e-INDONESIA INITIATIVES Forum 9

PROCEEDINGS

INTERNATIONAL CONFERENCE ON **ICT FOR SMART SOCIETY** 2013

Think Ecosystem Act Convergence

JAKARTA
June 13th and 14th , 2013

HOST:
School of Electrical Engineering and Informatics
Institute of Technology Bandung
e-Indonesia Initiatives Forum

SUPPORTED BY:
Korean Institute of Next Generation Computing
IEEE Indonesia Section

PROCEEDINGS

International Conference on
ICT for Smart Society
2013

"Think Ecosystem Act Convergence"

School of Electrical Engineering and Informatics

Institute of Technology Bandung

Jakarta, 13-14 June, 2013

COPYRIGHT

2013 International Conference on ICT for Smart Society (ICISS)

Additional copies of this publication is available from

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA

+1 845 758 0400
+1 845 758 2633 (FAX)
Email: curran@proceedings.com

PREFACE

Welcome to the International Conference on ICT for Smart Society 2013 (ICISS 2013). The scope of the conference cover concept of smart village, smart city, smart community, smart transportation, smart education, smart health and others that are developed through the use of ICT in order to improve the quality of life both in rural, urban and society generally.

ICISS 2013 is hosted by School of Electrical Engineering and Informatics, Institute of Technology Bandung, and sponsored by e-Indonesia Initiative Forum (eII Forum) and IEEE Indonesia Section. This conference is held in conjuction with the 2013 e-Indonesia Initiative Forum, an annual conference related to national information and communication technology (ICT) policy.

Invited speakers from Universiti Teknikal Malaysia Melaka (UTeM), PT. Telkomsel, School of Architecture, Planning and Policy Development (SAPPK-ITB), Ministry of Communications and Information Technology (KOMINFO – Indonesia) will give lectures on ICT for Smart Society.

Finally, we would like to thank all authors, reviewer, participants, committee members, and sponsors for their supports and participations in the conference. We hope you can enjoy the conference and also the atmosphere of Jakarta.

Prof. Suhono Harso Supangkat
General Chair of the ICISS 2013

ICISS 2013 COMMITEES

General Chairs

1. Suhono Harso Supangkat (Institut Teknologi Bandung)
2. Cheol-Su Lim (Seokyeong University)

Organizing Committee

1. I Gusti Bagus Baskara Nugraha (Institut Teknologi Bandung)
2. Widyawardana Adiprawita (Institut Teknologi Bandung)
3. Byeong-Seok Shin (INHA University)
4. Yun Mook Na (Korean Evaluation Institute of Industrial Technology)
5. John Choi (MarkAny Inc.)

Program Committee

1. Dong Ho Kim (Soongsil University)
2. Sung Wook Baik (Sejong University)
3. Wibowo Hardjawana (Sydney University)
4. Craig Warren Smith (Digital Divide Institute, Center for ethics in Science and Technology, Chulalongkorn University)
5. Fransisco Magno (Lasale University)
6. Richard Randriatoamanana (IRCCyN CNRS France)
7. Chris Jones (Blackberry Academy UK)
8. Hiroyoshi Morita (The University of Electro Communication Tokyo Japan)
9. Datuk Khairuddin (Chairman of The Global Computing Ethics / Vice Chancellor Universiti Malaysia Sarawak)
10. Narayan Kulathuramaiyer (Dean of Faculty of Computer Science and Information Technology)
11. Ahmad Zaki Bin A Bakar (Universiti teknikal Malaysia Melaka (UTeM)
12. Wiseto Agung (PT. Telekomunikasi Indonesia, Tbk)
13. Lukito Edi Nugroho (Universitas Gadjah Mada)
14. Riri Fitri Sari (Universitas Indonesia)
15. Setiyadi Yazid (Universitas Indonesia)
16. Achmad Imam Kistijantoro (Institut Teknologi Bandung)
17. Yudi Gondokaryono (Institut Teknologi Bandung)
18. Armein Z.R. Langi (Institut Teknologi Bandung)
19. Jaka Sembiring (Institut Teknologi Bandung)
20. Yoanes Bandung (Institut Teknologi Bandung)
21. Gati Gayatri (Ministry of Communication and Informatics of Indonesia)
22. Ari Santoso (Institut Teknologi Sepuluh November Surabaya)
23. Hammam Riza (The Agency for The Assessment and Application of Technology – Indonesia)

