2018 INTERNATIONAL CONFERENCE ON SMART-GREEN TECHNOLOGY IN ELECTRICAL AND INFORMATION SYSTEM (ICSGTEIS)

CONFERENCE PROCEEDING

Smart Green Technology for Sustainable Living

25 - 27 OCTOBER 2018
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Organized By:

DEPARTMENT OF ELECTRICAL ENGINEERING
POSTGRADUATE STUDY IN ELECTRICAL ENGINEERING
FACULTY OF ENGINEERING
UDAYANA UNIVERSITY
WELCOME MESSAGE

As the General Chair of the 2018 International Conference on Smart Green Technology in Electrical and Information Systems (ICSGTEIS), it is my great pleasure to welcome you to the conference held in Kuta Bali of Indonesia. The ICSGTEIS 2018 conference aims to provide a forum for international researchers, experts, and students to share, exchange ideas, innovation, and experience of the research in the field of Smart-Green Technology. The conference provides an opportunity to strengthen collaboration and networking among participants while enjoying a religious atmosphere and traditional culture of Bali.

The ICSGTEIS covers a number of topics organized into tracks such as Energy and Power Engineering, Electronic Devices and Systems, Multimedia Telecommunications, and Software Engineering and Information Systems. All accepted papers are selected through a peer review process. The committee has received 110 submissions, and 43 papers are selected for presentation. In addition to the technical sessions, the conference program also includes plenary lectures and social event.

I would like to take this opportunity to thank the keynote speakers: Professor Jean-Marie BONNIN from Institut Mines Télécom France, Dr Tania Urmee from School of Engineering and Information Technology Murdoch University, Perth, Australia, and Associate Professor Wei-Chung Teng from Department of Computer Science and Information Engineering, National Taiwan University of Science and Technology, Taiwan for sharing their latest research in their respected fields within electrical and information systems.

I would also like to express my appreciation to Professor AAR Sudewi as Rector Udayana University, Professor NG Antara as Vice Rector Udayana University for Academic Affairs, Professor NPG Suardana as Dean Faculty of Engineering, Dr IBG Manuaba as Head of Department of Electrical Engineering, Dr Linawati as Head of Postgraduate Program in Electrical Engineering, Faculty of Engineering, Udayana University who have supported the ICSGTEIS conference this year. I also would like to thank Professor FY Zulkifli as Chair of IEEE Indonesia Section for their continuous support to the conference. Many thanks also go to the Technical Program Committee and the Organizing Committee, Center for Community Based Renewable Energy (CORE) Udayana University, Udayana Center for Learning Innovation in Asia Pacific (UCLEAP), and IEEE Student Branch Udayana University. Last but not least, thanks to all Presenters and Authors who have chosen ICSGTEIS 2018 to publish their research findings which without their participation this conference would not be possible.

I wish you all to have a great time and a successful conference while sampling the hospitality of Bali.

Dr I Nyoman Satya Kumara, MIEEE
General Chair of ICSGTEIS 2018
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Development of SMS Sending Software for Balinese Script Text on Android Platform

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Abstract— Balinese script has different writing technique compared to writing in Indonesian language. Balinese language can be written using Latin script and Balinese script. Balinese writing is closely related to Balinese script writing (pasang aksara Bali), in which frequently used in writing on palm leaves, wariga, pipil and others. Listing in Unicode standard allows the storing of Balinese script text into data base, Internet network, and many other benefits such as utilization in mobile software technology. This research tries to develop SMS software which is able to send Balinese script data text. This software is in the form of Latin text input which being translated into Balinese script and then sent using 16-bit SMS standard. Test result by using white box method shows that SMS sending process with Balinese script text has given valid result up to 100%.

Keywords— Android, Balinese Script, SMS

I. INTRODUCTION

Writing in each region in Indonesia has various form of letters and has its own uniqueness. One of it is Balinese writing or script. Balinese writing has different writing technique compared to writing in Indonesian language. Balinese language can be written using Latin writing and Balinese writing. Balinese writing is closely related to Balinese script writing, in which frequently used in writing on palm leaves, wariga, pipil and others. Meanwhile Latin writing is frequently used in writing a speech, poetry, play script, student’s books and others [11].

Effort to utilize computerization has been done before on computer namely by performing character codification (character set) that has been approved by Unicode consortium and has been included in International Unicode standard (ISO/IEC 10646). Character codification will allow operational of various text processing function such as: searching, sorting, word calculation, and so on. Listing in Unicode standard allows the storing of Balinese script text into data base, Internet network, and many other benefits such as utilization on mobile software technology.

Balinese script has different characteristic compared to other text scripts, in which the shape of letters are different from the letters in general and having certain rules in writing procedure which often called pasang pageh of Balinese script. The research which had been conducted on mobile device was a software using AR (Augmented Reality) method. Meanwhile images containing Balinese script would be scanned through software and later was processed and translated into Latin alphabets [3].

