Mobile Library Application in Indonesia's Digital Libraries

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A B S T R A K

Peningkatan penggunaan perangkat mobile di abad 21, ditambah dengan adanya pandemi COVID-19, terus mengubah berbagai sektor, termasuk perpustakaan. Perpustakaan adalah tempat untuk mencari informasi, baik secara langsung maupun online. Idealnya, perpustakaan harus berkembang dan meningkat setiap tahun untuk memastikan penyediaan layanan yang optimal kepada penggunanya. Perkembangan mobile application merupakan tren yang merevolusi cara konsumen mengakses informasi di berbagai sektor, termasuk sektor perpustakaan. Penelitian ini bertujuan untuk menganalisis perkembangan mobile library applications (m-library apps) pada perpustakaan digital di Indonesia dengan menggunakan metodologi deskriptif kualitatif. Setiap keberadaan aplikasi m-library diverifikasi menggunakan tautan terlampir atau fitur pencarian di Google Play Store. Hasilnya dideskripsikan secara deskriptif dengan fokus pada analisis aplikasi yang digunakan oleh m-libraries. Hasil penelitian ini menunjukkan bahwa perpustakaan digital Indonesia saat ini menunjukkan kemajuan, ditandai dengan perpustakaan di Indonesia yang memiliki mulai menggunakan aplikasi m-library di perpustakaan digital. Aplikasi yang paling banyak digunakan oleh perpustakaan digital di Indonesia menggunakan vendor pihak ketiga untuk mengembangkan aplikasi perpustakaan digital mereka, seperti Kubuku Resources, PT Enam Kubuku Indonesia, Gramedia Asri Media, dan Bina Pustaka. Hasil penelitian ini juga menyoroti kebutuhan untuk perbaikan berkelanjutan dalam aplikasi m-library, dalam hal penambahan fitur internal (misalnya, preservasi dan keamanan) dan fitur eksternal (misalnya, pelatihan pengguna dan faktor promosi.

A B S T R A C T

Increasing mobile device usage in the 21st century, coupled with the COVID-19 pandemic, continue to change various sectors, including libraries. A library is a place to find information, both in-person and online. Ideally, a library should develop and improve each year to ensure optimal service provision to its users. The development of mobile phone applications is a trend that has revolutionized how consumers access information in a variety of sectors, including libraries. This study aims to analyse the development of mobile library applications (m-library apps) in digital libraries in Indonesia, using a descriptive and qualitative methodology. Each m-library application's existence was verified using the attached link or the search feature on the Google Play Store. The results are described descriptively with a focus on the analysis of applications used by m-libraries. The results indicate that Indonesia's digital libraries are currently showing progress, marked by libraries in Indonesia that have started using m-library applications in their digital libraries. The most widely used applications by digital libraries in Indonesia typically used third party vendors to develop their applications, such as Kubuku Resources, PT, Enam Kubuku Indonesia, Gramedia Asri Media and Bina Pustaka. Our results also highlight a need for continuous improvement in m-library applications, in terms of adding both internal (e.g., preservation and security) and external (e.g., user training and promotional factors) features.

1. INTRODUCTION

Increasing mobile device usage in the 21st century, coupled with the COVID-19 pandemic, continue to change various sectors, including libraries. A library is a place to find information, both in-person and online. Ideally, a library should develop and improve each year to ensure optimal service provision to its users. Communication technology plays an important role in improving library service provision because of the demand for quick and precise information exchange that allows users to connect without being limited by distance, space and time (Aswinna & Rahmi, 2021; Patriawati & Hanum, 2021; Puspitadewi, 2020). An increasingly common library technology is the mobile library. A mobile library (m-library) is a library-based mobile application that can be accessed via smartphones or tablets with Android and iOS-based devices.

