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**Complex legislative repository- Parliament of Thailand:
development of mobile access.**

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1) Session 103 — Open source technology and mobile devices use
and accessibility — *Information Technology with Library and Research
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Abstract:

*Tthis paper describes the design and development of mobile application for accessing the largest
digital library for legislative collection in Thailand, called LIRT- Legislative Institutional Repository
of Thailand. It is provide access to millions of digital items, including legislative documents and
related e-books, journals, newspapers, videos for the entire nation. As the number and size of
National Assembly's documents grow dramatically every year, in order to serve the public, we
need a scalable yet reliable system to handle this massive load. The working group chose to
substantially extend the DSpace, an open source repository system, to serve as a cost effective
core repository system. Along with 10+ cluster nodes for server farm infrastructure, Google
Search Appliance for the search engine frontend, LDAP server is implemented as main*

authentication service, a Digital Rights Management system to authorize user access, web and mobile client to allow patrons to download and access digital contents off-line via Windows, iPad and Android devices.

Since the repository comprise of both open-access and licensed documents, the DRM-Digital Rights Management system have been developed to manage the access policies, encode the documents and authorize user. In this project we have also developed dedicated mobile appellations for Windows, iOS and Android devices.

The heart of DSpace is a free and open source (FOSS) storage and retrieval system, which allows the repository to be scalable and customizable. Potentially, DSpace will lead to the creation of a virtual library that meshes the collections of various research libraries. DSpace repository has OAI-PMH built-in which means that it is ready to communicate with other repositories, thereby making future cooperation of different legislative departments with other libraries very easy.

Introduction

According to Mr. Charae Panpruang, Deputy Secretary-General of the Secretariat of The House of Representatives, providing access to legislative information is of great interest to the Secretariat of The House of Representatives. The information consists of complex official documents from various legislative processes and a compilation of materials generated at each legislative stage. The materials are inter-related and cross-reference each other. It was crucial to find the right mechanism to manage these materials to ensure access and support developmental goals.

Mr. Charae suggested that the parliament needed to find the right mechanism to create a high standard digital library that provides better access to the National Assembly collection. Another goal of the project was to reduce the space needed for print copies in the new Parliament building. In addition, ensuring long-term preservation by creating digital copies was also a priority.

The Parliament established a working group to develop the digital library. Adisak Sukul, Ph.D., was invited to serve on the working group as a consultant for digital collection development. As the number and size of National Assembly's documents grow dramatically every year, in order to serve the public, we need a scalable yet reliable system to handle this massive load. The working group chose DSpace as the answer, and it's cost effective too.

Adisak is also the EIFL Thailand Coordinator for OA/FOSS. He gained a deeper knowledge from the UNESCO and EIFL funded workshop on Open Access and Digital Libraries using DSpace.

Implementation details

The National Assembly of Thailand Digital Library project is comprised of a numbers of modules: DSpace for the repository, 10+ cluster nodes for server farm infrastructure, Google Search Appliance for the search engine frontend, a Digital Rights Management system to authorize user access, web and mobile client to allow patrons to download and access digital contents off-line via Windows, iPad, iPhone and any Android devices.

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Even though DSpace has a lot of great functionality which fully met the requirements of this project, further development of the software in various modules needed to be done. For example, for the search function it was necessary to use a third party module. So it was decided to implement Google search instead, "We chose the Google Search Appliance to fill the gap, the very first implementation in Thailand, and it did the job very well" Adisak added.

This project will support the work of Parliament's members, Commissioners, Government Officers, and all stakeholders. It will also raise the visibility of the Legislative Institutional Repository by employing the newest IT solutions to publish the legislation knowledge to the people.

For the Mobile perspective, which is becoming very important client for off-line accessing the content these days, applications need to be developed correctly and effectively cooperate with the DRM and also with the main repository system. The mobile applications need to response to all functions and policy from the DRM server, i.e. document lending policy, dynamic watermarking, expiration policy, save/print policy and most important is the document have to kept encoded at all time in any user devices.