Research regarding implementation of Balinese script text translation on mobile software mainly on Android platform has not been conducted yet. Based on those problems, this research tries to develop SMS software which able to send Balinese script text data.

II. METHOD

In this research the author conducted a study regarding design of SMS sending software for Balinese script text on Android platform. This research was started from data collection stage and references were obtained from sources such as books, journals, and other sources related to research object about Balinese script. On system design stage, it performed a modeling of software design of Balinese script SMS message. Meanwhile on implementation and testing stage, it conducted the writing of program code and all at once it conducted system testing with white box method. From implementation and testing it acquired a result in the form of SMS sending software of Balinese script on Android platform.

General description of design of SMS sending software for Balinese script on Android platform can be seen in Figure 1 and 2:

![Fig. 1. SMS Sending Process](image-url)

On SMS sending process of Balinese script text consists of several steps, started with typing Latin text on display. Latin text being typed later is translated into Balinese script text. The result of text translation later is displayed in the monitor. Next, the result of text translation is send through SMS. Meanwhile for text translation process into Balinese script can be seen in the figure below.
On text translation process there are several steps started with Latin text input on keyboard. After Latin text is inserted, further the text is changed into Bali Simbar format with a rule. Next, from the result of change leads to a text with Bali Simbar format which is displayed into the monitor, that can be seen on Figure 2.

III. RESULT AND DISCUSSION

A. SMS Sending of Balinese Script Text

Text input on SMS software with Balinese script is in the form of Latin text which being translated into Balinese script. First the user should type Latin text in smartphone keypad. The result of Latin text typing later is translated into Balinese script text which is being displayed into smartphone display. Next, translation result of Balinese script text is send using SMS software which is built using 16-bit SMS standard. Interface for typing and SMS sending of Balinese script on display can be seen on Figure 3.

B. Text Translation of Balinese script

In translation of Latin text to Balinese script, it performs several steps which in outline can be more clearly seen in the following pseudocode below:

1. Start
2. X = Input: Teks Latin
3. Function: Replace ([HTML attr Element], ")
4. Function: Replace ([HTML DOM], ")
5. While (!X.EoL)
6. Replace('(/\$-\/:\-\?\{\-\~\^\_\`\[\]\])/g
7. Endwhile
8. Function: Transalate(X) {
   a. Function: Replace([vocal],[Aksara Suara]);
   b. Function: Replace([vocal],[Pengange Suara]);
   c. Function: Replace([consonant],[Aksara Wiyanjana]);
   d. Function: Replace([consonant],[Aksara Modre]);
   e. Function: Replace([number],[Numbers Aksara]);
   f. Function: Replace([double consonant]) if (X.current) != 'ng' and != 'ny'
   Replace([double consonant],[Aksara Gantungan])
   Else
   Function: Replace([triple consonant],[Aksara Gantungan])
   endif
   g. if (X.translated)
   return true;
   else
   return Translate(X);
   endif
9. TheBalineseText = X;
11. Finish.
C. System Testing

System testing being performed in this research is with white box method to find out success level of the system towards its function. System was tested based on the running logic, both in the form of condition or iteration. White box testing was conducted on the process of typing/SMS sending, text translation into Balinese script, and SMS receiving. Meanwhile the result of white box testing based on path in this research can be seen on the table and figure as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Process/Function Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>User inserts SMS destination no.</td>
</tr>
<tr>
<td>2</td>
<td>User types SMS text in Latin text on keypad</td>
</tr>
<tr>
<td>3</td>
<td>System displays Balinese script text on monitor</td>
</tr>
<tr>
<td>4</td>
<td>User presses send key</td>
</tr>
<tr>
<td>5</td>
<td>System successfully sends SMS</td>
</tr>
<tr>
<td>6</td>
<td>System fails to send SMS</td>
</tr>
<tr>
<td>7</td>
<td>Finish</td>
</tr>
</tbody>
</table>

On Table I is a flow-graph from SMS sending process of Balinese script. From that flow-graph can be drawn into edge and node matching with the sequence of the process which can be seen on figure 6 below:

![Flow-graph of SMS sending process](image)

Fig. 6. Edge and Node in the SMS sending process of Balinese script

After the forming of edge and node like in figure 6, the next step is to determine the path that is: 1-2-3-4-5-7 and 1-2-3-4-6-7. From both paths which have been formed, it will be tested according to system condition which can be seen on table 3.2 as follows:

<table>
<thead>
<tr>
<th>Path</th>
<th>Expected Output</th>
<th>Result Output</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Message successfully send</td>
<td>Message successfully send</td>
<td>Valid 100%</td>
</tr>
<tr>
<td>2</td>
<td>Message failed to send</td>
<td>Message successfully send</td>
<td>Valid 100%</td>
</tr>
</tbody>
</table>

From the test result on Table II can be seen that on SMS sending process of Balinese script has given valid result up to 100%.

IV. Conclusion

This research produces software which is able to send SMS in Balinese script on the Android platform. Test result by using white box method shows that SMS sending process with Balinese script text has given valid result up to 100%.

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