REVIEWERS

Dongho Kim	Soongsil University, Korea
Hammam Riza	BPPT, Indonesia
Wiseto Agung	PT. Telkom, Indonesia
Ki-Woong Park	Daejeon University, Korea
Sung Wook Baik	Sejong University, Korea
Myungho Lee	Myongji University, Korea
Sanguk Noh	Catholic University of Korea
Seokjoo Shin	Chosun University, Korea
Lynn Choi	Korea University, Korea
Suhyun Kim	Korea Institute of Science and Technology Information
IGB Baskara Nugraha	Institut Teknologi Bandung, Indonesia
Widyawardana Adiprawita	Institut Teknologi Bandung, Indonesia
Yoanes Bandung	Institut Teknologi Bandung, Indonesia
Albarda	Institut Teknologi Bandung, Indonesia
Budiman Dabarsyah	Institut Teknologi Bandung, Indonesia

Table of Contents

IEEE.org | IEEE *Xplore* | IEEE SA | IEEE Spectrum | More Sites

SUBSCRIBE   Cart   Create Account   Personal Sign In

IEEE *Xplore*®

Browse ⌄   My Settings ⌄   Help ⌄   Institutional Sign In

◈IEEE

All ▼   [ ] 🔍

ADVANCED SEARCH

Conferences > International Conference on I... ❓

Mobile learning application based on hybrid mobile application technology running on Android smartphone and Blackberry

Publisher: IEEE   Cite This   📄 PDF

Djoni Haryadi Setiabudi ; Lady Joanne Tjahyana ; Winsen   **All Authors**

3
Paper
Citations

1703
Full
Text Views

Ⓡ   ⌸   ©   📂   🔔

Abstract

Document Sections

I. Introduction

II. Mobile Learning

III. Hybrid Mobile Application Technology

IV. PhoneGap

V. Requirement Analysis

Show Full Outline ▾

Authors

Figures

References

Citations

Keywords

Metrics

Abstract:

Nowadays some universities have been using e-learning in the teaching-learning process. Generally e-learning available in the form of web based application, but does not exist in the form of mobile application yet. Problem that arise when using a mobile device is the screen size is too small, so that the user need to zoom and scroll to get comfortable viewing. Another problem is the user using varying operating system such as android, blackberry and iOS. To overcome those problems, this research is conducted to assist in the teaching-learning process by developing a model of mobile e-learning application that can run on cross-platform, which is on Android and BlackBerry platform. The application is created using PhoneGap that uses HTML5, CSS3, and JavaScript based on Hybrid Mobile Application. The system on the application follows Lentera e-learning system based on Moodle. Lentera is a web based e-learning system used in Petra Charistian University. On the server side, it takes a modified Moodle's source code based on PHP so the application can be run in accordance with the system. The application has a different interface from the website version. The interface is designed to be suitable on smartphone which is has limited screen space. The result shows that the application can run on cross-platform, those are Blackberry and Android smartphone. The application also runs online together with the Lentera website. The basic features of Lentera have been successfully implemented on this application. Assessment of the application as a whole is more than 50% of respondents answered very good.

I. Introduction

Nowadays, many universities have taken advantage of e-learning in the form of a website in the lecturing. Both students and faculties ~~~~~ should find for a computer or laptop. However the physical size of ~~~~~ ke that is such a large and not convenience to carry out.

Sign in to Continue Reading

Authors   ⌄

Figures   ⌄

References   ⌄

Citations   ⌄

Keywords   ⌄

Metrics   ⌄

More Like This

Problems and countermeasures in the use of Computer Aid Instruction in university graphic design teaching

2011 International Conference on Multimedia Technology
Published: 2011

Smart Phone Endowed Intelligent Teaching for University General Education Curriculum in China

2018 IEEE International Conference on Teaching, Assessment, and Learning for Engineering (TALE)
Published: 2018

Show More

Feedback

Bukti terindeks IEEE Explore
https://ieeexplore.ieee.org/xpl/conhome/6578013/proceeding?isnumber=6588046&pageNumber=2

IEEE *Xplore*®   Browse ˅   My Settings ˅   Help ˅   Institutional Sign In   ◈IEEE

All ˅ [   ] 🔍

☐ Search within Publication   ADVANCED SEARCH

Browse Conferences > International Conference on IC... > International Conference on IC...   ❓