After increasing from 2011-2017, the number of mobile phone users in Indonesia reached 355.62 million users in 2020 (Nurhayati-Wolff, 2021). This rapid growth reflects the high consumer demand for cellular communication devices to access information and fulfil other needs. Other than laptops and tablets, smartphones

are considered the flagship mobile device based on their common use worldwide. In addition to sending and receiving calls and messages (SMS), smartphones can be used for various online activities, ranging from paying for goods and services to reading electronic books. A smartphone can be used as a learning tool, allowing users to learn new things from online content, and has also become a "lifestyle" icon for certain users (Daeng et al., 2017; Fitri et al., 2021; Yuniati & Ratmanto, 2017). Many libraries have followed the trends in increasing smartphone use by developing and improving technology to make library services widely accessible to users. The increased development of online content by libraries allows users to access content remotely without needing to visit a physical library (Fatmawati, 2012; Irfani & Sholeh, 2021; Nashihuddin, 2021).

Based on previous research, the development of digital library services should be the goal of all libraries (Fatmawati, 2012). Librarians must understand technology ranging from developing mobile applications to predicting the impact of mobile technology on library services. Similar research regarding m-library applications, which showed that implementing the UMS Library application allowed the net generation to access library services using Android smartphones (Habib & Prasetyawan, 2016). Similarly, another study found that the features and appearance of m-library applications made it easy for users to access library services (Hariyani, 2019). By searching for the information to present in the m-library, a librarian's understanding of library material may become completer and more flexible. However, the ability of all users and librarians to navigate m-library applications remains a concern. Based on the explanation of previous studies, an analysis of the development of the m-library application in Indonesia until 2021 has not been carried out. Therefore, this research aims to analyse the development of m-library applications in Indonesia by searching and analysing m-library applications in Indonesia, including those issued from the libraries of universities, secondary schools, elementary schools, and other agencies. This research will be helpful for the development of digital libraries in Indonesia.

2. METHOD

This study utilized qualitative research, which refers to the analysis of non-mathematical, descriptive data collected from as observations and documents (Arifin, 2012; Samsu, 2017). The search of the keywords "digital libraries" and "e-libraries" using the Android Google Play Store found 258 m-libraries, consisting of college, secondary school, elementary school, and other institutions, using mobile-based applications. For each m-library, the name of the application and any third parties (who participated as vendors in the development or purchase of the application) were identified. Each m-library application's existence was verified using the attached link or the search feature on the Google Play Store. The results are described descriptively with a focus on the analysis of applications used by m-libraries. Data collection and analysis procedures in this study is presented in Figure 1.
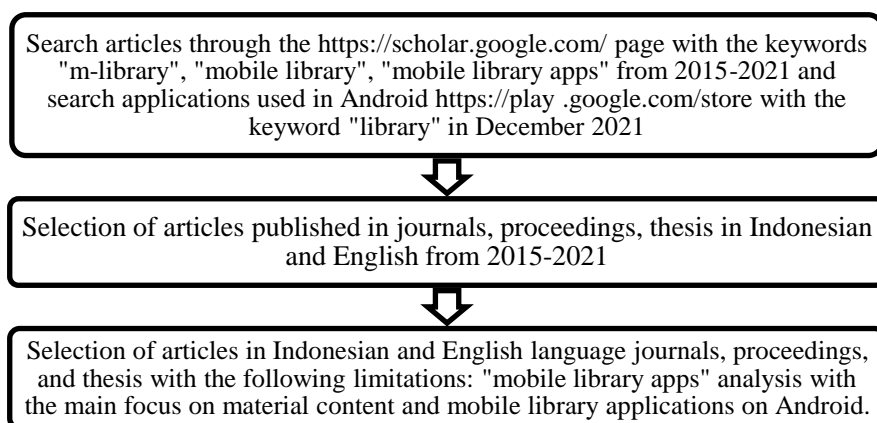

Figure 1. Data collection and analysis procedures.