System structure
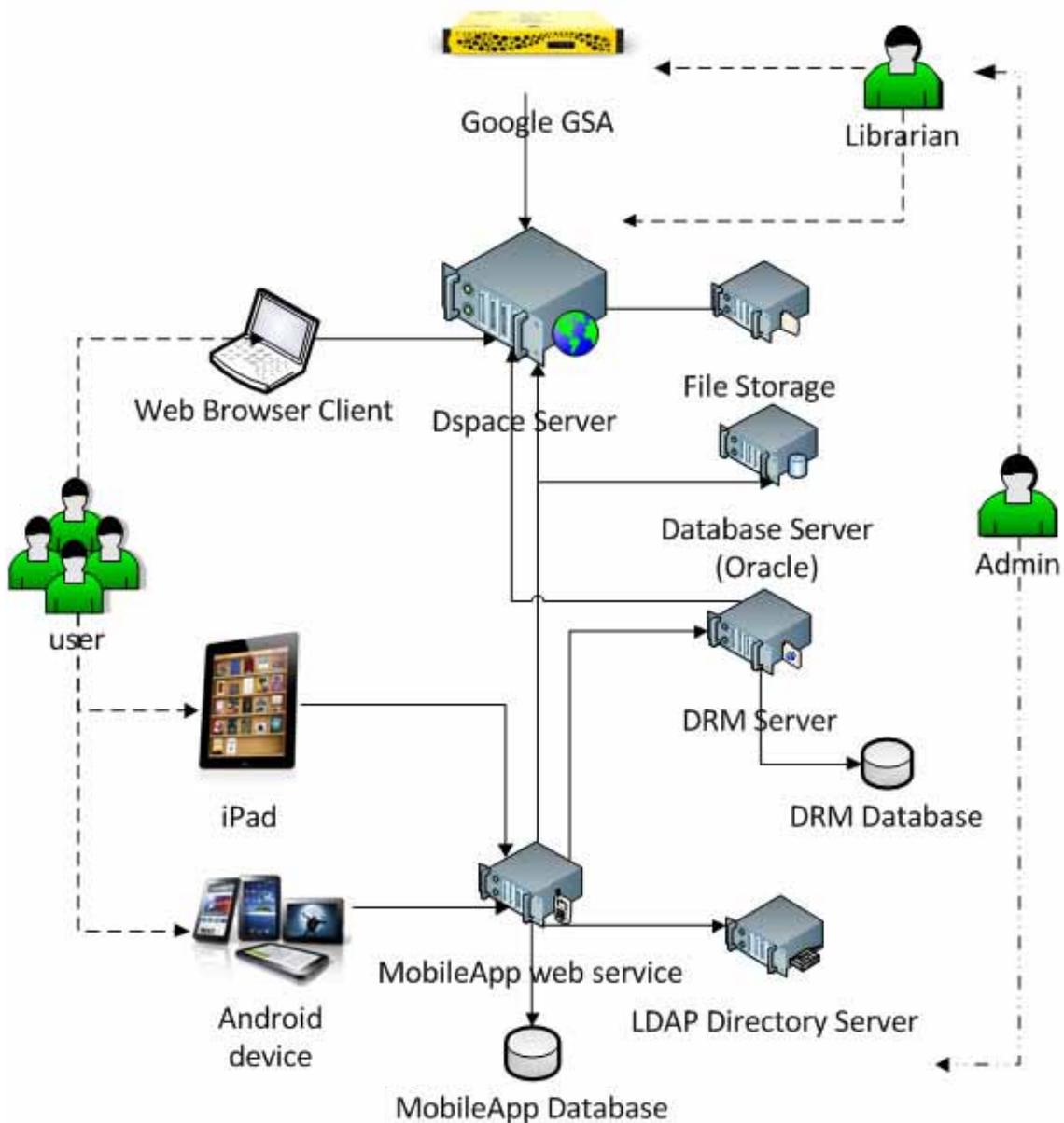
Fig.1. LIRT- System structure.

LIRT - Legislative Institutional Repository of Thailand system structure comprise of multiple component. Multiple user experiences are provided by the LIRT system, including Web Browser Client, iPad (iOS) and Android devices. Following of this paper will explain by flowchart and display screen capture of LIRT mobile applications.