International Conference on ICT For Smart Society (ICISS)

🌐 Copy Persistent Link   ▤ Browse Title List   ➕ Sign up for Conference Alerts

| **Proceedings** | All Proceedings | Popular |

International Conference on ICT for Smart Society   DOI: 10.1109/ICISS31551.2013
13-14 June 2013

[Search within results   🔍]   Per Page: 25 ˅ | Export ˅ | Email Selected Results ˅

Showing 26-50 of 75

Refine   ☐ Select All on Page   Sort By: Sequence ˅

Author   ˅   ☐ **Implementation site diversity method on ka-band satellite to reduce**   🔒
                              the impact of rain attenuation in the tropics area
Affiliation   ˅   P Oxy Riza; K. Tanjung; G. Hendrantoro; A. Mauludiyanto
                              Publication Year: 2013 , Page(s): 1 - 6

Quick Links   ▸ Abstract   HTML   📄   ©

Search for Upcoming   ☐ **The design of keyword extraction application as a part of information**   🔒
Conferences   **center**
                              Dina Roslaeni; Albarda
IEEE Publication   Publication Year: 2013 , Page(s): 1 - 5
Recommender
                              ▸ Abstract   HTML   📄   ©
IEEE Author Center
                            ☐ **Designing VoIP security system for organizational network**   🔒
                              Yaqub Hanifan; Yoanes Bandung
                              Publication Year: 2013 , Page(s): 1 - 5
                              Cited by: Papers (4)
Proceedings
                              ▸ Abstract   HTML   📄   ©
The proceedings of this
conference will be available ☐ **Needs analysis in designing information system based on open**   🔒
for purchase through Curran   **lesson for teaching quality improvement of teachers**
Associates.   Muhammad Yusuf Maulana; Yoanes Bandung
                              Publication Year: 2013 , Page(s): 1 - 4
**ICT for Smart Society
(ICISS), 2013 International   ▸ Abstract   HTML   📄   ©
Conference on**
                            ☐ **Optimal path finding based on traffic information extraction from**   🔒 ⌃
Print on Demand **Purchase   Twitter**
at Partner**   Muhammad Hasby; Masayu Leylia Khodra
                              Publication Year: 2013 , Page(s): 1 - 5
                              Cited by: Papers (14)

                              ▸ Abstract   HTML   📄   ©

                            ☐ **MTree: Reliable routing for machine-to-machine systems**   🔒
                              Muhammad Irfan Yousuf; Suhyun Kim
                              Publication Year: 2013 , Page(s): 1 - 7

                              ▸ Abstract   HTML   📄   ©

                            ☐ **Lifelog collaboration framework for healthcare service on Android**   🔒
                              platform
                              Kyuchang Kang; Youngjin Kwon; Youngrae Kim; Jeunwoo Lee; Changseok Bae
                              Publication Year: 2013 , Page(s): 1 - 4
                              Cited by: Papers (2)

                              ▸ Abstract   HTML   📄   ©

                            ☐ **Memory sharing management on virtual private server**   🔒
                              Muh. Niswar; A. Aulia Sabri; Elly Warni; Muh. Nur Musa
                              Publication Year: 2013 , Page(s): 1 - 4
                              Cited by: Papers (1)

                              ▸ Abstract   HTML   📄   ©

                            ☐ **Social media adoption model for smart entrepreneur**   🔒
                              Agastia Cestyakara; Kridanto Surendro
                              Publication Year: 2013 , Page(s): 1 - 7
                              Cited by: Papers (2)

                              ▸ Abstract   HTML   📄   ©

                            ☐ **Mobile learning application based on hybrid mobile application**   🔒
                              technology running on Android smartphone and Blackberry
                              Djoni Haryadi Setiabudi; Lady Joanne Tjahyana; Winsen
                              Publication Year: 2013 , Page(s): 1 - 5
                              Cited by: Papers (3)

                              ▸ Abstract   HTML   📄   ©

                            ☐ **Design monitoring system kWh meter 3 phase using RFID system:**   🔒
                              PT. Multifabrindo Gemilang
                              Suci Rahmatia; Samudra; Boy Iswandi
                              Publication Year: 2013 , Page(s): 1 - 4
                              Cited by: Papers (2)

                              ▸ Abstract   HTML   📄   ©

                            ☐ **Adoption model of hospital information system based on cloud**   🔒
                              computing: Case study on hospitals in Bandung city
                              Toni Kusnandar; Kridanto Surendro
                              Publication Year: 2013 , Page(s): 1 - 6
                              Cited by: Papers (4)

