Linking up library resources with digital rights management: Challenges and opportunities on Indonesia

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Abstract:

Radical changes in information technology coupled with the evolution of the Internet in the last decades has drastically disturbed the hitherto maintained balance between the interests of the library user, libraries and content providers. The library user, libraries, and content provider were empowered with new technologies that enabled the creation of born-digital content and the ability to distribute it around the world with virtually no effort or cost. As a fast-growing internet user in the world, the library in Indonesia has changed the way in serving library resources to users and content providers. Mobile apps has become a trend and is considered to be the easy way to transform library services. To stem indiscriminate copyright violation of intellectual property, libraries in Indonesia were pressured by content producers to develop effective copy protection systems inside library mobile apps. Digital Rights Management (DRM) is considered a solution. The aim of this research is to see the effect of implementation of DRM on the iPusnas mobile app with regard to library users, content producers and libraries. This research will try to see the challenges and opportunities of DRM implementation in Indonesia. This paper is using Plan-Do-Study-Act (PDSA) approach, which is a study on a problem and finds solutions to offer. This method involves identifying a goal or a purpose, formulates a problem, defines solutions and puts a

plan into action. Some findings are that the iPusnas mobile app is very helpful forl inking up the the content publishers and library users. The iPusnas mobile app with DRM has facilitated the access of library resources. Challenges faced by implementation of DRM include lack of interest from content providers in transforming their products into a digital format, and security and internet infrastructure that affect content providers when transforming their products into digital format. Conclusion of this research shows library resources with DRM is has high potential to grow fast in Indonesia.

Keyword: Digital Rights Management, DRM, iPusnas, Library Mobile App, Library Resource Sharing.

INTRODUCTION

Technology has become a basic necessity for human life and is also changing the way humans interact each other. Today many businesses are being transformed by new technologies, especially those that bring more intelligence and mobility to their operations and products. Some companies accelerate this transformation by pursuing IT-backed business innovations as a core strategy throughout their organization, according to a recent Harvard Business Analytical Services survey of more than 400 business leaders worldwide doing so. As business processes are changed because of technology, libraries currently face an era filled with uncertainty. This condition requires the library reshape (reshape) or Create (innovate). You could say the change is tremendous. The change has changed the civilization rapidly; the change not only in terms of human interaction with each other; but also, the interaction between people and technology and social institutions, including libraries. One of interaction that has undergone many changes include relationships with libraries, librarians and their users that transformed into a public space that is complex. The complexity of this public space is not only to accommodate the interaction between librarians and librarians in relation to access to information and knowledge, but also to inter-generational, inter-interests, inter-community, inter-professional meeting space interacting with librarians, technology, network. It is all glued together by library materials and library collection documents.

Currently the library collection is one of the library products that plays an important role in the business processes in libraries. The term "Document Delivery" literally means delivering the required document to a user. In that sense, it is almost synonymous with the circulation or lending of a document, whether from its own collection, if available, or obtained through inter-library loan. However, some people use the term in a narrower meaning i.e., "provision of material that may be retained by the user." Due to technological developments in the fields of reprography and ICT, it is now possible to provide documents in hard copy, prepared by using reprographic techniques, or soft copy by scanning the original text and saving it on a CD or DVD.

Today, content s is increasingly found in digital form and is distributed using the web. The ease of copying material has created a need to develop a means to protect it. Digital rights management (DRM) tries to find a solution to this problem inside a triangle set of technology, economics and law. The optimal solution is a compromise between technological possibilities, cost, ease of use, privacy and rights defined by law. The proposed DRM architecture uses some technological methods as well as threats of financial losses to protect the content. The objective of DRM technology is to provide as safety mechanism for the complete content management lifecycle, focusing on the aspect of management and control.

More formally, DRM involves the description, layering, analysis, valuation, trading, and monitoring of the rights of an enterprise's assets, both in physical and digital forms and of tangible and intangible value. DRM covers the digital manifestations of a work or rights in a digital manifestation of a work (Iannella, 2001).

