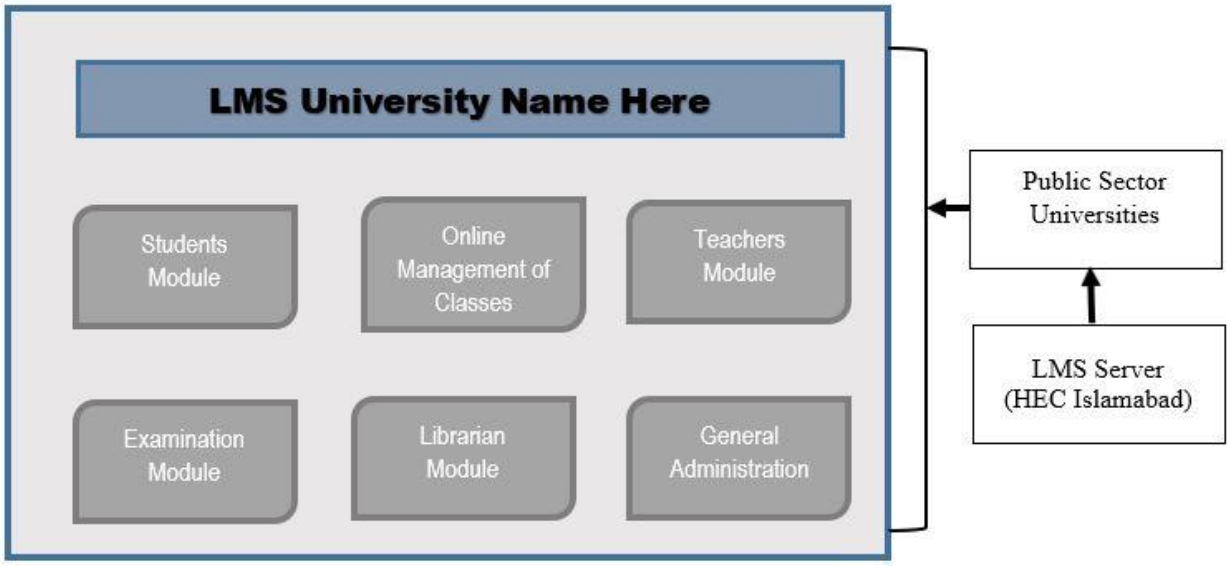

Figure 3: Main Interface and architecture of proposed LMS

Outcomes of the proposed study project:

The proposed study project will help in identifying the universities online educational programs and online libraries services strengths and opportunities for the effective utilization. However, it will mention the universities online education programs and online services of libraries weaknesses and threats that should be considered for improvements to improve online education programs and libraries online services in universities. It is important to note here that if the weaknesses and threats are known; so the organizations may utilize such situations effectively by planning with the experts of that particular areas. On the basis of the study findings, a policy for universities' online educational programs and libraries online services will be proposed to Higher Education Commission (HEC), Islamabad-Pakistan for HEIs smooth functioning during any accidental situations like COVID-19 pandemic in the country and the whole world also. The online education system and online services of libraries will be promoted by executing such projects. That helps community members to get register for getting online education by saving their time, finances, convenience in listening to lectures, easy

communication with educationists, international faculty members may be engaged easily, and professional enrolled as students may be developed without quitting their jobs. Also, the proposed study outcomes will help HEIs to generate finances through online educational programs and save HEIs resources like physical spaces, electricity, office management, classrooms management, security matters and other facilities required in the traditional education system like spaces reading rooms, physical books and other library materials. The findings of the study may be generalized internationally for the same nature (less developed) countries.

Key Personnel:

The Education minister; Chairman HEC Islamabad; Directors of HEC regional offices and the Vice Chancellors/Rectors of the universities/HEIs of Pakistan are the key personnel for the execution of the project. Furthermore, The Vice Chancellors/Rectors must engage two/three personnel/faculty members having expertise in the execution of such projects/data processing and report writing. Also, the Vice Chancellors/Rectors may provide the names and qualifications of the personnel who will be working on the project to the principal investigator. The principal investigator may call the university designated personnel for training and discussions for uniformity in working at the university level and finally at a national level.

Resources Availability:

All resources such as financial, literature, physical, technological, and human resources will be available for the project as it involved by HEC and universities directly having sufficient resources for the execution of such projects.

Impact:

The impact of the current project will identify the ways for the smooth and effective delivery of education in the country during lockdown (COVID-19). Also, in the future,

educational institutions may offer online degree programs permanently to save the time and money of students and to provide them development opportunities within work/during office hours. Also, universities may generate income and save their finances by engaging/enrolling more students in online education programs. Also, online services by libraries will be promoted instead of traditional library services. Even on a single click, libraries will provide online services to library users anytime through internet. In such cases the library users may become more active and satisfied from the services departments.

Budget:

On the approval of the proposed project, the principal investigator may propose a project monthly honorarium and after approval from the concerned authorities, the same approval will be communicated with Vice Chancellors/Rectors to nominate the three to five faculty or staff member for the project. However, nomination from universities may vary from university to university depending on the total strength of the university. The monthly honorarium of the project will be managed by the HEC, Islamabad. However, in case of non-availability of finances, the university Vice Chancellors/Rector may be directed to release the project honorarium on monthly basis to the university nominees for the project execution. The universities nominees will be engaged in the project for three months. However, the principal investigator and his team will be engaged throughout the project.

Time Duration of the Project:

The proposed duration of the project is at-least one year. However, the universities nominees may be engaged for three months (1-3) i.e. data collection, analysis, interpretation, discussions and conclusion.

The principal investigator and his team will be engaged for the whole year. However, the time segmentation is as the First three-month semi-structured questionnaire development on the basis of literature. The developed tool will be prepared online in Google form to collect data online. Second slot i.e. next three months (4-6) a communication with universities nominees, ground working, training if any, etc will be schedule. Third slot i.e. next three months (7-9), the collected data of universities on the basis of submitted reports will be further processed from an organizational perspective. In this duration, the collected data analysis, interpretation and discussions will be prepared. In the last three months (10-12), the final re]port will be prepared. After completion of first phase, an interview guide will be prepared on the basis of phase first findings. The interview guide will be shared with experts to know their expert opinion in a focus group interviews. The focus group results will validate the study findings. At the end the phase one and phase two finding will be merged to summarizes final findings of the study. The final report will be submitted to HEC, Islamabad for further planning and designing policy for HEIs'.

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