Mobile application process


Fig.2. LIRT user experience through Android browser.
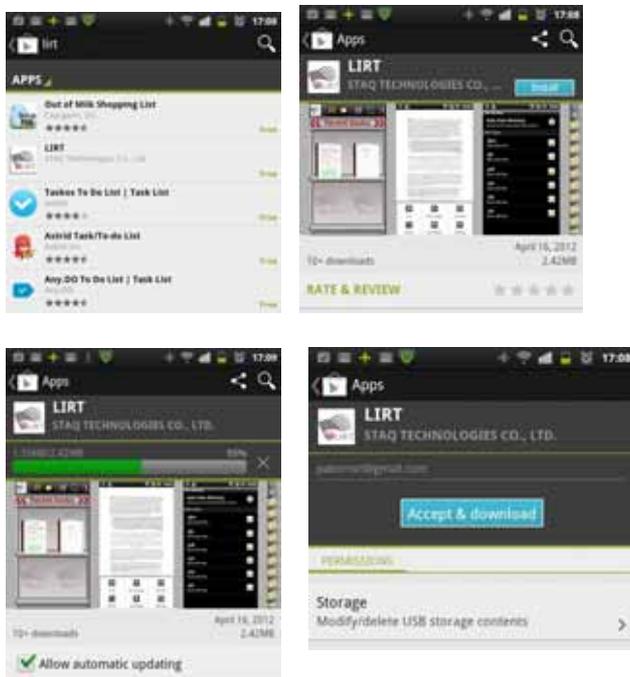
Fig.3. LIRT mobile application for Android devices installation.

Fig.4. LIRT mobile application for iPad (iOS 5.x).
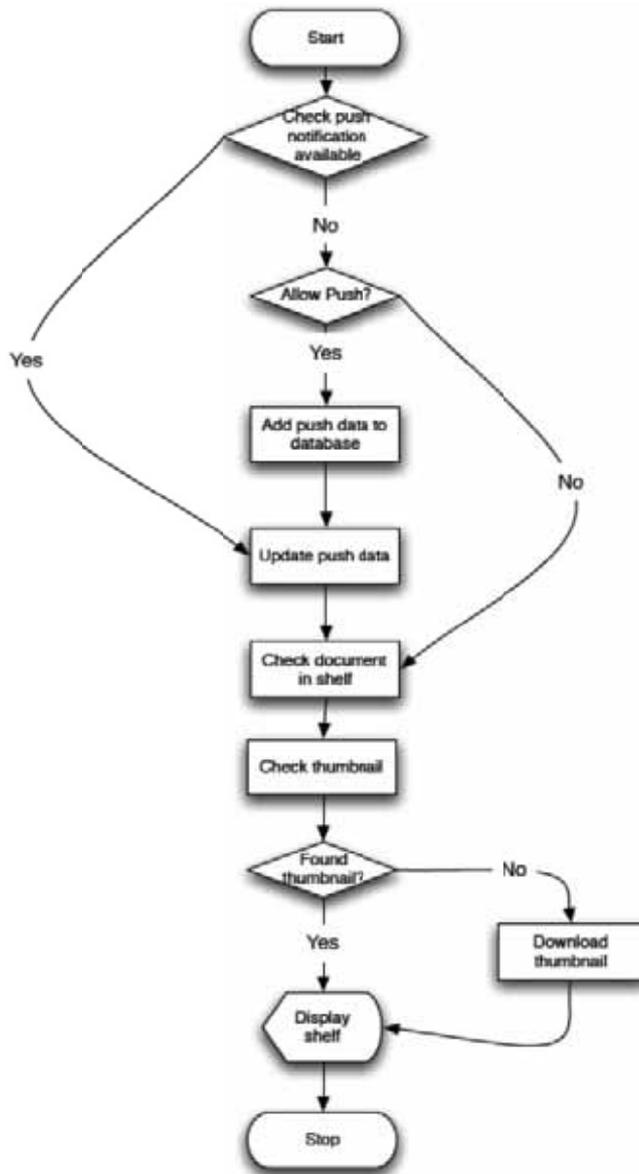
Fig. 5. Flowchart of mobile application startup process.