3. RESULT AND DISCUSSION

Result

Mobile technology can be utilized anywhere at any time. Surachman (2014) states that there are at least three types of mobile technologies for building an m-library: 1) a standard mobile phone platform, which utilizes SMS or phone calls for transactions and for users to provide information (e.g., M-references, SMS References,

and Cal References); 2) a mobile web platform, allowing users to access a library's information services in the form of a website; and 3) a mobile application platform, used by installing or setting up a particular m-library application on Android via the Google Play Store or iOS via the App Store. Several institutions develop their own m-library application or collaborate with a third party to develop their m-library application. The services provided by m-library applications are OPAC, e-books, digital resource retrieval, digital resource readers, announcements, personal libraries (e.g., book borrowing and book renewal), resource sharing and resource subscriptions (Wei et al., 2015). An m-library application is also defined by accessing digital libraries through mobile phones and wireless networks without restrictions on time and place (Zha et al., 2016). Aside from keeping with technological developments and a digital era of obtaining information, the purpose an m-library is to make it easier for users to access and check out desired books and save time obtaining library information.
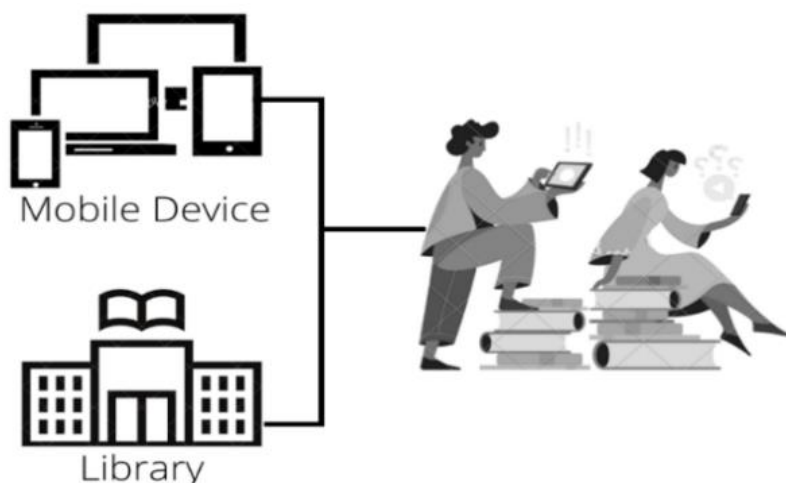

Figure 2. Illustration of Indonesian m-libraries

The results of the content of material targeted in the development of m-library applications are presented in Table 1. The design of m-library applications still requires careful, detailed planning, especially related to updates, bugs, security and user privacy. The addition of features that follow current technological developments is also necessary to upgrade existing applications. An m-library application must be accompanied by users who can optimally and adequately utilize the application so that the application will continue to develop according to the needs and goals of users. In Indonesia, m-libraries typically rely on third party vendors to build their applications.

Table 1. Target material in Indonesian mobile library application development

No	Material	Authors
1	Prototype Mobile Library Application	(Alturki & Gay, 2019; Nugraha, 2019; Rafique et al., 2020; Yulianah et al., 2019)
2	Android Platform	(Kristanda et al., 2018)
3	Go Library (Go-Lib)	(Ridlo, 2019)
4	Periodic Preservation (Updates, Bugs, Errors, Search and Force Quit)	(Aisyiyah, 2019; Yasumatsu et al., 2019)
5	User Interface (application quality)	(Damayanti et al., 2020)
6	Security, Reliability, Availability, and Cost	(Mishra et al., 2017)
7	Application popularity, user ratings, privacy and malware	(H. Wang et al., 2019)
8	Mobile Library Promotion	(Hu & Zhang, 2016; Nurhikmah & Dewi, 2017)
9	Mobile Library User Behavior	(Liu et al., 2020; Ming et al., 2021; X. Wang et al., 2018)
10	Training Users	(Ocran et al., 2020)
11	WeChat Mobile Library	(Wei & Yang, 2017)

