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Design of User Feedback Interface for Dynamic Updating of E-Book Content

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Abstract

With the development of IT technology, the book was able to be in a digital device. As interest in electronic books increased, there were various attempts different from existing paper book. However successful e-book service model did not come out y. In addition, the emergence of Web 2.0 maximized the active participation of users. Readers want to actively participate on reading rather than passively reading the books. Also the number of cases that providing the feedback that share one's phrase or a good review with others, have been increased. In this paper, we propose a publishing service that uses users' feedbacks as reader participating e-book content. Existing feedback was in the form of sharing notes and annotations, such as an overall review of the e-book and highlight. However, in this paper, we focus on using user feedback as e-book content by pre-defining feedback at the time of authoring a book. For this purpose, we designed the interface to update e-book content dynamically, considering what to input, how to collect and show output result.

Keywords: *User Feedback, Dynamic changes, E-book, Contents authoring*

1. Introduction

Web 2.0 environment has three characteristics, 'Participation', 'Sharing' and 'Openness'. Without the active participation of users will, as now, numerous web contents would not be created. In addition, it has been generalized that users actively express their thoughts and opinions by sharing them with others, such as forming a community. This change in the web environment started to change the demand for digital publishing.

The readers began to actively participate in reading activities. The readers want to participate and reflect their opinions away from passively watch the book. However, existing e-book is published in PDF or EPUB file format by digitizing a paper or published as an application form. This made it difficult to accept the opinion of the readers, since e-book is published with a fixed content which remains unchanged.

In this paper, we propose a publishing service that gets reader's feedback and uses them as reader participating e-book content. By receiving the feedback from the electronic book, dynamical updating is available to display the result of feedbacks in real time.

However, in order to utilize user feedback to the e-book content, it should reflect the intent of the author, such as where to receive the feedback and what content the feedback should be. Therefore, we propose a feedback interface that the authors insert a pre-defined user feedback form at the time of authoring an e-book. Feedback interface consists of a structured Feedback Components, which has an Input Clue and Output Clue. Input Clue defines the content to be received from the user input. Output Clue defines the output

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form of user feedback. This enables the service that collects user feedbacks and utilizes them to update as e-book content dynamically.

2. Related Works

The feedback is being studied in various areas, such as social reading area to share feedback, crowd sourcing in design area and e-learning area.

Firstly, there are studies being actively conducted to share feedback via annotations in the reading environment. Martín Pérez-Pérez *et al*. [1] have proposed a Marky, web-based document annotation system. Marky offers the authors to define annotation types and guidelines to provide unique means to minimize annotation effort and enforce annotation quality.

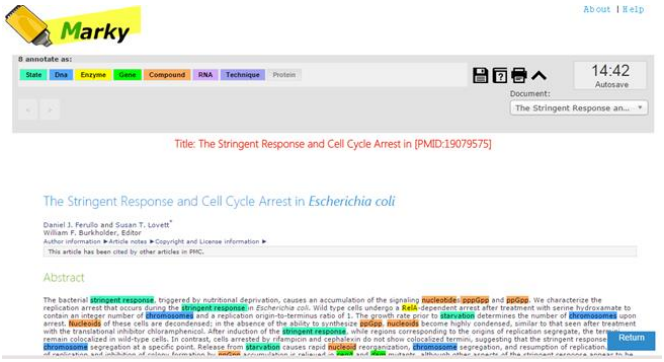

Figure 1. Marky System

Sacha *et al*. [2] proposed NB system, an in-place collaborative document annotation website targeting students reading lecture notes and draw textbooks. The system shows annotations next to the document so the users can share their opinions through the reader. Users can select a specific area in the document and create the feedback, such as indicating importance, asking question and answering to the question.

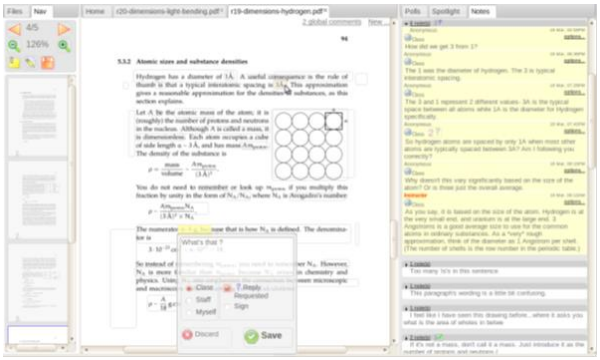

Figure 2. NB System

Eri Kataoka *et al*. [3] have proposed a social reading system based on EPUB3. The system collects and manages reading-related information. The system allows the users to share the reading-related information and extract useful information out of the stored data.

