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## **Installation of Koha in Pakistani Libraries: A survey of librarians**

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### **Abstract**

This study explored the intricate processes of installation of Koha, the world's most widely used Integrated Library System (ILS), within the specific socio-technical context of Pakistan. KOHA is not merely a technical "one-click" event but a sophisticated administrative and technological undertaking. This study used a quantitative research design, gathering numerical data on installation of KOHA in libraries through a structured questionnaire. It is descriptive in nature to understand professional practices and the experiences of the institutions about installation of KOHA. The results showed that there are two ways to install Koha. Compared to installing Koha directly from the source (39%), a larger percentage (61%) choose the server installation technique. The vast majority of responders (81%) installed Koha using the Windows operating system. A smaller percentage of people utilized other operating systems. Installation is deemed easy or very easy by the majority of respondents (70%). The complexity of the installation process is rated as difficult or extremely difficult by slightly more than one-fourth (28%). Librarians were more involved in installation and maintenance than in self-hosting, as seen by the higher mean values for self-maintenance and self-installation. Compared to full implementation, a greater percentage of Koha is partially implemented. Respondents were familiar with Koha commands and thought of themselves as Koha experts. This

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research paper makes strategic suggestions to move beyond the current nascent stage of installation, it is imperative that academic institutions and government bodies move away from viewing Open Source Software (OSS) as a purely "zero-cost" solution and instead treat it as a critical piece of national information infrastructure. This would ensure that new graduates enter the workforce with the practical skills required to troubleshoot Zebra indexing issues or design a bilingual English-Urdu user interface without external, high-cost consultancy.

**Keywords:** KOHA, Integrated Library System, Quantitative Research, Metadata Standards, Librarian Roles, Pakistan, OPAC, OSS, ILS

### **Background of the study**

In the digital era, library automation and integrated library systems (ILS) play a vital role in increasing access to information resources. KOHA, open source software is being used to automate library resources in developing countries. KOHA can increase the extensive implementation in libraries worldwide due to its elasticity, cost-effectiveness, and healthy features. The use of KOHA expanded to public, academic, and special libraries as it can improve functionality and efficiency. However, the process of installing KOHA can be difficult and needs technical capability. Different factors such obsolete software, desire for to improved capabilities, adherence to new standards, or financial concerns, may be the motivating force for Installation of KOHA. Normally the libraries struggle with the Installation of KOHA systems.

Installation of KOHA in libraries, offer smooth resource access, cataloguing, circulation, and user services which are crucial for effective library administration. A fundamental procedure affecting operational effectiveness and library administration is the installation of KOHA. However librarians intend to install KOHA may face difficulties. System incompatibility, staff training issues, and service interruptions are just a few of the major obstacles that may haunt the installation of KOHA. Inefficient staff, and lack of technical expertise may create difficulties while installation of KOHA software in a libraries.

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Therefore, examining the factors affecting the installation of KOHA in libraries, identifying typical problems, and offering suggestions for best practices can solve these problems. This study aims to bridge the knowledge gap and assist library professionals to install the KOHA making well-informed decisions, guaranteeing little disruption and enhanced service delivery. Research on the particular issues libraries experience during installation and the best strategies for guaranteeing a successful installation of KOHA is required. The current study is designed to examine the experiences of librarians about installation of KOHA by surveying librarians. This study also looks at how the installation of KOHA affects library staff in order to guarantee less interruptions and better service.

This study is important for improving the effectiveness of libraries (Hernon & Altman, 2010). The findings will inform librarians about installation related problems, including how to install, system compatibility, staff training, and offers solutions to address them. The libraries preparing to installation of KOHA will benefit significantly from this study for the decision-making as it investigates the factors that can effect installation of KOHA in libraries. Insights for upcoming library automation research and development are provided by to study's findings, which contribute to the body of knowledge in library and information science (Cassell & Hiremath, 2023).

### **Objectives of Study**

This study aims to:

1. To understand that what is the process of KOHA installation.
2. To identify that what types of challenges faced during installation of KOHA.
3. To assess that what is the impact of KOHA installation in library operations and staff satisfaction.
4. To explore the best practices for a smooth Koha installation.