                              ▸ Abstract   HTML   📄   ©

🔍 Author Search   Sources   ?   🏛   Create account   **Sign in**

This author profile is generated by Scopus *Learn more*

Tjahyana, Lady Joanne

ⓘ Universitas Kristen Petra, Surabaya, East Java, Indonesia
ⓘ Connect to ORCID

✏ Edit profile   🔔 Set alert   👥 Potential author matches   ↗ Export to SciVal

---

Metrics overview
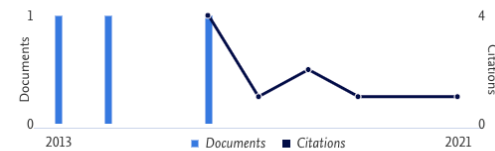
3
Documents by author

9
Citations by **9** documents

1
h-index: View *h*-graph

Document & citation trends

Most contributed Topics 2017–2021 ⓘ

This author has no topics at the moment. To learn why, or more about topics in general. Learn more about Topics ↗

View all Topics

---

3 Documents   Cited by 9 Documents   0 Preprints   2 Co-Authors   0 Topics   0 Awarded Grants ^Beta

Note:
Scopus Preview users can only view an author's last 10 documents, while most other features are disabled. Do you have access through your institution? Check your institution's access to view all documents and features.

Export all   Add all to list

> View list in search results format

> View references

🔔 Set document alert

Sort by Date (newest) ▼

Book Chapter
Android and iOS hybrid applications for Surabaya public transport information
Setiabudi, D.H., Tjahyana, L.J.
Lecture Notes in Electrical Engineering, 2016, 365, pp. 607–617
Show abstract ∨   Related documents

0
Citations

Article
Interactive map routes for public transportation in Surabaya running on smartphones and tablets
Setiabudi, D.H., Tjahyana, L.J.
ARPN Journal of Engineering and Applied Sciences, 2014, 9(10), pp. 1811–1816
Show abstract ∨   Related documents

1
Citations

Conference Paper • *Open access*
Mobile learning application based on hybrid mobile application technology running on Android smartphone and Blackberry
Setiabudi, D.H., Tjahyana, L.J., Winsen
Proceedings - International Conference on ICT for Smart Society 2013: "Think Ecosystem Act Convergence", ICISS 2013, 2013, pp. 147–151, 6588081
Show abstract ∨   Related documents

8
Citations

Back to top

About Scopus

What is Scopus
Content coverage
Scopus blog
Scopus API
Privacy matters

Language

日本語版を表示する
查看简体中文版本
查看繁體中文版本
Просмотр версии на русском языке

Customer Service

Help
Tutorials
Contact us

ELSEVIER

RELX

Mobile Learning Application Based On Hybrid Mobile Application Technology Running On Android Smartphone and Blackberry

Djoni Haryadi Setiabudi, Lady Joanne Tjahyana,Winsen

Informatics Department
Petra Christian University
Surabaya, Indonesia
djonihs@petra.ac.id, joanne@petra.ac.id

Abstract—Nowadays some universities have been using e-learning in the teaching-learning process.Generally e-learning available in the form of web based application, but does not exist in the form of mobile application yet. Problem that arise when using a mobile device is the screen size is too small, so that the user need to zoom and scroll to get comfortable viewing. Another problem is the user using varying operating system such as android, blackberry and iOS. To overcome those problems, this research is conducted to assist in the teaching-learning process by developing a model of mobile e-learning application that can run on cross-platform, which is on Android and BlackBerry platform.

The application is created using PhoneGap that uses HTML5, CSS3, and JavaScript based on Hybrid Mobile Application. The system on the application follows Lentera e-learning system based on Moodle. Lentera is a web based e-learning system used in Petra Charistian University. On the server side, it takes a modified Moodle's source code based on PHP so the application can be run in accordance with the system. The application has a different interface from the website version. The interface is designed to be suitable on smartphone which is has limited screen space.

The result shows that the application can run on cross-platform, those are Blackberry and Android smartphone. The application also runs online together with the Lentera website. The basic features of Lentera have been successfully implemented on this application. Assessment of the application as a whole is more than 50% of respondents answered very good.