Indonesia, a country with a population of more than 256 million, is a potential market share for all products. One of the most popular products among Indonesian population are gadgets. In 2016, Wearesocial, a research agency, released data that showed approximately 326.3 million Indonesian people are connected use mobile technology and 88.1 million are active internet users.As many as 79 million Indonesians are active in using social media. Meanwhile, Kompas Research and Development Agency in 2016 released a study that showed most Indonesians using video games are those aged 18-25 years old; followed by those aged 26-35 years. In the literacy rating survey, library development in Indonesia ranked 36 out of 61 countries, beating China which ranked 61st (CCSU, 2016). This happened because there are a number of new services and innovations performed in libraries in Indonesia. One innovation established by libraries in Indonesia implemented information technology in various forms in business processes in document delivery services with Digital rights management (DRM). This research is trying to see the effect of implementation of DRM on libraries in Indonesia.

LITERATURE REVIEW

iPusnas

iPusnas is one of the latest innovations from the National Library of Indonesia's (NLI) collaboration with Aksaramaya, a start-up company. Theinnovation is building digital content so that users have many options for accessing information. The development of digital content is one way to increase visits to libraries so that users have many options for accessing information. One of many ways of transforming the library content is by digitizing library collection whose copyright has expired, besides adding the subscription of commercially produced databases, electronic journals and books, and other electronic resources regularly purchased or licensed by libraries. In addition, the NLI also cooperates through Digital rights management (DRM) technology with content publishers.

Due to the growing trend of mobile device usage, Gartner, Inc. estimated that "computing everywhere" wase the top trend in 2015 and social media also will become a mass puller to improve reading culture in Indonesia. Based on that, NLI launched a mobile app based application called iPusnas, which transformeddigital-based media. iPusnas also has the potential to be a central repository that can be accessed from PC, tablet PC, Android and Apple devices. Since the early launch of iPusnas, it has already been downloaded 18,000 times and today, there are 34,269 users, with 22,237 active users. iPusnas contains 78 book categories with 12,834 individual book titles and 125,876 copies.

Figure 1. iPusnas Mobile App

Digital Rights Management

DRM can be interpreted as a system used to protect the copyright of digital content (Nicholson, 2009). DRM is a term given to a set of technologies used by digital content publishers (such as music, video, or text) to control the use of content (such as by library users) so that information can be used (Puckett, 2010). DRM is a solution of an information security technology system that protects the copyright of the creators and owners of digital media while simultaneously protecting the convenient use of digital content (such as images, audio and digital video). In addition, the DRM system can identify digital copyright identities when encountered with illegal use. Based on the above DRM definitions, it can be concluded that DRM is a technology that can be used to control the use of digital content from unreasonable use and as a form of copyright protection by author or publisher which can be done by limiting users to access the digital content. DRM functionality has three main areas described by Diehl (2012) as follows:

1. Rights Management
   In the field of rights management DRM has two functions, namely *creation* (creation) and *validation* (validation). The *Creation* function can be described as in the creation of a required content process such as editing. Then the creator uses the *content provider* (content provider) to distribute his work. In some cases, the creator may also be a content provider. The content provider defines the rights of the use of content. These usage rights may vary for each consumer or depend on commercial ties. Usage rights are not always associated with bids in commercial form. Thus, it can control the right of use to prevent piracy. For example, DRM can define who can access the content, who can make modifications, and who has the right to send it. Function *validation* (validation) is for when the user tries to use digital content. At that point DRM will check the validity of the use rights. It verifies whether the user has the right to perform the action requested. If the user does not have credentials, DRM will not grant permission for the action requested.

2. Content Management

In the field of content management, DRM has two functions, namely *repository* (repository) and *trading* (trading). The repository function allows DRM to protect the repository that manages all the available content. Usually, content is stored in encrypted form to prevent theft or leakage of content. The function of both is *trading* (trading), in this case DRM can provide a means to sell and deliver content to the user. This function has two main tasks, namely *packaging* (packaging) and *payment (*payment). The *packaging* task in DRM is the task of distributing content. In this function, the content is converted into a format that supports the user environment and protects it with cryptography to bind its licenses. Task *payment* (payment) is a task in DRM to ensure that content owners will be given in return for the use of content.