The results of m-library applications in digital libraries in Indonesia are presented in Table 2. The most widely used m-library applications in Indonesia relied on third-party vendors for the creation of their application. The highest-ranking in 2021 on the Play Store on Android was PT. Enam Kubuku Indonesia, reaching 143

customers from several libraries of universities, secondary schools, and elementary schools. The general ranking was Bina Pustaka (35 customers), Gramedia Asri Media which reached 24 customers, PT Woolu Aksara Maya (8 customers), Mega Tjandra (4 customers), and Odilo (3 customers). Furthermore, several vendors with one customer each identified, such as 1) OverDrive, Inc., 2) Penerbit Erlangga, 3) Ganeca Digital Cerdas, 4) National Digital Library of India, 5) Nestlé, 6) Let's Read!, 7) Digital Data Systems, 8) LoveWorld New Media, 9) United Nations, 10) Tiga Serangkai Pustaka Mandiri, 11) Universiti Teknologi Mara, 12) Perpustakaan Bank Indonesia, 13) SmartGov, 14) Digital Library Unimed, 15) SETJEN DPR RI, 16) Talha Kerpicci, 17) IRTS - Markazi Anjuman Khuddam ul Quran, 18) Apps Superhero, 19) IJABI, 20) Digibook Technologies Developers, 21) Pakistan Agriculture Research, 22) Xentral Methods Sdn. Bhd., 23) Department of Higher Education, 24) Perpustakaan Nasional, 25) Engineering Solution For Nepal, 26) TarunKant, 27) KVR Cloud Technologies, 28) SFL-Technology, and 29) desideveloper2257. Overall, as many as 35 vendors developing m-library applications were identified. However, a weakness of our review is that we have no way to ensure that the 35 vendors are all third parties or whether there were standalone applications built among them. This is a potential area for further research.

Table 2. Indonesia's m-library applications on the Android Play Store

No	Vendors	Apps (Android Version)
1	PT. Enam Kubuku Indonesia	Digital Library University of Lampung; Umrah Digital Library; Prakasita Digital Library; UIA Digital Library; Matura Digital Library; Smapa Digital Library; Man Jadda Wa Jada Digital Library Smanda; E-Library UM Jember; e-library STIMUGO; e-Library STIKES Telogorejo; UMC Digital Library; e-Library ITB Ahmad Dahlan Jkt; Eskasata E-Library; Walisongo E-LIBRARY; E-Library Universitas Galuh; e-Library IAIN Bengkulu; Digital Library SMPN 4 Kuripan; Digital Library SMAN I STM Hilir; Andalusia Library - UPI YPTK; E-Library Eka Pustaka SMP 1 Tegal; E-Library SMP LHIBS; e-Library SMP Negeri 3 Gamping; E-Library Universitas Muhammadiyah Palembang; PusDiLa (Perpustakaan Digital Polinela); e-library SMPN 28 Bandar Lapung; Digital Library SD Plus Rahmat Kediri; E-Library SMP Negeri 02 Batu; e-Library Stikes Mitra Adiguna; Perpustakaan Digital Universitas Pamulang; Perpustakaan Digital Stikes Notokusumo Yogyakarta; e-Library SMA NW Narmada; Perpustakaan Digital IPB University; Perpustakaan Digital UMSU; Digital Library WBI; UMMI Digital Library; Digital Library Universitas Palangka Raya; IDPMI Digital Library; Thamrin Digital Library; Adipadma Digital Library; Digital Library IIM; Digital Library Binhus; Matsaneti Digital Library; Digital Library UHN; D3TI Digital Library; UKDC Digital Library; E-Library Rajawali; D4TI Digital Library; ePusda Natuna (Natuna Digital Library); Perpustakaan Digital Mayoga (Mayoga E-Library); D3TK Digital Library; S1SI Digital Library; STEI - Digital Library; FHS UMK Digital Library; e-Library FIK UMPalangkaraya; Ngabar Digital Library; Engineering Management Digital Library; Digital Library Ubhara; Cokroaminoto Digital Library; Digital Library UWHS; UKWK Digital Library; Andalusia Library; PPHM Digital Library; Digital Library Espero; Spidi E-Library; Digital Library Lintas Media; BoSa JHS Digital Library; Digital Library Manajemen Pendidikan; e-library Perpusbw2; Digital Library UDB; E-Library WIGA; Digital library RSJD surakarta; Asshohwah E-Library; PLJ Digital Library; E-Library Parteker; Sangga Buana e-Library; E-Library Science Education; E-Library IAIN Madura; S1TE Digital Library; Digital Library Institut Teknologi Del; E library UNIK; E-Library Ganesha Pustaka; Digital Library PLM Politeknik LP3I Medan; e-Library Universitas Internasional Batam; S1TI Digital Library; e Perpus Ngudi Ilmu Digital Library; Ki Hadjar Dewantara E-Library; e-library STIKes Medistra Indonesia; Digital Library Smakanza; E-Library Perkasa; Digital Library FKIP UPR; Digital Library Universitas Widya Mataram; AMIK MBP DIGITAL LIBRARY; e-Library UMBY; e-Library SD Muhammadiyah Slawi; Digital Library Pendidikan Teknik Mesin; UNIGRES Digital Library; Sinar Ilmu E-Library; E-Digital Library of SMP Negeri 33 Palembang; Spewasti Digital Library; DIGITAL LIBRARY 26; Digital Library LP3I; Digital Library UIN Jakarta; Bioproses Digital Library; Grha Acitya Digital Library; Digital Library Spajising; SMP Peduli Anak E-Library; Sarwada Digital Library; MAN 1 Kota Madiun Digital Library; Digital Library SD-SMPN SATAP 2 KEDIRI; Digital Library FKIP UNIVA Medan; SMANSASERA Digital Library; Digital Library Smp Plus Murung Pudak; Tanjung Pustaka E-Library; e-Library Universitas Cenderawasih; SMAHA Digital Library; UPR Accounting Digital Library; Biology Digital Library; Digital Library UNU Yogyakarta; Digital Library STIKes Budi Luhur Cimahi; Perpustakaan e-library SMP 2 kuripan; E-Library STIE-I Rengat; Smaktud Digital

