Adaptive Pocket SCORM Reader

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Abstract

Pocket devices are dominated in size which makes them the perfect platform for mobile learning. There are several researches proposed how distance education can be realized on pocket devices. In this paper, we demonstrate the implementation of the Adaptive Pocket SCORM Reader. Our proposed Pocket SCORM Reader is able to load SCORM compatible courseware. Furthermore, we introduce our ideal Pocket SCORM architecture. By the proposed architecture, we hope to realize SCORM compliant mobile learning.

Keywords: *Pocket PC, PDA, SCORM, Distance Education*

1. Introduction

Pocket devices are usually carried around due to the its small size and light weight. As a result, pocket devices are very suitable for mobile or distance education. Although Pocket devices have been improved in both computing power and memory storage recently, they are still with lots of limitation compared with laptop or desktop computers. Therefore, the platform running on laptop or desktop computers can't be directly transferred into Pocket PC devices. The courseware which is designed for laptop or desktop computers should be modified in some ways in order to be suitable for Pocket devices.

In this paper, we demonstrate the implementation of Adaptive Pocket SCORM Reader. Our proposed reader is part of our Pocket SCORM architecture. It is capable to load SCORM compatible courseware, and adjust the course content to adapt to the features of a pocket device.

2. Related Works

Distance education enables E-Learners to learn without the restrictions of both time and space. SCORM (Sharable Content Object Reference Model) is a standard which is proposed by ADL (Advanced Distributed Learning) [1].

Portability of the PDAs was welcomed by students, and limitations such as the small screen size, navigation difficulties, and slow and error-prone methods for entering text, made it difficult to read and interact with document on the PDA [2]. There were some PDA Projects at Virginia Commonwealth University being introduced in [3].

3. Pocket SCORM Architecture

In this section, we introduce our Pocket SCORM Architecture. We pointed out two types of connection for a Pocket PC to connect with LMS Server. One type is Pocket PC is directly connected to the server through wired or wireless network to the internet while the other is Pocket PC connects to the server via PC to the internet while Pocket PC is synchronizing with the PC.

3.1 Pocket SCORM Run-Time Environment

There are six major components which the Pocket SCORM RTE is consisted. They are listed as below:

- *Communication Agent*
  The Communication Agent is the bridge between Pocket SCORM RTE and SCORM LMS server.
  Data Packing Agent
  Before the data is sent to Communication Agent, it should be handled by Data Packet Agent.
- *Data Unpacking Agent*
  The data might be compressed or packed during transmission. Data Unpacking Agent unpack the data to its origin.
- *Learning Agent*
  Learning Agent records learner's learning behavior.
- *SCORM PDA Reader*
  This adaptive reader is capable to load SCORM compliant courseware for learners to read.
- *SCORM PDA Database*
  It's a temporary data store for Pocket SCORM RTE.

3.2SCORM LMS Server

There are two major components involved in SCORM LMS Server.:

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- *SCORM Data Repository*
  SCORM compliant courseware is saved in this data repository.
- *Pocket SCORM Service APIs*
  Pocket SCORM Service APIs are designed for Pocket SCORM RTE. These APIs enable Pocket SCORM RTE to acquire the services from LMS server.

The relationship between each component is shown as figure 3.1.

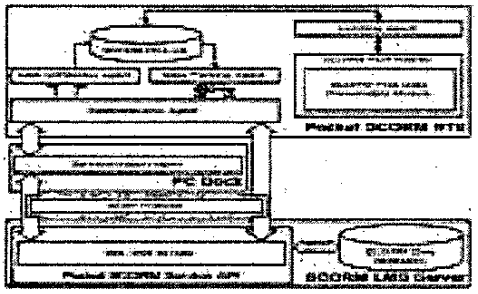

Figure 3.1: Relationship of Components within Pocket SCORM Architecture

4. Adaptive Pocket SCORM Reader

In this section, we demonstrate the implementation of our Adaptive Pocket SCORM Reader by introducing some of the interfaces of our Adaptive Pocket SCORM Reader.

Our Adaptive Pocket SCORM Reader is able to load SCORM compatible courseware. There are two display mode provided by our proposed reader. As shown in the left hand side of figure 4.2, the Normal mode display the course content according to its original design. The original design of the course content is too

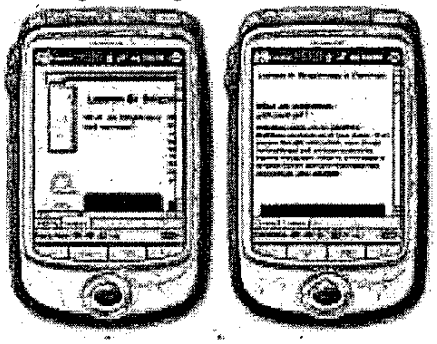

Figure4.2: Display Mode

large to fit in the small display. As a result, learners might feel inconvenient during browsing the courseware because it requires learners operate two scroll bars in order to view the whole page content. Alternatively, our reader provide another display mode which is called MINE mode. By using MINE mode to display the course content, the layout of the course content will be reflowed to fit in the display width of the reader. MINE mode enable learners to use only one hand to operate their pocket device and view the whole page content.

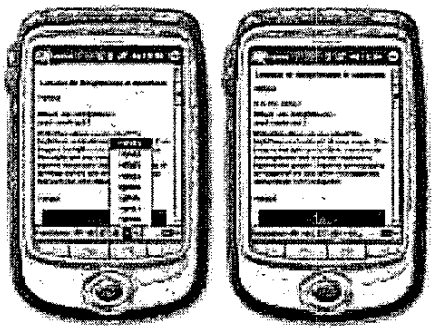

Figure 4.3: Write personal notes down

Another major feature of our Adaptive Pocket SCORM Reader is a learner is allowed to make notes while he or she is reading the learning material. The explanatory notes then will be saved. As shown in figure 4.3, these notes written by the learner will be recorded in during MINE display mode.

5. Conclusion and Future Works

The whole Pocket SCORM architecture has not yet completed. The future works include completing the PC Dock and SCORM LMS Server which supports Pocket SCORM Service API. We also hope that we could conduct some real-world experiment by asking students to participate a SCORM based course by using our system under Pocket SCORM Architecture.

6. References

[1] Advanced Distributed Learning (ADL) (2003), http://www.adlnet.org.

[2] J. Waycott, and A. Kukulska-Hulme (2003), "Students' experiences with PDAs for reading course materials" Personal and Ubiquitous Computing Volume 7, Issue 1 (May 2003), ISSN:1617-4909

[3] Kay Sommers, Jane Hesler, and Jim Bostick (2001), "Little Guys Make a Big Splash: PDA Projects at Virginia Commonwealth University", Proceedings of the 29th annual ACM SIGUCCS conference on User services (SIGUCCS' 01)