Keywords—mobile learning; Hybrid Mobile Application; smart phone; android; blackberry; cross platform; phonegap

I. INTRODUCTION

Nowadays, many universities have taken advantage of e-learning in the form of a website in the lecturing. Both students and faculties who want to access the e-learning should find for a computer or laptop. However the physical size of a computer, laptop, or something like that is such a large and not convenience to carry out.

Considering the condition today, mobile devices have become a way of life for many people. Computers are now replaced by smartphones that can be inserted into a pocket and can be taken anywhere. However, the problem that arise is on a device with a small screen, users need to zoom and scroll to get the comfortable viewing.

According the rapid development of technology, the operating systems for mobile devices are also getting popular such as iOS, Android, Blackberry, WebOS, Symbian, and others. Various operating systems raise the new problem in developing the mobile e-learning (called mobile learning), because of differences in the programming language and the differences in how the operation of each mobile device.

Currently, there is hybrid application technology that can overcome the problem of many different operating systems on mobile phone. This new technology can be used in developing the e-learning mobile phone application. Furthermore, the mobile phone application can be uploaded to the application store, so it can be downloaded by another users. In this research, will be developed a mobile learning application which is a further development of the existing web based applications.

II. MOBILE LEARNING

The term mobile learning (m-learning) refers to the use of mobile and handheld IT devices, such as Personal Digital Assistants (PDAs), mobile telephones, smartphones and tablet PC technologies, in teaching and learning. [5]

As computers and the internet become essential educational tools, the technologies become more portable, affordable, effective and easy to use. This provides many opportunities for widening participation and access to ICT, and in particular the internet. Mobile devices such as phones and PDAs are much more reasonably priced than desktop computers, and therefore represent a less expensive method of accessing the internet. The introduction of tablet PCs now allows mobile internet access with equal, if not more, functionality than desktop computers.

Mobile learning now currently be most useful as a supplement to ICT, web learning and more traditional learning methods, and can do much to enrich the learning experience. In the future mobile learning could be a huge factor in getting unsatisfied people in learning, where more traditional methods have failed. As mobile phones combine PDA functions with cameras, video and MP3 players, and as tablets combine the portability of PDAs with the functionality of desktops, the world of learning becomes more mobile, more flexible and more exciting.

III. Hybrid Mobile Application Technology

Hybrid is derived from heterogeneous sources, or composed of elements of different or unsuitable kinds. A hybrid application is one that is written with the same technology used for websites and mobile web implementations, and that is hosted or runs inside a native container on a mobile device. It is the integration of web technology and native execution. PhoneGap is an example of the most popular container for creating hybrid mobile application[3] [4].

Hybrid application use a web view control (UIWebView on iOS, WebView on Android and others) to present the HTML and JavaScript files in a full-screen format, using the native browser rendering engine. WebKit is the browser rendering engine that is used on iOS, Android, Blackberry and others. That means that the HTML and JavaScript used to construct a hybrid application is rendered/processed by the WebKit rendering engine (for you Windows 8 folks, this is what the IE10 engine does for Metro style applications that use WinJS) and displayed to the user in a full-screen web view control, not in a browser. No longer are you constrained to using HTML and JavaScript for only in-browser implementations on mobile devices.

Mobile SDK supports building three types of applications :

- Native applications are built for a specific platform with the platform SDK, tools and languages, typically provided by the platform vendor (e.g. xCode /Objective-C for iOS, Java for Android, Visual Studio/C# for Windows Phone).
- Mobile Web applications are server-side applications, built with any server-side technology (PHP, Node.js, ASP.NET) that render HTML that has been styled so that it renders well on a device form factor.
- Hybrid applications, like native applications, run on the device, and are written with web technologies (HTML5, CSS and JavaScript). Hybrid applications run inside a native container, and leverage the device's browser engine to render the HTML and process the JavaScript locally. A web-to-native abstraction layer enables access to device capabilities that are not accessible in Mobile Web applications, such as the camera and local storage.

A graph that highlights the differences in native, hybrid and mobile web applications can be seen in Figure 1.

