

# Development of an HTML5 Presentation Software with Camera and Web Sharing Functions

Hidekazu KAMINISHI<sup>a\*</sup>, Nobuhiro SAKATA<sup>a</sup> & Masao MUROTA<sup>b</sup>

<sup>a</sup>*Division of Information Literacy Education, Dokkyo Medical University, Japan*

<sup>b</sup>*Department of Human System Science, Graduate school of Decision Science and Technology, Tokyo Institute of Technology, Japan*

\*hidekazu@dokkyomed.ac.jp

**Abstract:** We developed an HTML5 presentation software with camera and sharing functions. This software is based on W3C HTML Slidy. To implement these functions, this software uses the APIs of “media capture and streams”, which enable it to handle the camera hardware in the HTML document. Users are able to capture snapshots and then add a slide alongside the picture. The user is also able to add some comments in the slide. The edited slides can be uploaded to a web server and be accessed on the web.

**Keywords:** Presentation Software, Mobile Device, Camera in Lecture, HTML5

## 1. Introduction

### 1.1 Background

In the field of education, many kinds of presentation software and devices have been used and developed. For example, CodEx (Kaminishi and Murota, 2011) has been used for teaching programming lectures.

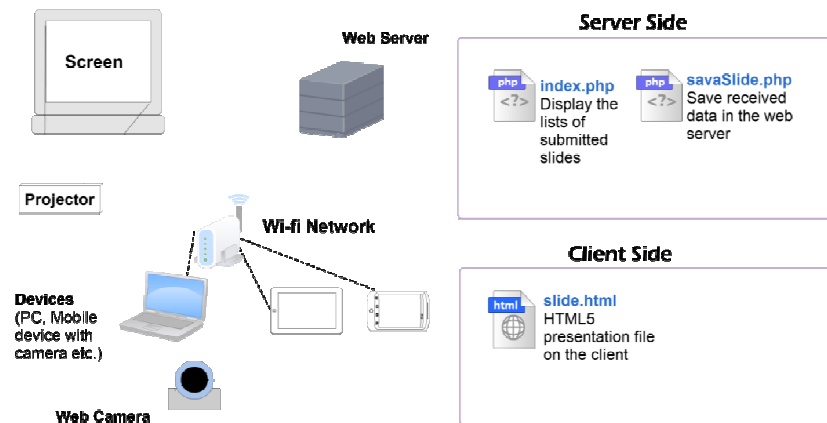
In order to make a lecture more interactive and effective, Kikan-Shido (Between Desks Instruction) is very important (Clarke, 2004). However, when a teacher uses PowerPoint software, the teacher tends to stay in front of the computer where the presentation software is running. This is not preferable for both the teacher and students. Ueda and Murota(2012) developed a software tool (Remote Presentation Controller, RPC) to support PowerPoint presentations with Android mobile devices. The software enables teachers to control the presentation from a mobile device. In addition, the teacher can also take a picture and insert it on a new slide. This function benefits the teacher, as it lets the teacher show students’ works as they make it. It is considered to be important to share their own answers and know various and sometimes exemplary answers by student.

However, RPC is not designed for students’ use. It is considered to be beneficial in showing and sharing their work in cooperative learning situations with many kinds of devices, such as Desktop PC, Tablet PC and other mobile devices.

### 1.2 Purpose of This Study

The purpose of this study is to develop presentation software which has functions for both students and teachers; taking a pictures, incorporating pictures into slides, and sharing

these presentations on the web. Especially, to be available in various kind of devices, the software is implemented by using HTML5 technology.



**Figure 1. Overview of the system**

## 2. Development

### 2.1 Overview

This presentation software is based on W3C HTML Slidy (Ragett, 2005). When a user presents, the user downloads the presentation file from a web server. The presentation file cannot be edited by the presenter. In this research, we added functions for editing and uploading to the web server.

For editing, we added functions to insert new slides to the presentation, to add pictures taken with a camera to slides, and to write simple comments. The edited slides can be uploaded to the server and can be accessed from the web.

An overview of the system is shown in Figure 1. Devices such as a PC or tablet can show the presentation slide. This slide can be downloaded from the web server. The user can see the real-time feed from the camera and can also take a snapshot. If the user does so, a new slide with the snapshot will be inserted. Users (teachers or students) can submit a slide file, which is edited during the lecture. This function is not implemented in the original version of Slidy. Some of these functions are available using HTML5 technology, especially the handling of the camera on the HTML document.