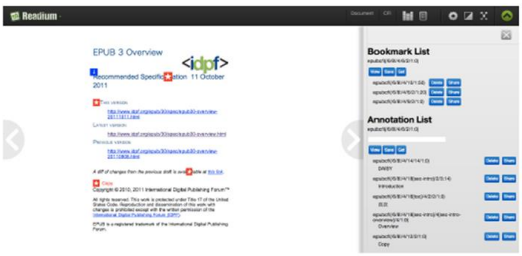

Figure 3. Social Reading System

Secondly, research on crowd sourcing, working together to make one product, are being conducted. Kurt Luther *et al*. [4] have proposed CrowCrit, a web-based system leverages paid crowdsourcing to generate and visualize high-quality visual design critique. The system let non-specialists to participate as critics for improving the design. The designer uploads the design he wants to improve. Then, the critic can choose 70 kinds of pre-selected sentences, made based on the design principles, and select a specific area of the design to criticize. The system aggregates and shows the critiques to the designer to improve his/her designs.

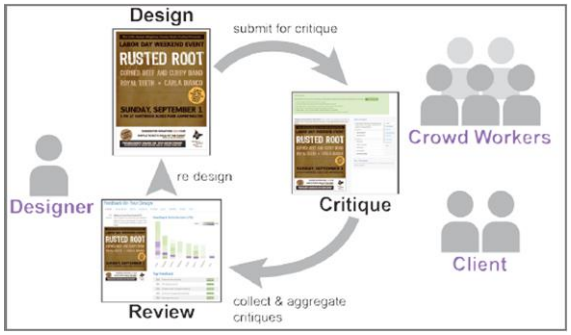

Figure 4. CrowdCrit

Anbang Xu *et al*. [5] proposed the feedback system based on crowd sourcing, called Voyant. The system allows the users to access to non-expert crowd to receive perception-oriented feedback and their designs from a selected audience. The designer uploads the design and non-experts generate a structured feedback by following system workflow, such as the elements seen in the design, the order in which elements are noticed, *etc.* Designers review the feedbacks and make changes on the design.

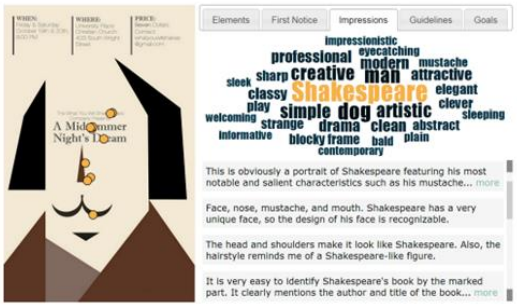

Figure 5. Voyant

Finally, there are studies on feedback in e-learning environment. Elena L. Glassman *et al*. [6] proposed Mudslide, a prototype system that provides a simple interface for enriching online video lectures by providing a way for students to efficiently and

specifically express their confusion to instructors. The teachers create lecture videos and a folder of lecture slide images used in their video. After the lecture, the students see the gallery of thumbnails, the lecture's slides. They select the exact point that is confused and explain the reason why it is unclear. The system aggregates and summarizes all of the students' feedback and let the teachers get the result.

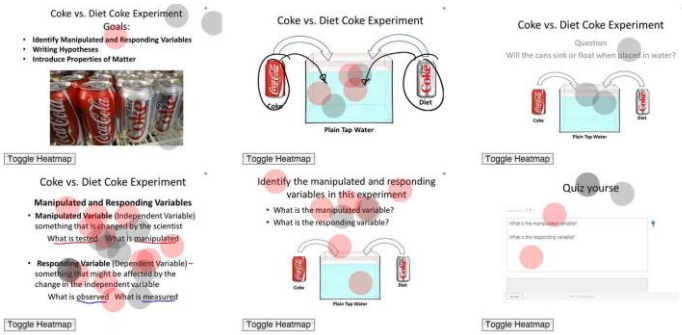

Figure 6. Mudslide

Joung-Souk Sung [7] focused on collaborative learning as an application domain of learning. She described the development of a collaborative learning model that uses mobile environment and the concept of m-learning. She designed modules to support collaborative learning, which the system have a various communication type, a question and an answer, multi-learning session, high degree of efficiency, high degree of cooperative, low degree of periodical cost and time constraint.

Joung-Souk-Sung [8] also proposed the implementation of learning between student and teacher of service provider in u-space. The purpose of the research was for the establishment of U-learning environment based synchronous, asynchronous and hybrid mode.

We have examined the feedback in various fields, which is studied with different purpose. The feedback in social reading, crowd sourcing and e-learning is discussed.

3. Requirement for User Feedback in Digital Publishing Environment

3.1. Dynamic Update for Digital Publishing

The existing forms of electronic publishing are one with e-books published by digitizing paper-based text book images, video, audio, *etc.* and the other, a publishing in a form of application that provides multimedia insertion and limited interaction.

A text-based e-book is a form that scans a paper book and converts into digital form. This is advantageous in providing a high quality of the layout similar to a paper book. However, since the paper was a book simply converted to digital format, it didn't took advantage of the digital device. It provides content that is primarily for simple reading, such as novel.

Multimedia-based e-book utilizes a variety of multimedia such as providing multiple images, video and audio, taking advantage of the digital devices and so on. It also provides simple interactions, such as 'Touch' and 'Drag and Drop', giving fun and interest to users. However, it is disadvantageous that the production costs are high. It primarily provides contents like children's books and magazines.