The hybrid applications is the implementation of an abstraction layer that exposes the device capabilities (native APIs) to the hybrid application as a JavaScript API. This is not possible with Mobile Web implementations because of the security boundary between the browser and the device APIs. PhoneGap is an example of a JavaScript abstraction layer over native APIs. Through this abstraction layer a common set of APIs is exposed in JavaScript, and these JavaScript APIs work on any device supported by the framework.
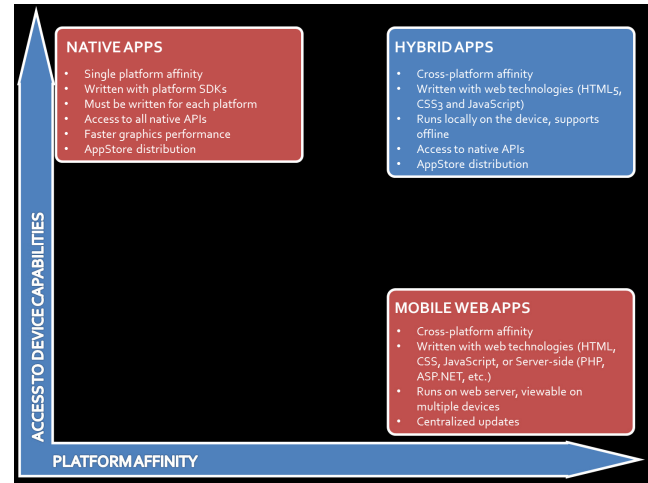

Fig. 1. Three Types of Applications [4]

IV. PhoneGap

PhoneGap is an open source framework to create native mobile applications using HTML, CSS, and JavaScript [1]. PhoneGap can be used for iPhone, Android, BlackBerry, Palm webOS, and Symbian WRT (Nokia). To use PhoneGap, a developer also needs to learn how to use the device Standard Development Kit and its tools. The advantage of using PhoneGap is a mobile web developer can put the application and make it a native application that can be installed (or purchased) by the end user.

As a native application, PhoneGap can access certain capabilities that are not found in web applications, such as access to contacts, geolocation, camera, and accelerometer. The ability to use the PhoneGap JavaScript APIs from PhoneGap. To create a native application using PhoneGap, developers get started with writing a mobile web application using HTML, CSS, and JavaScript. According Firtman (2012), PhoneGap is not a browser, but a framework that can create hybrid applications. PhoneGap is a framework that uses native browser engine. In other words, PhoneGap is a native application with a web application in it.

V. Requirement Analysis

To get the user requirements, this research managed as many as 80 respondents students of Petra Christian University from Informatics Department. A total of 3 student respondents do not have a smartphone and 77 other student respondents have a smartphone. Of the 77 respondents, the Blackberry operating system is the most widely used on smartphones student respondents. Table I shows the variation of student respondents smartphone operating system.

Based on the results of the questionnaire, the reason to open the e-learning is to download the course material. This is the most widely chosen feature of the respondents, there are as many as 80 respondents. Table II shows the reasons to open the e-learning.

TABLE I. VARIOUS SMARTPHONE OPERATING SYSTEMS BEING USED BY STUDENTS

Operating Systems		Quantity	Total
Name	Version		
Blackberry	(n/a)	11	48
	5	13	
	6	19	
	7	5	
Android	(n/a)	3	19
	2.2	3	
	2.3	11	
	2.4	1	
	3.2	1	
iOS	4	2	7
	5	5	
Others	-	3	3

TABLE II. THE REASONS TO OPEN THE E-LEARNING

Reason	Total
Download of course material	80
Upload of assignment	64
News	32
View the Grade	32
Forum	25
Message	11
Chatting	4
Kalendar	18
Others	1

Among additional features desired by the respondents, file sharing or storage is the most preferred, as many as 43 respondents. Table III shows the additional features selected by the respondents.

TABLE III. ADDITIONAL FEATURES SELECTED BY RESPONDENTS

Features	Total
File sharing/storage	43
Notification	40
Schedule	30
Posting ke Facebook	26
Group discussion	20
Calendar	13
Contact	9
Camera	6
Geo location	6
Accelerator	5
Favourite link	4
Kompas	2
Game	1

From the results of questionnaires and interviews, can be found the needs of the new system. Summary of the requirements are:

a. Operating system for Android applications is version 2.3 and the Blackberry version 6. It is based on the number of the most widely used smartphone respondents. In addition to the BlackBerry version 6 there are more features that can support the implementation of the new system compared to the BlackBerry version 5.
b. Users with the role as "student" does not need to register themselves (Enrol) on a course. In addition, users with the role as "teacher" does not need to add a course. This is due to the synchronization process is executed by the system everyday.
c. Users with the role as "teacher" can manage the course is taught, such as changing the course settings and manage the sections contained in the weekly course outline.

