# Development and Evaluation of Presentation Support Software Using Mobile Device

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**Abstract:** Lectures can be conducted more efficiently by increasing the mobility and user interactivity of teacher-oriented software. We added features to existing PowerPoint remote presentation software, which enable users to prepare beforehand for the next slide by displaying a preview of the next slide at the bottom right of the screen, and insert pictures into the slides using the Android device's local memory. We describe the features and mention the results of an initial questionnaire as a way to validate our objective.

**Keywords:** Android, Mobile Device, Lectures, Interactivity, PowerPoint, Presentation

## Introduction

A presentation is one of the means to communicate one's ideas where there is a potential of bi-directional flow of information between the presenter and the audience. Today, Microsoft PowerPoint is the most popular presentation software in various fields including academia. PowerPoint has many in-built features that greatly enhance its user-interface and help the presenters interact more with the listeners during the presentation. However, there are some features that could enhance the user-experience of the software for better productivity. For instance, the PowerPoint software can be connected to an Android client which, in turn, can use intuitive dynamic user operation modes to send remote control commands by leveraging various features of Android OS. The objective of this research is to improve the effectiveness of existing presentation software by adding features which are aimed at improving the user-interface for the lecturer which eventually leads to effective learning and better interaction between the lecturer and students.

## 1. Related Work

*Presentation Support Software Using Mobile Device For Interactive Lectures* [1]
In this research, a presentation tool with the following features was developed and evaluated. In our previous work [1], we developed a presentation software for mobile devices that supported the following features:

- Drawing annotations on slide
- Refer to slide notes
- Turn over pages from the mobile device
- Refer to thumbnails of the slide

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- Taking pictures and incorporating them into the slide on the spot

Based on the results of a survey [1], three areas for improvement were found in the existing presentation software. In our present research, we focus on the following three new features:

- To be able to display a preview of the next slide
- Use a pointer to emphasize a specific part of the slide
- Upload pictures from the local memory of the mobile device

*1.1 Design of a Smart Remote Controlled Framework based on Android Mobile Devices*

In this research, the Android device acts as the client side of the proposed smart remote controller. The software uses intuitive dynamic user operation modes to send remote control commands to the controlled side by leveraging the multi-touch events, gesture recognition and hand gestures features of the Android device [2].

## 2. Software Description

### *2.1 Architecture*

As described in [1], the software consists of server and client components. The server side is an add-in for PowerPoint 2007 and 2010. It is implemented in C#, and runs on .NET Framework 3.5 or later. The client software runs on mobile devices running Android platform 1.5 or later. They communicate with each other over TCP on a wireless network.

### *2.2 Features*

Out of the three features stated above, two new features (explained below) have been added to the existing software.

#### *2.2.1 Display preview of the next slide*

This feature helps the lecturer to view the preview of the next slide at the bottom right of the screen. It helps him/her to have an idea about the next slide and prepare beforehand accordingly.

#### *2.2.2 Upload picture from the device's memory*

This feature enables the lecturer to upload pictures from the device's memory [3]. Previously, since this feature was absent, lecturers had to directly insert pictures taken with the device's camera. With this feature, they can simply take a picture, store it in the internal memory and use it later during the class to make learning more interactive.

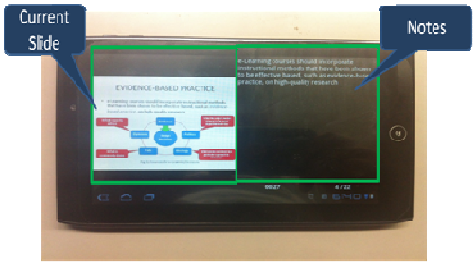


**Figure 1: Without preview**

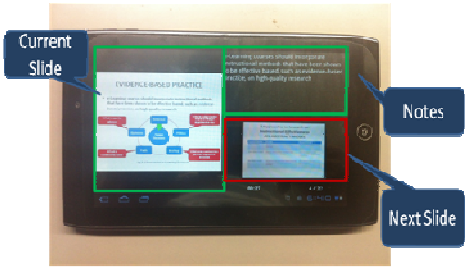


**Figure 2: With preview**

**Figure 3: Uploading an image on-the-spot**

**Figure 4: Uploading pictures from the device's memory**

## 3. Evaluation

10 Graduate students of Tokyo Institute of Technology participated in an evaluation of the new features of the software. The server side consisted of Windows XP with Microsoft PowerPoint 2007. The mobile device used was a Motorola MZ604 model with Android version 3.2. The questions were classified in a Likert scale from 1 to 5, with 5 being 'strongly agree' and 1 being 'strongly disagree'. Features like preview of next slide and incorporating slides directly from the device's memory received good evaluation. However, users found it difficult to understand the objective of a button just by looking at its icon and had to read the accompanying caption until they got used to it. We hope to increase the number of participants to evaluate the software in the near future.

**Table 1: Results of the questionnaire**

| Question | Mean | S.D. |
|---|---|---|
| 1. Did the preview of next slide help you to prepare beforehand? | 4.6 | 0.7 |
| 2. Did you view the notes as intended? | 4.4 | 0.7 |
| 3. Did you find the layout of buttons (icons) appropriate? | 3.8 | 0.9 |
| 4. Did you understand the meaning of button (icons) easily? | 3.3 | 0.6 |
| 5. Did you find the feature of incorporating pictures directly from the device's memory helpful? | 4.3 | 1.1 |
| 6. Did you learn the usage of this software easily? | 3.8 | 0.8 |
| 7. Did you find this software useful? | 4.6 | 0.5 |

## 4. Conclusion

We added news features suggested in the questionnaire of the previous research. The results of the evaluation show that the added features are effective in increasing the functionality of the software. In the future, we intend to add more features such as the pointer feature which will help to emphasize on a specific area of the slide and an

integrated web-browser feature to perform online search during class without having to exit the presentation.

## Acknowledgement

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