### **Literature review**

#### **Methods and Procedure of Koha Installation**

According to Jadon (2022), Windows and Linux Operating systems may support the installation of KOHA. The library installing KOHA has to acquire the hardware and

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additional accessories for the successful installation of KOHA. The required hardware included a computer, stabilizers, uninterruptible power supply (UPS). The hardware specification were the core i3 7 Gen, 4GB RAM, a 500GB HDD, Linux operating system.

According to Ibrahim, (2022) Oracle VM VirtualBox 6.1 was installed on Windows 10 Pro, version 22H2, which provided an installation environment for Xubuntu Linux OS. The Xubuntu was installed, which enabled the installation of Koha ILS. Oracle VM VirtualBox 6.1 is a free, cross-platform hypervisor that allows users to run multiple guest operating systems simultaneously. It provides a simple user interface to manage VMs, and supports 64-bit and 32-bit OSes, USB connectivity, shared folders, 3D/2D graphics acceleration, snapshots, and cloning. Xubuntu is a Linux distribution that is known for its lightweight nature and energy-efficient characteristics. It is built upon the Xubuntu operating system and utilizes the Xfce desktop environment. The operating system offers a rapid, highly adaptable, and personalized desktop interface that is particularly suitable for older or less capable devices, while still granting users access to Xubuntu's extensive collection of software applications.

### **Challenges in Koha installation**

Bwalya (2021) noted that not all libraries have employees with technical competencies to implement FOSLMS including KOHA. There are less Linux skills and database knowledge among many librarians in Zambia as Library Science curricula do not have any modules concerned with Linux. Consequently, the higher education institutions have been unable to update their KOHA installations in a long time. They are still operating with the outdated versions that were installed as early as 2011. Moreover, librarians have not acquired how to save KOHA therefore some of the libraries in the higher institutions have lost their vital records when the system collapses.

According to Bwalya (2021), KOHA is not simple to install and set up. It takes much time to install it. Moreover, it requires Linux, SQL, HTML and CSS knowledge to install KOHA.

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Sterbenz (2018), examined the use of KOHA at the Kresge Library Services at the University of Michigan Manager of Electronic Collections Administration. KOHA is self-hosted, self-installed, self-maintained and (as far as its exposure to the outside world is involved) allows users to search our electronic holdings (the majority of which are supplied by aggregators). At the staff side, it is also applicable to follow up on collection spending by use of some select Acquisitions elements within an individual instance. John Sterbenz, Manager of Electronic Collections Administration at the University of Michigan's Kresge Library Services" says that a person who has acquired a self-made understanding of nix systems, obviously, there can be some more effective methods to reach what these instructions are intended to achieve. This is the set of commands that has been functioning with only slight adjustments after it was initially put together in January 2016 and last revised/reviewed in July 2019. I would be negligent to leave unmentioned a (currently outdated) guide authored by Josh Hertel that I accidentally stumbled over in late 2015 and that helped me achieve success after the several unsuccessful experiences that happened after several months of failed attempts. Research by Adoma and Shana in Uganda on 35 academic libraries that had implemented Koha showed that most (77) of the respondents mentioned the issue of unavailability of technical support when implementing Koha as well as after the implementation of Koha.

It is also true that, despite the satisfaction that users had with the use of KOHA ILS, there are challenges that are linked to the use of the system. As an example, the results provided by (Amando et al, 2018) indicated that the challenges identified in their research were internet connectivity, technical knowledge, non-use of all modules, installation challenges of KOHA among others. Omopupa et al. (2019) have found that some of the modules of their library are not implemented due to the lack of appropriate training.

Tella et al, (2017) also established that power supply and lack of in-house expertise are the greatest hurdles to the adoption of KOHA ILS by the four identified libraries in Nigeria.

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Makori and Osebe (2016) aimed to identify the benefits and limitations of adopting KOHA in an information management system in Kenya. They received data about the views of the respondents and their experiences with KOHA and analyzed how they felt about it personally, as well as the information on the field usage and potential remedies. Absence of shared vision, absence of sufficient resources, absence of knowledge, skills and competency, absence of leadership, management problems, institutional and physical problems and resistance towards change are some of the significant problems that were identified in the study.