As a summary, the features contained in this application are:
a. Assignment tasks by the user with the role as "teacher" and a submitting assigments by the user with the role as "student".
b. Chat which facilitates to make the conversations between users.
c. The discussion forum facilitates to discuss matters relating to a subject.
d. Message which facilitates to send private messages to other users.
e. Resource which facilitates to explore the lecture material.

VI. CONCEPTUAL DESIGN

The mobile learning application are not acessed using a web browser, but by running the application that have been installed on the smartphone. Firstly, the application running on smartphones make a data request to the server. Then the data sent from the server to the application on the smartphone. Comparison between the web based with the mobile application can be seen in Table IV.

TABLE IV. COMPARISON OF WEB BASED AND MOBILE APPLICATION

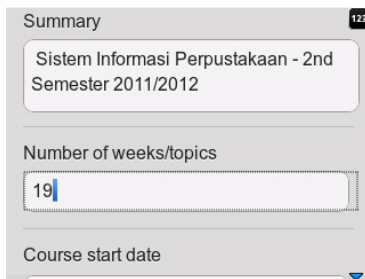| Web based	Mobile Application
Administrator can change the theme on the website	Interface modified as needed and can not be customized
Users can upload files stored on the computer	Users can upload files in the root folder only on the smartphone
The files are uploaded to the server can be stored on the folder chosen by the user	The files are uploaded to the server can only be stored in the root folder
Users can only see the personal message that has not been read	Users can see all the private messages received

This implementation is done at the server and smartphone. Implementation on the server using the PHP programming language, while the implementation of the smartphone using PhoneGap [1] and jQuery Mobile framework programming language [2] that uses HTML 5 [7], CSS 3 and JavaScript [6]. Tests performed on the BlackBerry Curve 3G smartphone running BlackBerry OS version 6 and Samsung Galaxy Pocket that uses the Android operating system version 2.3.6. Testing was conducted on the test menu application, case studies, and questionnaires.

Implementation of programs on smartphones is done by running the installer file. Application can be used after the installation is complete. On smartphones with Android operating system, the user can select a file with the installer file format. Apk, whereas the BlackBerry smartphone using the file format. Cod and. Jad.
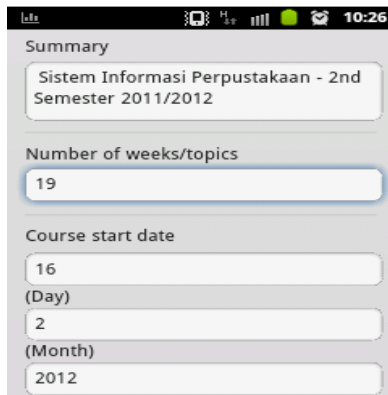
Course used for testing is "Library Information System - 2/2011". This course is a course in Informatics Department which held in the second semester of academic year 2011/2012. This course consists of a general section 1 until section 18 weekly and is taught by one lecturer.

Testing is done by adding a section to the 19th section. After that, the section is filled with modules such as forums, assignments, and so on. Figure 2 shows a form of edit course on the BlackBerry is used to add a the 19th section. Figure 3 shows a form edit course on Android. Figure 4 shows the display of section 19th on BlackBerry just added, while Figure 5 shows the display section 19th on Android.