3. Usage Management

In the field of user management, DRM has two functions, namely *enforcement* and *tracking*. Function *enforcement* (enforcement) in the DRM function is used to ensure that consumers will respect the rights of use granted. The *tracking* function (tracking) is used when a user requests the use of a content. Tracking may be mandatory in a corporate environment to audit who is editing or viewing the content and when it occurs. DRM technology is designed to protect content and copyright from threats. Agnew (2011) provides three strategies to protect it:

a. Deterrence is usually a nuisance factor, in which there is an attempt to make an inappropriate use of digital content and avoid DRM protection. Deterrence is a major method of copyright protection in digital space.

b. Prevention, in particular, prevents unauthorized access, use or destruction of protected content, represents the traditional function of DRM systems, especially those that have been generally used as "access control " or " copy control " systems.

c. Detection (detection) isoften referred to as forensic technology because it is intended to prevent or restrict the use of content once it is distributed. This detection technology emerges as a strategy for content owners to exercise control over their digital content. Forensic technologies often involve traceable and traceable watermarks. In addition, other technologies are used such as matching patterns to find copies of content on the Web.

Specifically, DRM systems are designed to allow access and use of digital content and to restrict any copying, dissemination, change of form or any form that alters the content. But there is one undesirable consequence of DRM implementation in that buyers are locked on specific e-reader e-books. While EPUB is the standard file format for e-books, companies that use EPUB files in their e-reader devices can use DRM to limit their EPUB usage to specific devices. This has an impact on consumers who can only buy e-books from the same company as their e-readerdevice. It also means that libraries can only lend books to specific devices, and users can only access several titles of books available in libraries because of the devices they use. DRM can also limit what libraries and users do with e-books. DRM can be used by the vendor to automatically delete the file after the loan term expires. This is called the lending model "one reader, one book." DRM can also be used to restrict the reader from borrowing an e-book that other users have borrowed or limit the number of times an e-book can be borrowed (American Library Association, 2012).

METHODOLOGY.

This paper is using the Plan-Do-Study-Act (PDSA) approach, which is a way to study a problem and find solutions to offer. This method involves identifying a goal or purpose, formulating a problem, defining solutions and putting a plan into action (Deming, 1991). The first stage, the Plan, is to implement document delivery with DRM method embedded with the iPusnas app. The second stage is Do, in which data collecting is conducted by carrying out surveys and interviews to collect some data and see any challenges and opportunities of document delivery with DRM using iPusnas. Data covers accessibility of iPusnas covering the initial visit, document delivery, duration of use and region that iPusnas were accessed. The third stage is the Study in which the collected data are analyzed for possible solutions that can be offered through a comparison between the document delivery with DRM using iPusnas system that supports the needs of a digital society. The last stage is Act where solutions are presented.

FINDINGS.

Plan DRM with iPusnas

NLI in developing a digital library issued an e-mobile library application called iPusnas. iPusnas is a digital library application (epustaka) equipped with e-reader for reading e-books and social media features, owned by NLI in cooperation with PT. Woolu Aksaramaya (Aksaramaya) as an application developer.

The existence of iPusnas allows users who cannot visit the NLI campus in person to still access digital content in libraries. However, iPusnas does not necessarily freely open the digital content because related to copyright protection of the digital content. Therefore, in protecting and securing its digital content, iPusnas implements DRM as one of the efforts undertaken to prevent piracy and provide the option to control in the use of copyrighted digital content. The use of DRM is important for iPusnas to protect the copyright of digital content from unauthorized dissemination and stem the tide of copyright infringements and the economic losses suffered by copyright holders. The application of DRM allows iPusnas users to access digital content while protecting copyright of content owners.

Before iPusnas could be introduced to the patrons, the NLI needed to do considerable planning and preparation. The NLI collaborated with Aksaramaya, a start-up company to create the iPusnas app. There were several issues the NLI and Aksaramaya needed to consider when making this service available: customization of the user interface, user registration and training, promotion of the service, and tracking usage. A committee was established to do this work. A number of changes to the standard iPusnas interface needed to be made. Most customers of document-delivery services up to this point were companies who set up accounts and let the reader / users order documents as needed. For an unmediated document delivery service to work in all settings, a number of changes had to be made. The committee decided to let NLI users order books directly from the iPusnas app. Other choices, including options to purchase books, were removed from the menu.

Do DRM with iPusnas App

DRM on iPusnas set 5 things: who, what, when, how, and how many. Who regulates who can read the digital content available on iPusnas. What organizes any content that users can

borrow and read. When sets up loan periods. The How works on how to access and manage the amount of content that can be borrowed. The Maya Script deermines the license. The License applied to iPusnas governs who will access the content and metadata.