Makori and Osebe (2016) tested the effects that KOHA has had on the information management bodies in Kenya. The impact of their study was that KOHA was in a position to offer these organizations with more long term financial solutions. KOHA positively influenced their organizations in the aspect of the provision of the correct information at the appropriate time. In the library of the Northern Marianas College, (Todd, 2017) described that there was no previous training, limited IT service as well as a shortage of competent workers and no company support among the challenges that he faced during installation of KOHA as per him. By the time the project was executed in two months, it was due to the lack of experienced personnel to carry out the project.

It was also noted by Kumar and Jasimudeen that most libraries which lacked the in-country knowledge to install the open-source software, like KOHA, needed to contract out technical services, including installation, This issue was aggravated by the fact that the curricula of Library and Information Science Schools in most countries failed to provide sufficient ICT courses to enable librarians to deliver services in the digital age. Thus, most libraries were contracting third party firms to host their KOHA databases on a pay-per basis. In case of a KOHA consulting company in the United States of America (USA), a library with 15,000 items would be billed USD 10,700 to install KOHA and USD 2500 annually to support the installation..

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In the implementation of the KOHA ILS at the Babcock University Library in Nigeria, (Omeluzor et al, 2012) reported the challenges they faced as a result of absence of supervision, absence of management motivation as well as irregularity of power.

According to Shafi-Ullah and Qutab (2012), the libraries of the legislative assembly in Pakistan were the case study under consideration, many of the problems were caused by the absence of funding, training of the staff, and the lack of interest in adopting new technologies, and also the unwillingness of the librarians to change.

Not only is the history of development of Online Public Access Catalog (OPAC) in line with trends in changes in technology, information behavior, and expectations of its users, it is also directly connected to it (Liu, 2008).

### **Research Design and Method**

Quantitative research design is used for the current study. The research is based on a descriptive and cross-sectional survey method that would help to get up-to-date and detailed information regarding a certain phenomenon in the predetermined population at the definite period of time. Quantitative approach is selected because it will allow obtaining structured, standardized and statistically interpretable data, without which it is impossible to comprehend the complex factors of installation of Koha. According to Bryman, (2016) the quantitative surveys are effective in LIS as these can be used to generalize findings and identify patterns among a defined population. The primary research instrument contains demographic and case-related questions. The questionnaire was created on the basis of the past empirical studies and other literature reviews, closed-ended questions and 5-point Likert scale sentences were used for data collection and the simplicity of quantitative analysis. The questionnaire is used to capture information on a number of areas related to installation:

1. The current status of installation of Koha,
2. Adoption and use of Koha and installation,
3. Use of professional skills to install Koha,

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### **Population and sampling**

The target population of the study were library professionals, systems librarians, and IT staff taking part in installation of Koha in both the public and the privately-owned universities and research centres in Pakistan. This research used the non-probability purposive method of sampling where only the relevant and experienced people that have worked in the fields of libraries which make installation of Koha were selected given a sample. The very idea behind this method is to have quality and applicable information by the involvement of only those working directly with the installation of Koha work. The approximate target sample size was 125 to 150 people among which the minimal number of complete valid responses is expected to be gathered and analyzed. The planned sample size is justified given the focus and specificity of the research topic.

### **Pilot Study**

A pilot study was done to validate the questionnaire before large-scale distribution. Ten library professionals from diverse institutions will be invited to participate in the pilot, providing critical feedback on the clarity, phrasing, relevance, and time required to complete the questionnaire. Based on their input, necessary modifications will be made to improve the instrument's language clarity and alignment with local library practices. The reliability of the scale items will be assessed using Cronbach's Alpha, which is expected to yield a coefficient above 0.7, which implies that it is an acceptable level of internal consistency, as suggested by Tavakol & Dennick, (2011).

### **Data Collection and analysis**

After finalizing the questionnaire, the researcher prepared the questionnaire on Google Forms. The researcher distributed the questionnaire link through:

1. Professional mailing lists (e.g., Pakistan Library Automation Group),
2. WhatsApp groups of academic librarians,
3. Direct emails to library heads and professionals.