Fig. 6. LIRT iPad application startup screen with bookshelf.
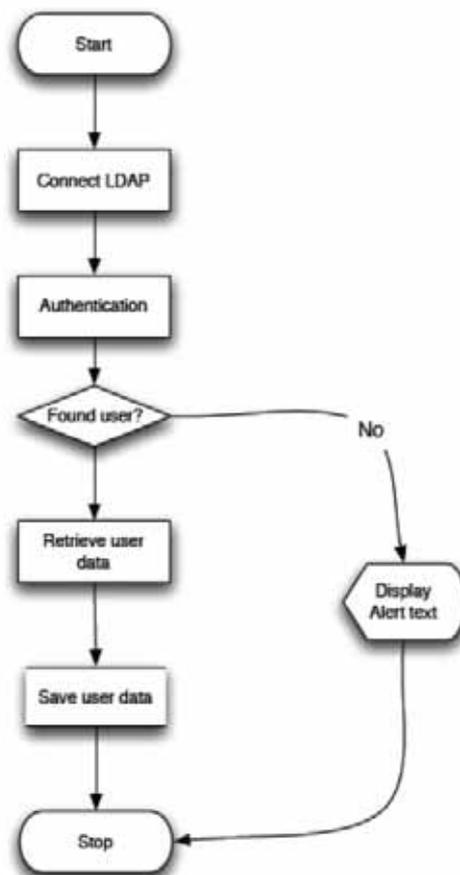
Fig. 7. Flowchart of user sign-in with LDAP server through mobile application.

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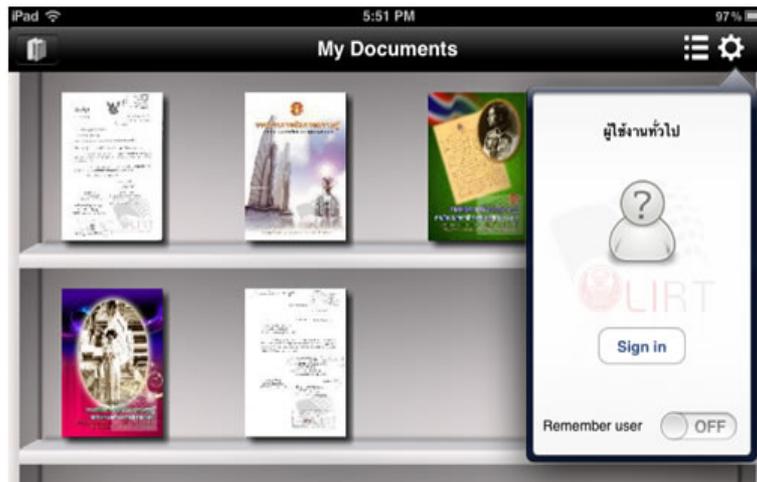
Fig. 8. Flowchart of user sign-in with LDAP server through mobile application.
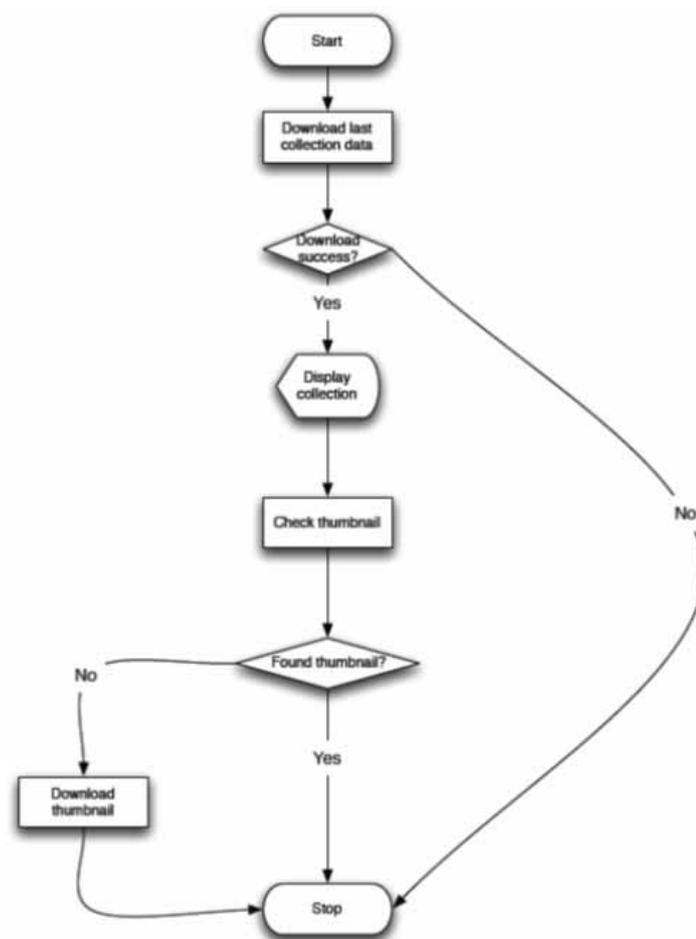
Fig. 9. Flowchart of mobile application document browsing process.