The iPusnas app will provide content from Publishers who have collaborated with Aksaramaya. They will upload their digital content to Aksaramaya's servers, with everything in EPUB and PDF format. Aksaramaya stores all of the publishers' digital content on its servers. But if iPusnas want the digital books in the iPusnas app, iPusnas must buy it from the publisher. If it has been purchased Aksaramaya will open the digital books in the iPusnas app.

The policy must be established by the information manager, in this case, NLI and Aksaramaya. This arranged policy is limited to ePustaka Popular, which is an e-Library managed by the NLI. The above-mentioned policies are in accordance with the Seringhaus (2010) statement that for e-book purchases, it is often accompanied by a user license agreement containing a contract to restrict the user's right to use e-books, including the right to sell or transfer e-books or to copy or distribute content from an e-book without publisher permission. A complete access policy for users is in the terms of service available in the iPusnas app. Related things that the user are not allowed to do include:

a. Copy (except users who may make modified copies of the Software solely for the personal use of users on devices owned by users, subject to the terms and conditions of this Agreement), modify, create derivative works based on, or distribute the Software or the Files,

b. Reverse engineer, translate, disassemble, decompile, or otherwise attempt to discover the source code or structure, order and organization of the Software (except to the extent that applicable law prohibits reverse engineering restrictions),

c. Rent, lease, transfer, resell or use the Software or Files for the purposes of the timesharing or service bureau, or use the Software or File for commercial purposes or on behalf of or for the benefit of any third party;

d. Allowing other persons or entities to use the Software or File. The User shall retain and not remove or obscure any proprietary notices in the Software and File and will reproduce precise notices on all authorized copies of the Software or the File.

Study DRM with iPusnas

In this part we will study the DRM in iPusnas application in three aspects. They are:

1. DRM content license in iPusnas

The DRM work process at iPusnas begins with the licensing of digital content owners to Aksaramaya. in the form of digital copyrights (digital copyright). Aspects of copyrights (copyrights) managed through Aksaramaya DRM are obligation or agreement, restriction, or restriction and license. The following is transaction protection scheme on DRM Aksaramaya.
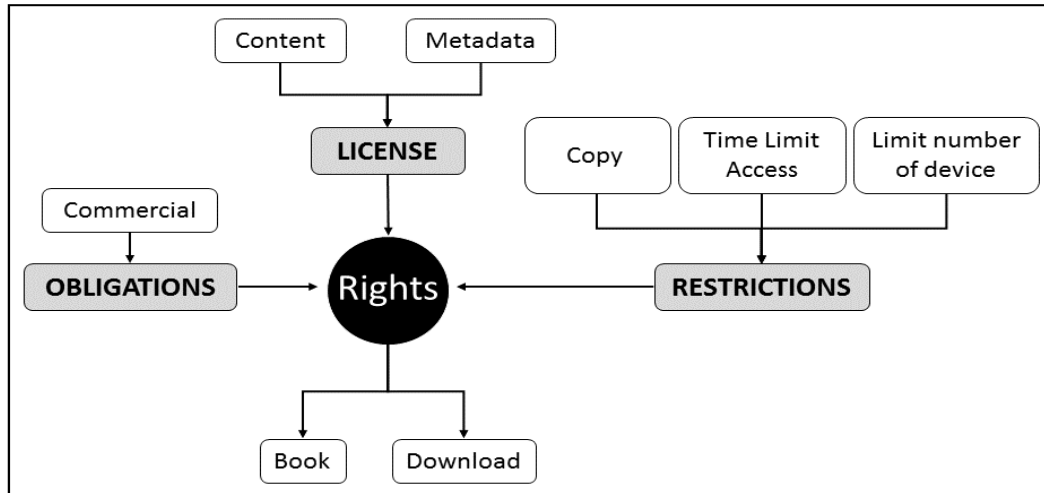
Figure. 1. Aksaramaya DRM Protected Transaction

The first aspect is the obligation or agreement which is the aspect of copyright relating to commercial contracts, determining the amount of content, distribution, term of cooperation, rights and obligations. The second aspect of copyright is managed through Aksaramaya. is a restriction or restrictions. Restriction or restriction is a system that includes permissions restrictions that are allowed and are not allowed in accessing content such as copy constraints, device constraints, and access time constraints. iPusnas provides restrictions to users as described by Hombal and Prasad (2012, p 235) that DRM refers to restrictions on the use of digital content and device restrictions. Restrictions applied to iPusnas include 3 things, namely the copying limits, access deadlines, and limits of what devices (devices) that can be used. The Third is aspect of copyright managed through the Aksaramaya is a license. The license applied to iPusnas governs content and metadata. Publishers who have collaborated with Aksaramaya will upload their digital content to the Aksaramaya server provided that the content formats must be EPUB and PDF. The Maya script stores all publisher digital content on its server rather than in the iPusnas app. But if iPusnas want the digital books are in the iPusnas application, iPusnas must buy it to the publisher. If it has been purchased, the Aksaramaya will open the digital books in the application iPusnas.