No	Vendors	Apps (Android Version)
		Library; digital library FAB UIN Surakarta; e-Library Universitas Pancasakti Tegal; Smalbi Digital Library; e-LIBRARY SMPN 4 LINGSAR; e-Library Universitas Bhayangkara Jakarta Raya; Perpustakaan Digital UNRI; e-Perpustakaan Islam; Digital Library E-Maos Pamekasan; Literasi Digital PPs UPS Tegal; e-Book USU Library; Digital Library STIKep PPNI Jabar; Digital Library PBI Murni Sadar; e-Library MTs Darun Nadwah NW Narmada; e-Library SMAN 1 Pangkah; Digital Library of SMAN 4 Sukabumi; Digital Library STIKes Cirebon; E Digital Library SMUNEL; SMPN 3 Sibolga Digital Library; Mansaja Digital Library; E Library SMP IT Miftahul Khair.
2	Bina Pustaka	e-Library Krakatau Cendekia; e-Library SMKN 1 Pandeglang; e-Library SMAN 1 Ngamprah; e-Library MAN 2 Kota Cilegon; e-Library MAN 1 Kota Tasikmalaya; e-Library Wana Hartika; e-Library MAS Al-Bidayah; e-Library Pelita Wira Pustaka; e-Library SMAN 1 Padalarang; e-Library MTsN 1 Kota Cimahi; e-Library SMAN 1 Ciamis; e-Library SMAN 1 Majalengka; e-Library SMAN 4 Cilegon; e-Library SMP Tunas Agro; e-Library MAN Bandung Barat; e-Library SMK Al Amanah; e-Library SMAN 1 Maja; e-Library SLB Al Fajri; e-Library SLB Nurhakam; e-Library MAN 2 Kota Serang; e-Library SLB Cahaya Gemilang Pertiwi; e-Library Titian Cendikia SMAN 1 Cikande; e-Library MAN Kota Cimahi; e-Library SLB Yayasan Cahaya Al Furqon; e-Library MAN 2 Sukabumi; e-Library SMKN 3 Pandeglang; e-Library SMAN 1 Batujajar; e-Library Al Murabby MAN 1 Kota Bandung; e-Library SLB C Puspa Mentari; e-Library SLB BC YPLAB; e-Library Bina Pustaka; e-Library SMPN 1 Pangkalpinang; e-Library SMAN Cimanggung; e-Library SMAN 2 Kota Serang; e-Library SMAN 5 Tasikmalaya
3	Gramedia Asri Media	Smart Library; MidiLib - Midi Digital Library; e-Library St. Bellarminus; E Library Loyola College; e-Library Yayasan Seri Amal; BRI e-Library; Digital Library UNIMED; E-lib BPK PENABUR Bandung; FIFGROUP e-Library; Gade Library - Pegadaian Digital Library; Gramedia Digital; eLib Kota Cimahi; Tulib (Tuban Digital Library); ePerpus - Perpustakaan Digital; UnejdigiLib; Astra Motor Digital Library; SMKPI E-Library; UBP Karawang Digital Library; Santa Ursula Jakarta e-Library; BTPN e-Library; Alfa Library; Stasiun Buku - LRTJ E-Library; e-Pustaka Bandung; Santa Maria E_Library