Fig. 10. LIRT iPad application browsing for documents.
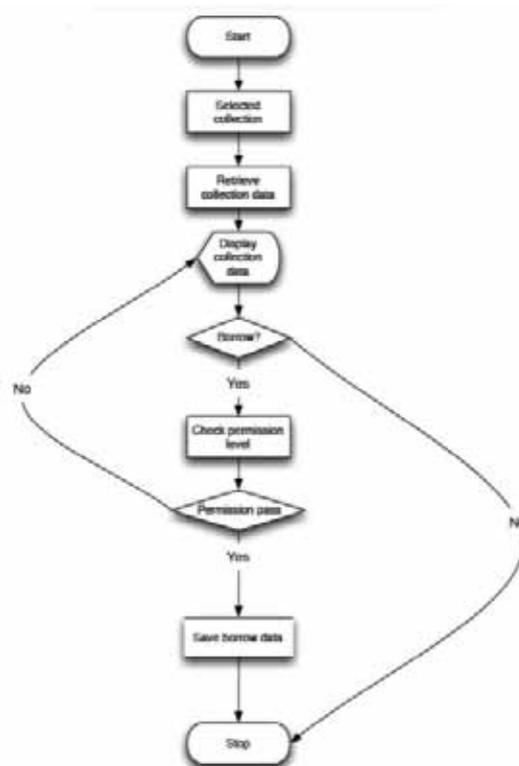
Fig. 11. Flowchart of checkout document process with DRM server through mobile application.
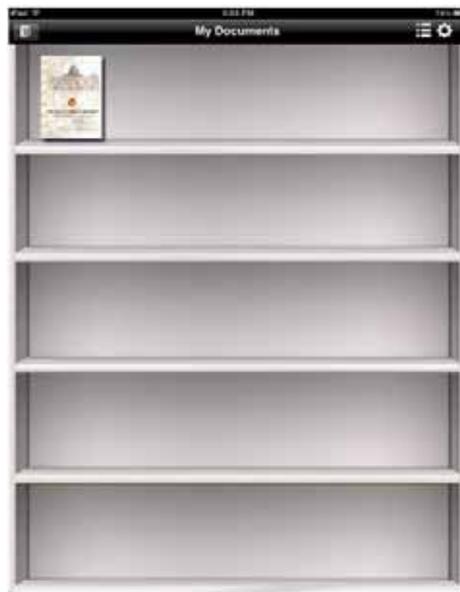
Fig. 12. LIRT iPad application checkout document and appear on user's bookshelf.
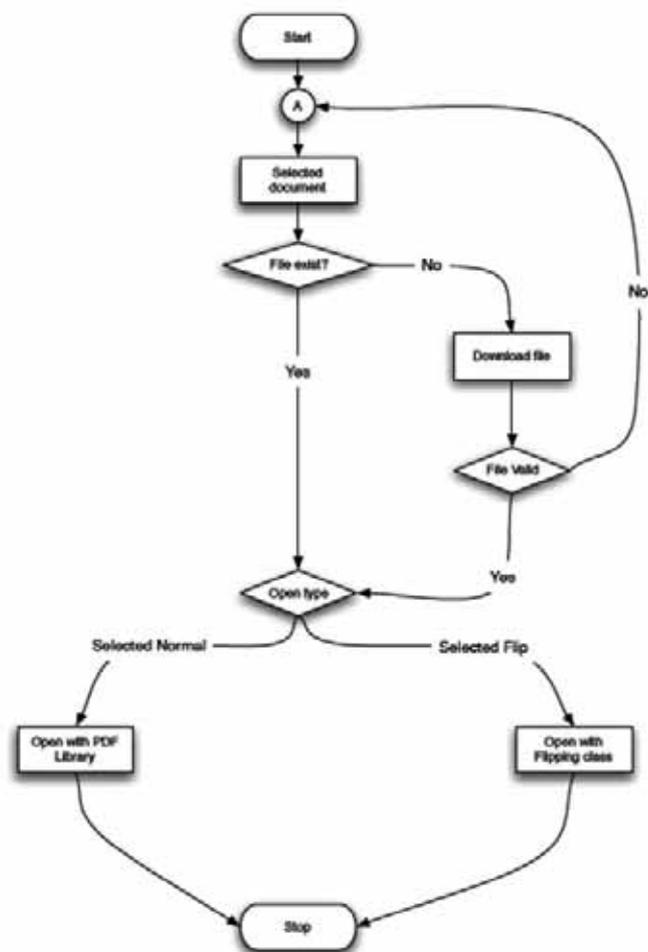