2. Authenticate iPusnas app users

User authentication is a process of validating users, computers, or multiple digital objects to ensure what a user can claim (Arms, 2000, page 101). User authentication occurs when the user enters the iPusnas app. There is a requirement in iPusnas that must be fulfilled by the user to be able to log into iPusnas. First, users must download the iPusnas app via the website www.iPusnas.id for hybrid format for access on a computer, in the Play Store for Android devices, or the App store for Apple devices.. Secondly, once the application is installed the user must register in the application by filling in the e-mail address field, name, phone number, and password. Aksaramaya applies DRM to ensure that the content Aksaramaya receives is content that is licensed and the rights of the content is managed by Aksaramaya.
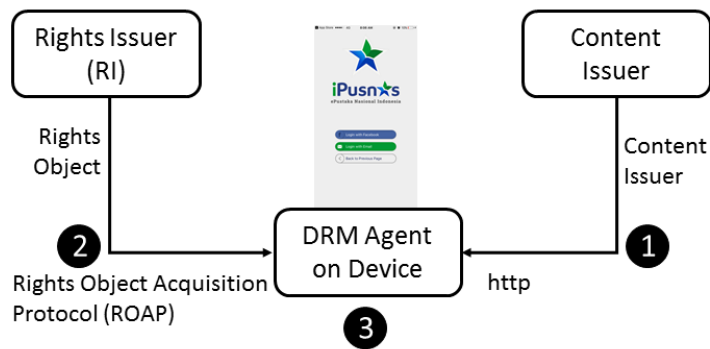
1. DRM Agent request Protected Content
2. RI handles Generation and Delivery of rights object. Rights object includes usage rules.
3. DRM Agent decrypts protected content and enforces usage rules.

Figure. 2. Content Access Procedure

1. Identifikasi dan Autentikasi Konten Digital

Authentication of digital content can provide assurance to users and collection managers that the content has not changed or been used inappropriately. Libraries in this area should seriously consider the use of authentication methods for digital content (Arms, 2000, page 101). Aksaramaya, in an effort to maintain authenticity of digital content, uses cryptography as an iPusnas user authentication method.. Cryptography, based on DRM explanation document from Aksaramaya, is an effort done to keep data safe such as for data confidentiality, data validity, data integrity, and data authentication when sent from sender to recipient.

Encryption is a standard method for protecting digital content from unauthorized users, until keys are used to encrypt content and make it usable by key owners (Pal, 2014, page 12). The encryption process starts from the entry into the application, and then is encrypted and gets back the kernels, and ultimately is made accessible to the user. This is explained also in Figure 4 which is a form of content security in iPusnas until content can be user-used.
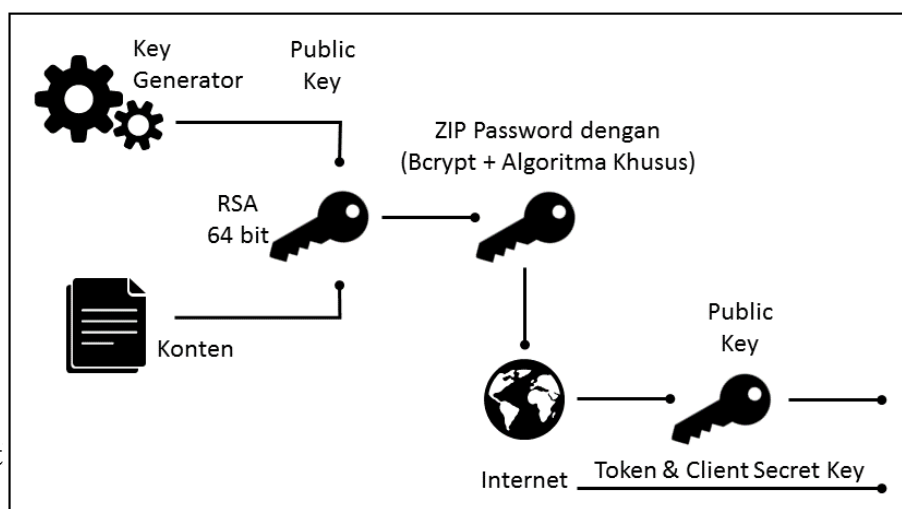
Act DRM wit