### 2.2 Implementation of the camera/picture function

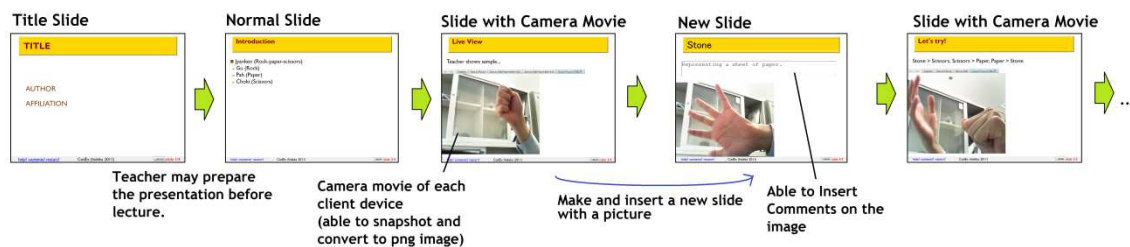
To use the camera and picture function, we adopt video element and canvas element in HTML5. We also use the “getUserMedia()” method in JavaScript. This method is one of the APIs of “media capture and streams”, which allow local media, including audio and video, to be requested from a platform (Burnett and Narayanan, 2012). With these APIs, the HTML slide can capture the camera stream, get snapshots for the canvas element and make a PNG image file.

Though these APIs are in draft form and therefore only the newest browsers support them, it is expected to be useable in various browsers and devices in the near future. At the present moment, we verified that this software runs on Opera 12 (both desktop and mobile) and Firefox 17 (only desktop).

### 2.3 Functions of the slide

The sequence of the presentation slides are shown in Figure 2. This presentation includes title slide, normal slide (without camera function), and some slides with camera movie. Teacher may prepare the presentation slides before the lecture. On the slide with the camera movie, the stream of the camera which is connected to the client device is displayed. Users can capture snapshots of the movie and convert it to the image files or new slides with editable comment. If the user captures a screenshot, the picture will be saved in a permanent image file, but the user can discard it and re-set the camera movie.

Users can save the edited slides by submitting to the web server. The submitted presentation will be accessed on the web and referred to by any other users who are permitted to access the server.



**Figure 2. The sequence of the presentation slides. The fourth slide is added by user.**

### 3. Expected usage in education

We expect this software to be usable in these situations (but not limited to these cases):

- To share students' various answers of mathematical problems: It is considered to be important to share their own answers and know various and sometimes exemplary answers by student.
- To show the manipulation in the anatomy training: students can also take a picture of the organs. This is useful in sharing knowledge with colleagues and in reviewing what they did when they studied other courses.
- To share pictures of outside field work: It is easy to know what the other members do in real time during field work because students can make and submit presentations anywhere the wireless network is available. In addition, it is also easy to report in class after it.

### 4. Summary

We developed an HTML5 presentation software with camera and sharing functions. This software is based on W3C HTML Slidy. To implement these functions, this software uses APIs of "media capture and streams", which enable it to handle the camera hardware in the HTML document. Users are able to capture snapshots and then add a slide by the picture and comment in the slide. This software is expected to be used in various educational situations like mathematics, anatomy or fieldwork. In the next study, we plan to use this software in those lectures and evaluate its usability and impact.

## References

- [1] Burnett, D., C. & Narayanan, A. (2012). Media Capture and Streams. *W3C Editor's Draft 25 June 2012*, from <http://dev.w3.org/2011/webRTC/editor/getusermedia.html> (referred on Aug. 8, 2012)
- [2] Clarke, D. J. (2004). Kikan-Shido - Between Desks Instruction. *Annual Meeting of the American Mathematical Research Association*, from [http://extranet.edfac.unimelb.edu.au/DSME/lps/assets/Clarke\\_Kikan-shido.pdf](http://extranet.edfac.unimelb.edu.au/DSME/lps/assets/Clarke_Kikan-shido.pdf) (referred on Aug. 6, 2012)
- [3] Kaminishi, H. & Murota, M. (2011). Development and evaluation of a new presentation software program (CodEx) for teaching programming code. *Research and Practice in Technology Enhanced Learning*, 6(2), 83-106.
- [4] Raggett, D. (2005). HTML Slidy: Slide shows in HTML and XHTML. from <http://www.w3.org/Talks/Tools/Slidy2/> (referred on Aug. 8, 2012)
- [5] Ueda, K., & Murota, M. (2012). Development of software tool to support Powerpoint presentations using Android ,mobile device for teachers. *Proceedings of Ed-Media 2012* (pp.1459-1464). Denver, Colorado.