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To enhance response rates, follow-up reminders were sent during the data collection period. Ethical approval has already been obtained from the Department of Library & Information Management, The Superior University, Lahore.

Once the data collection phase is completed, each questionnaire were assigned a unique number by the researcher. The data obtained was then exported to the Statistical Package of the Social Sciences (SPSS) for analysis. All mistakes that occur in the process of data entry were corrected. The data was analyzed by using descriptive statistics such as frequency and percentage counts, mean, and standard deviation.

## **Results**

### **Demographic detail of respondents**

Dominant majority of respondents were male. Out of 155 respondents, 109 (70%) were male. One third (30%) of the respondents are female.

With respect to qualification of respondent, Majority of respondents were MPhil graduates (63%) followed by BS/MA (30%) and PhD (06.45%)

With respect to experience, the most experienced respondents with 10-20 years of experience have higher percentage (42%) as compared to other categories of experience. One fourth of the respondents have 6-10 years' experience.

There is small difference in the respondent's sector of organization. Out of 155 respondents, 83 (53%) were working in government organizations and 46% were working in private sector institutions.

Dominant majority of respondents were associated with universities. Out of 155 respondents, 123 (79%) were working in universities. One fifth (21%) of the respondents were working in school, college, public, national or research libraries. The results about the types of institutions are given in Table 1.

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**Table 1: demographic detail of respondents**

<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	109	70.30
Female	46	29.70
<b>Education</b>	<b>Frequency</b>	<b>Percentage</b>
BS/MA	47	30.32
MPhil	98	63.22
PhD	10	06.45
<b>Experience in years</b>	<b>Frequency</b>	<b>Percentage</b>
1-5 years	26	16.77
6-10 years	40	25.81
11-15 years	24	15.48
10-20 years	65	41.94
<b>Sector</b>	<b>Frequency</b>	<b>Percentage</b>
Government sector	72	46.50
Private sector	83	53.50
<b>Types of institutions</b>	<b>Frequency</b>	<b>Percentage</b>
Universities	123	79.40
Other libraries (Public, college, school)	32	20.60
Total	155	100%

### **Method used for installation of Koha**

Koha is installed by using two methods. Respondents were asked to tell the method they used for installation of Koha. Majority of the respondents used server installation method (61%) and 39% installed Koha from source. The results about installation method are given in table 2.

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**Table 2: Methods used for installation of Koha**

Types of installation	Frequency	Percentage
Server Installation	94	60.65
Installation from source	61	39.35
Total	155	100

### Operating systems used for Koha Installation

Dominant majority of respondents (81%) used Window operating system for installation of Koha. Debian/Ubuntu/Linux was used by slightly more than one tenth (12%) of respondents. Mac OS is also used by 6% respondents.

**Table 3: Operating systems used for installation**

Types of Operating systems	Frequency	Percentage
Window	126	81.29
Debian/UBUNTO?LINUX	19	12.26
MAC OS	09	05.81
Red HAT enterprise linux	01	0.64
Total	155	100

### Rating complexity of installation process

Respondents were asked to rate the complexity of Koha installation. Majority of respondents (70%) consider installation as easy or very easy. Slightly more than one fourth (28%) rate the complexity of installation process as difficult or very difficult.

**Table 4: Complexity of installation process for Koha**

Rating of complexity	Frequency	Percentage
Very Easy	15	09.68
Easy	96	61.93
Difficult	40	25.80

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Very difficulty	04	02.58
Total	155	100

### **Koha hosting, installation and maintenance: Role of librarians**

Respondents were asked about their role in installation, maintenance and hosting of Koha. The mean value near four shows the level of agreement in doing these three jobs by librarians. The higher mean values for Self-maintenance and self-installation than self-hosted show that librarians were more engaged in installation and maintenance as compared to self-hosting. Data about role of librarians in Koha installation, maintenance and hosting is presented in table 5. Values of standard deviation less than 1 show higher level of similarity of opinion of respondents.

**Table 5: Koha installation, maintenance and hosting**

Role of librarians	Mean	SD
Koha is self-maintained	04.03	.833
Koha is self-installed	03.99	.747
Koha is self-hosted	03.70	.934

### **Koha implementation: Full or partial**

Respondents were asked about the implementation of Koha in libraries by them. Mean value is higher for partial implementation as compared to full implementation. Values of standard deviation for partial implementation show similarity of opinion of respondents whereas there is more difference of opinion for fully implementation of Koha.