Fig. 2. Form Edit Course on BlackBerry

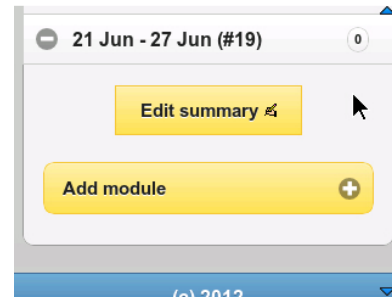Fig. 3. Form Edit Course on Android

Fig. 4. Display Section 19 on BlackBerry

Display section 19th after adding the modules can be seen in Figure 6 for BlackBerry, and Figure 7 for Android. Figure 8 shows the view of section 19th on the Lentera website as a comparison.
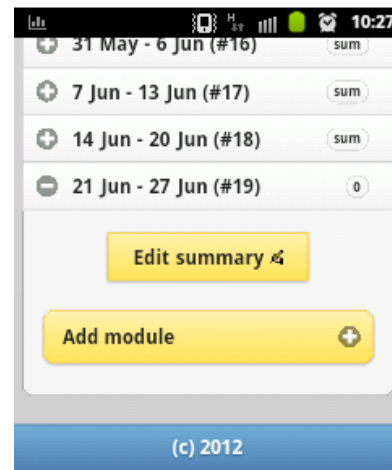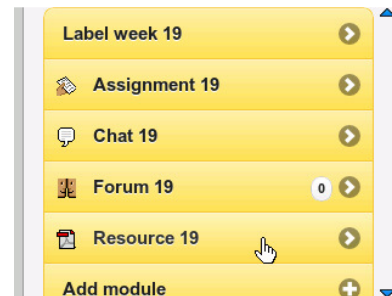

Fig. 5. Display Section 19 on Android

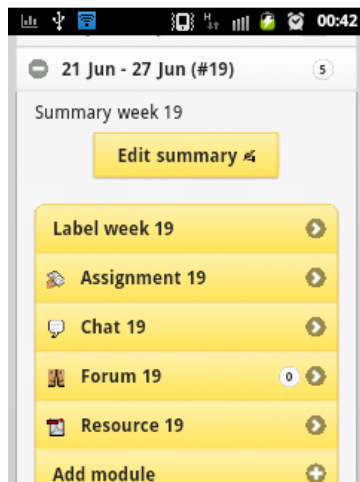Fig. 6. New Display Section 19 on BlackBerry
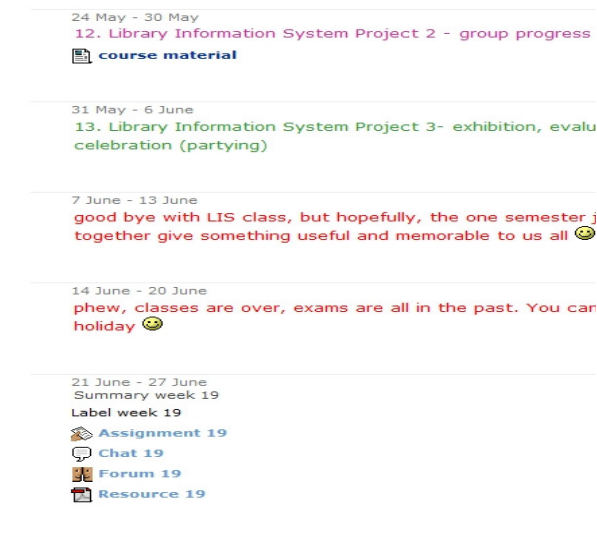
Fig. 7. New Display Section 19 on Android

Fig. 8. New Display Section 19 on Web Based Browser

VIII. CONCLUSION

- Applications can run on cross platforms (Android dan Blackberry) using the same source code.
- Basic features contained in web version "Lentera" has been successfully implemented on this application. Such features include file download course material, assignments, chat, forums, notification, send messages and file upload feature.
- The features in the application can be used in the learning process. It is known from the results of questionnaires, as many as 66.67% of respondents answered very helpful and 33.33% of respondents answer helpful.
- The process to produce a file that can be installed on a platform having different levels of ease. Registration required on the BlackBerry platform and the installation of

on application signing keys, while on Android platform does not require it.
- Not all code HTML, CSS and JavaScript are supported by a platform. In addition, the platform also has a new code that can be used to support such platforms like on BlackBerry platform

REFERENCES

[1] Allen, S., Groupera, V. & Lundrigan, L. Pro smartphone cross-platform development: iPhone, blackberry, windows mobile and android development and distribution. United States of America: Apress, 2010

[2] Firtman, M. jQuery mobile: up and running. United States of America: O'Reilly, 2012.

[3] Korf M. and Oksma E. Native, HTML5, or Hybrid: Understanding Your Mobile Application Development Options. Retrieved April 10, 2013. http://wiki.developerforce.com

[4] Seven D., What is a Hybrid Mobile App?, Retrieved April 10, 2013. http://www.icenium.com/

[5] The Excellence Gateway. What is Mobile Learning? Retrieved April 2, 2013. http://archive.excellencegateway.org.uk

[6] W3Schools. (n.d.). *CSS3 introduction*. Retrieved April, 20, 2012. http://www.w3schools.com/html/css3_intro.asp

[7] W3Schools. (n.d.). *HTML5 introduction*. Retrieved January, 16, 2013. http://www.w3schools.com/html/html5_intro.asp