Fig. 13. Flowchart of mobile application document verification and display process.

Fig. 14. LIRT iPad application displaying document (normal reading).
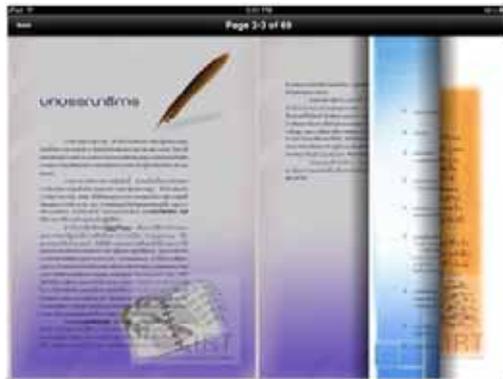
Fig. 15. LIRT iPad application displaying document (page fliping).

Fig. 16. LIRT Android application displaying document.
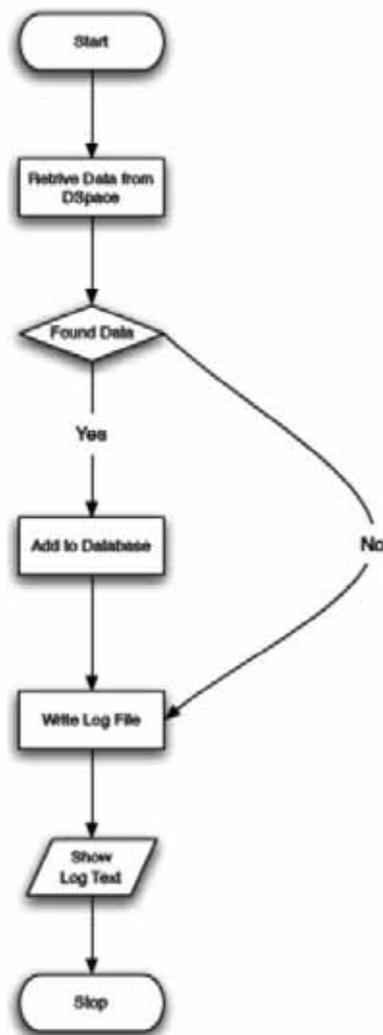
Fig. 17. Flowchart of MobileApp web service document updating process with DSpace.

Conclusion

This paper described and showing the system structure, flowchart and screen capture of a mobile application for accessing the digital library for legislative collection in Thailand, called LIRT-Legislative Institutional Repository of Thailand. It is provide access to millions of digital items, including legislative documents and related e-books, journals, newspapers, for nationwide access.

From mobile perspective, a mobile applications need to be developed correctly and effectively cooperate with the DRM and also with the main repository system. The mobile applications need to response to all functions and policy from the DRM server, i.e. document lending policy, dynamic watermarking, expiration policy, save/print policy and most important is the document have to kept encoded at all time in any user devices.

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