**Table 6: Koha implementation**

Koha implementation	Mean	SD
My library has partially implemented Koha.	04.17	0.676

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My library has fully implemented Koha. 03.77 1.102

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### **Level of Koha expertise**

Respondents were asked about their level of expertise and level of familiarity with commands. Mean values slightly less than 4 show that respondents consider themselves expert in Koha and are familiar with commands of Koha. Values of standard deviation less than 1 show higher level of similarity of opinion of respondents.

**Table 7: Koha expertise**

Nature of expertise	Mean	SD
Fully expert in Koha installation	03.74	.471
Familiar with installation commands of Koha	03.69	.531

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### **Training for ILS and metadata standards**

Respondents were asked about the training of staff about library systems and metadata standards. Three fourth of respondents agreed or strongly agreed with the provision of training for ILS and metadata to library staff. One fourth remained neutral and did not give their opinion about the provision of training.

**Table 8: Training for ILS and metadata standards**

Training frequency	Frequency	Percentage
Strongly agree	49	31.60
Agree	67	43.20
Neutral	38	24.50
Disagree	01	0.60
Total	155	100

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### **Findings and discussions**

The findings indicated that Koha is installed by using two methods. Server installation method is used with higher proportion (61%) as compared installed Koha from source (39%). Dominant majority of respondents (81%) used Window operating system for

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installation of Koha. Other operating systems were used on lower percentage. Majority of respondents (70%) consider installation as easy or very easy. Slightly more than one fourth (28%) rate the complexity of installation process as difficult or very difficult. The higher mean values for Self-maintenance and self-installation than self-hosted show that librarians were more engaged in installation and maintenance as compared to self-hosting. Koha is partially implemented in higher percentage as compared to full implementation. Respondents consider themselves expert in Koha and were familiar with commands of Koha. Respondents agreed or strongly agreed that training for ILS and metadata may be provided to library staff.

The installation process of Koha has some very broad implications. These range from economic relief to the need for a paradigm shift in the "traditional" librarian's skill set. Economic Liberation from Proprietary "Vendor Lock-in" Pakistani libraries have historically been plagued by the high costs for foreign proprietary software (like Virtua or Sierra) as well as high annual maintenance fees that drain limited budgets. Adopting Koha will enable institutions to allocate more money away from "software rent" and into digital collection building and enhancing physical library infrastructure. The migration to Koha involves uprooting the Windows base versions to Linux (Ubuntu/Debian). There is a dire need for "Techno-Librarians." Traditional library science curriculum in Pakistan needs to change and CLI basics, SQL and CSS should be taught. Librarians that do not adapt may find themselves flying in the vampire wings during the digital transformation.

## **Conclusion**

Based on the results, the Koha installation in Pakistan is in the beginning stage and consists of a patchwork where most academic and public organizations have partially implemented. While the worldwide movement towards open-source library management systems has an incredible potential, a look at the Pakistani scenario shows the serious gap between availability of the software and its sophisticated use. To be sure, success in this digital transition is not only a technical milestone but is subject to a complex dynamic of

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technical, organizational, and human resource factors. On the technical front, the need for Linux-based management of the servers is bound to clash with the existing Windows-centric expertise in the many a local IT department. Additionally, the human resource aspect remains a necessary bottleneck, as often the training of staff will be ad hoc or gone entirely as a result, leaving these staff epileptic when it comes to managing the complex "System Preferences" that define Koha's functionality. The sustainability of any Koha installation in the by country is directly linked to the depth of institutional support, articulacy of policy frameworks and visibility/visibility of senior leadership. Without administrative mandates recognizing the "Systems Librarian" as a specialized role the process of customizing often stalls after the initial web-based installation. Leadership must also stop seeing Koha as a "free" tool and instead it must be seen as a strategic asset to which a dedicated financial investment in providing cloud hosting, security protocols, and hardware maintenance should be made. Awareness programs are as much needed to get users away from physical stack browsing to complex digital discovery.

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