The NLI applies DRM to the iPusnas application as a technology used by copyright holders to protect digital content and license rights made through cryptography and management of users' digital media usage. The implementation of DRM in the iPusnas app is primarily illustrated in the DRM protection transactions scheme on iPusnas that includes licenses, bonds, and restrictions (restrictions). Aksaramaya is licensed by the publishers to be able to distribute such content. Subsequently, bonds are an aspect of DRM relating to commercial contracts, the determination of the amount of content, distribution, terms of cooperation, rights and obligations. As well as restrictions (restrictions) associated with systems that include permissions restrictions that are allowed and are not allowed in accessing content such as copying constraints, device constraints, and access time constraints.

The access policy is applied to users is entirely translatable within the application. The prepared access policy is based on an agreed license agreement between Aksaramaya and the content publishers. User authentication is a process whereby the user to be able to utilize the content inside iPusnas app. In terms of security Identification and Authentication of digital content, iPusnas simply uses encryption because encryption can already perform digital content authentication function. However, for digital content identification cannot be done because Aksaramaya is not allowed to make any changes to the content.

iPusnas as a book-based social media app has many features in it which allows users to share info about the details of a book. As the result the NLI and Aksaramaya create iPusnas with features as follows:

1. Connect with Facebook feature is a feature in iPusnas that users can use to register themselves via a Facebook account. In this case, e-mail listed in Facebook will be used to register the user in the iPusnas application.

2. Connect with E-mail is a feature available in iPusnas where users canregister themselves using e-mail addresses.

3. In Profile Settings users can add information to their account profiles such as, a photo, username, e-mail address, address, password, and biography.

4. The Notification feature is a private information notification sectionUsers can comment, share-recommend, add new followers, be given badges, send and receive messages, and "like" comments.

5. Inbox is a feature used to have conversations with other users. To be able to have a conversation with other users, the user must log into the user's profile then click on the appropriate chat button located on the top right of the user profile, from which the user will then log into the chat page.

6. Badge Status is a feature for the user's reading level. There are several levels of reading iniPusnas such as Newbie, Bookworm, and Socializer. For newbie level users who want to level up to bookworm, they must complete a profile, post more than 5 comments, download 10 books, open and read 5 books and fill out a voucher. As for users who are at the bookworm level, if they want to level up to the socializer level, they must follow 10 users, share a book 10 times, recommend a book 5 times, and get 10 followers.

7. Book to Finish is a collection of books that users have borrowed. In it there is information about the percentage of books read, as well as the deadline of book lending.

8. Store Library is a catalog of books and also serves as a store in the iPusnas app. Features contained within it include categories, book search, and recommendation books.

9. ePustaka is a collection of agencies or publishers who have collaborated with iPusnas.

10. Book Details is a feature details of the books will appear such as the title of the book, author, ISBN, publisher, publication date, book rating, book price, synopsis, wait list, who is reading the book), who has finished reading the book, and reviews.

11. Share is a feature where users share info about book details. Users can share these details via Facebook, Twitter, e-mail and Recommend. Share recommendations feature is used to share book information by sending notifications to users who have followed each other.

12. Book Shelf is a feature for a collection of books that already owned, the desired collection, as well as a completed collection.

13. E-reader is a feature to read e-book with EPUB format equipped with TOC (Table of Content) where user can view table of contents of e-book, Change Font Style, Change Font Type (change typeface) Line Spacing, Change Theme, Bookmark, Search (search for words or phrases in e-books), manage lighting when reading e-books, make notes, and recommend e-books read to other users.

14. Feed is a collection of information that is public. Information included are followers that add books, followers who join ePustaka, changes to User Badges Status, new books added in the e-library followed, and notifications from the iPusnas administrator.

15. Notes is a feature inside the app used to store notes.

16. iPusnas Offline is a feature that can be used whether a device is online or not. When offline, users are only able to read books that have been previously downloaded.