Discussion

The use of m-libraries is expected to increase in the future as demand for online access to library services continues to increase. This demand is exacerbated, in part, by the quarantining and social distancing measures of the COVID-19 pandemic that require users to have an information source that can be accessed online. These results will be useful for the information industry to access information and calculations related to library application data or m-libraries in use in Indonesia. In contrast to Indonesia, 40% of Scottish authorities did not intend to provide library applications in 2018, citing the increasing number of applications available and their range of functions as potential concerns. This was expected to result in gaps in access and use of m-library applications (Kerr & Pennington, 2018).

Advantages of m-libraries are that they can reach additional users, provide access to more expansive collections, and allow optimal utilization of library information sources. Disadvantages of m-library applications are that they require periodic preservation, including updates, fixing bugs and errors, and improving security and privacy (Aisyiyah, 2019; Mishra et al., 2017; H. Wang et al., 2019; Yasumatsu et al., 2019). Furthermore, sometimes users experience technical issues with any application that can disrupt their ease of use, such as an unstable internet connection. Therefore, there must always be upgrades for proper functioning of some features. One concern that remains an issue is the presence of malware that occurs in an application (H. Wang et al., 2019). In any application, there are user behaviours ranging from beginners to professionals, including users who are inexperienced but can understand an application easily and those who need direction or training when using a new application (Ocran et al., 2020). Libraries must also prepare user education content, such as direct training or recorded video tutorials on the use of m-library applications to help novice users. In short, an m-library application requires strong development from an internal perspective, namely in its features, preservation, and security, and from an external perspective related to user training and promotional factors. The m-library application is currently needed to meet the needs of online users with unlimited distances. This research contributes to the discovery of m-library applications used in Indonesia and illustrates that the library used as the m-library application model in its development. Thus, further research is expected to identify m-library application vendors and their specifications for the realm of schools and agencies so that appropriate recommendations could be suggested for libraries who want to start using the m-library application in their libraries.

The development of digital library services should be the goal of all libraries (Fatmawati, 2012). Librarians must understand technology ranging from developing mobile applications to predicting the impact of mobile technology on library services. Similar research regarding m-library applications, which showed that implementing the UMS Library application allowed the net generation to access library services using Android smartphones (Habib & Prasetyawan, 2016). Similarly, another study found that the features and appearance of m-library applications made it easy for users to access library services (Hariyani, 2019). By searching for the information to present in the m-library, a librarian's understanding of library material may become completer and more flexible. However, the ability of all users and librarians to navigate m-library applications remains a concern. Based on the explanation of previous studies, an analysis of the development of the m-library application in Indonesia until 2021 has not been carried out.

4. CONCLUSION

The development of a m-library in the form of a mobile application is intended to be used for online access of electronic books and services by library users. Our results indicate that libraries in Indonesia subscribe to the most applications on Kubuku e-resources, m-library software applications, or e-resources used in designing m-library applications, reaching 154 and 104 subscribers from Bina Pustaka and Gramedia Asri Media, respectively. Digital libraries in Indonesia that have not previously used an m-library application have a variety of choices, such as Kubuku, Gramedia, Bina Pustaka, and others, based on the needs of the application's users. Continuous improvement of m-library applications, both internally and externally, is necessary. Future opportunities exist for integration of m-libraries with other services. For example, users could read digital books in the m-library and place direct orders of books with a publisher that they wish to own on the same application.

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