DISCUSSION

DRM Implementation Opportunity in Indonesia

The concept of iPusnas is only different because of the digital form. With iPusnas, librarians do not have to worry about books that are not returned by users because the method of borrowing and returning books is set in the system. In addition, the preservation of the collection certainly is not a problem because the book will not be lost, stolen, destroyed, or deleted. The establishment of iPusnas is also seen from the potential of the NLI to be the center of a repository, but the current state encountered is the barrier of copyright when libraries will serve its digital collection. To that end, iPusnas is equipped with DRM technology that can manage who reads, what is read and when, how iti read, how much is read, and so on.

Implementation of DRM in Indonesia has a very good prospect but there are some things that need to be considered in the implementation of DRM in Indonesia, among others:

1. Regulation

   Regulation is a very important issue; thhis includes the regulation of electronic transactions that in Indonesia has not been much about the delivery of documents. In addition, DRM is new to Indonesia where there is historicaly not many rules and regulations about digital copyrigh.

2. Infrastructure

   Infrastructure is a very basic thing in the implementation of DRM. Indonesia's digital economy is an area of great potential with growth in a year estimated to be worth US $130 billion. On the other hand, this rapid advancement of internet communication in predominantly urban areas of the archipelago is only part of the story. While the number of Indonesians has been upped by the global trend, Indonesia's internet penetration remains only around 50%, with Java and Sumatra's Java-Sumatra. The digital growth is not a matter of the level of access to technology and materials infrastructure, but also a broader range of factors that shape people's opportunities for adopting digital media, like gender, education, socio-economic status and age. Adoption goes beyond technology access per se, as it depends on people's awareness of the potential benefits of using such media as the internet. In that sense, internet skills go beyond the practical computer skills and require specific forms of digital literacy.

3. Content Provider

   Since everything seems to be going digital, people can now carry their music, notes, movies, and books in their pocket. And now, in Indonesia'spublishing industry, digital book platforms are becoming a growing trend. There are many start-ups trying their luck in this industry, and most of them have similar concepts: partner with book publishers, provide digital books or magazines, and let people access them. Although publishers are preparing to enter the digital age, Indonesians still prefer print materials. The e-book sales are still far away, and the research done by Indonesia Publisher Association in 2016 shows the average e-book that is downloaded is free., People still choose the physical books when they have to purchase the books. While people are comfortable reading newspapers in a digital format, that has not translated to books.

DRM Challenge in Indonesia

The challenge of mobile and digital apps is because of barriers to copyright as libraries provide digital content. Digital content is related to DRM which regulates who gets to read. It also regulates, what they get to read and when, as well as how the books are read, how many books a user may access at one time, , and other variables. DRM also secures access of digital content with encryption technology so the reader can have access to the fulltext collection that has been indexed in iOS or Android and can be displayed in iPusnas as long as it is permitted by the publisher, or libraries that have joined can provide iPusnas. This innovative strategy at NLI involves many stakeholders, therefore, mapping potential stakeholders was conducted as early as possible so that all stakeholders were involved in IT innovation. There are many external parties involved in NLI innovation, such as ministries and agencies, provincial and district/city public libraries (partner networks). There is also involvement of the private sector in NLI strategic programs, such as the procurement of hardware vendors and software developers and others.

Challenges faced by implementation of DRM include lack of interest from content providers to change their product into digital base publishing, and security and internet infrastructure affecting the content provider in transforming their product into a digital format. There are some problems when libraries are getting connected and have to network with each other. Those problems are:

- Content - the contents of a digital library
- Value added - easy to access, cheap and so on.
- Display and function - ease of use of the system.
- Technical - software, hardware, browsers, etc.
- Copyright - rights, fees, etc.
- Service impact - training needs, promotion, etc.

These six problems have to be compromised among stakeholders when we collaborate and are connected to each other. These areas are six priorities of the NLI strategy in the development on IT-based libraries. It takes a joint commitment to build IT-based libraries to keep this program sustainable.

CONCLUSIONS

The iPusnas mobile app with DRM has facilitated the access to library resources. This is a great achievement of NLI in collaboration with start-up company the Aksaramaya to ensure the people access to library materials and securing copy right for publisher and authors.

Challenges faced by implementation of DRM include lack of interest from content provider to change their product into digital base publishing, and security and internet infrastructure affecting the content provider in transforming their product into digital format. Conclusions of this research are library resource with DRM has high potential to grow fast in Indonesia.

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