Figure 7. Types of Digital Publishing Books

Existing E-book has a feature that after being published once, it doesn't change, like a paper book. However, users accustomed to Web 2.0 environment, want to actively participate on the book and want e-book content be dynamically changed. Therefore, new form of electronic publishing service model that the users' e-book content is dynamically updated is needed.

3.2. Types of User Feedback

It is possible for the users to participate in e-book by user feedback. Existing feedbacks from users of e-books were the mainly form of the reviewing and error reporting from users after publication. The purpose was to simply share the opinions, so it was impossible to take advantage of e-books directly to the content.

In this section, the type of user feedback is classified as Survey type, Question and Answer type, Communication type and Collaboration type. We analyzed the requirements to utilize the classified feedbacks directly in an e-book content.

3.2.1. Survey

Survey type is a form of receiving feedback by providing certain format to the user. Survey type has the advantage of being able to obtain a direct answer to the question from the user for the purpose of obtaining a survey or any statistical data. On the one hand, it is disadvantages that there will be a possibility that few users participate in the survey. The survey can be utilized in the form of the assessment and vote in e-books. The author may evaluate specific contents of the book or directly ask the users' opinion through the survey type.

3.2.2. Question and Answer

Question and Answer type is a form of asking questions that has an answer and let the users solve the questions. A typical example can be given as the exercise problem in the learning content. Question and Answer type is a good way to get users' participation, but it is difficult to share readers' opinions. Thus, it is important to select the format to show the users' feedbacks.

3.2.3. Communication

Communication type is a form that users can discuss with other people. For example, users freely exchange comments about the content. It can also be a social media service that is typical service of Web 2.0. Communication type has an advantage, since users are able to communicate with each other, which can be a driving force to actively participate in the e-book content. However, it may be a factor that may interfere with the electronic book content, so it is important to control it.

3.2.4. Collaborative

Collaborative type is a form that users make the e-book content together. This can be a new form of e-book service with communications between authors and readers, or readers and readers. It is important to collaborate with other people because it is difficult to produce content alone where the environment changes rapidly as today. For example, anyone can create, modify or complement, similar to Wikipedia, to form a single content. Also it may create a richer content by presenting information related to the specific content.

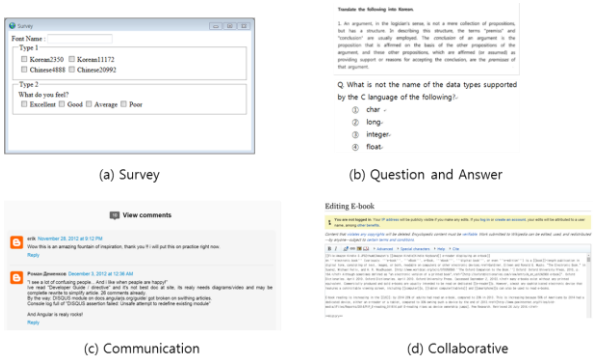

Figure 8. Types of User Feedback

The purpose of this study is to leverage user feedback as readers participating content. By inserting the feedback information of the electronic book in a real-time, it is possible for the service to update the contents dynamically. However, if a user receives feedback as existing free-form type, as open-ended feedback, the problem may occur. First, if the user is free to create the user feedback, the feedback content might not be the intention of the author and also, it can interfere with the content in the book. Second, there may be less the amount of user feedback. Rather, the reader can be less involved because the reader reading a book might not give the feedback. Therefore, in this study, we designed a feedback interface to get user feedback as the resources from the particular area the author wants.

4. Design of Feedback Interface for Dynamic Update

4.1. Structure of Feedback Components

There are two types of clue needed to utilize the user feedback as a resource in the book. One is to define the input format, such as where to get the feedback and what type of feedback is needed. The other is to define the output format, such as how to show the received feedbacks as a content of the book. By pre-setting when authoring the book in this way, the feedback can be reflected in the content.

In this study, we implemented Feedback Interface by configuring the Feedback Components. Feedback Components can determine via the Input Clue and Output Clue about the type of feedback to collect and to apply as a content of the e-book. Input Clue and Output Clue represents the interface through the HTML element. To handle this, there is an implementation of Ajax Feedback processor for storing and gathering user feedback on the server.

Figure 9. Overview of Feedback Interface

4.2. Input Clue

The input element defines the type of the feedback information, receive input from a user. That is, the type of feedback requested to the user which defines the input method and the input information.

Input method determines the input type when getting the feedback from the user, which are in the form of 'Pop up', 'Tab' and 'Involve'. 'Pop up' and 'Tab' is a form suitable for the case of content that can lead to active participation of the users in the e-book. For example, if the book is providing travel information, the book let the users to put the ratings of the hotels. This needs users' voluntary actions to get the feedback, such as ratings. 'Involve' is form that uses the feedback as a direct e-book content. This is the form that created from the authoring the book to increase engagement of all the users to create e-book. The author can choose what is right for the content from one of three types of user feedback input.

The input information defines the feedback form received from users. The authors can select the type of user feedback, such as a survey, problem-solving, discussing and collaborating. To get input information, we used <form> and <input> in HTML to define *data-feedbacktype*, a custom data attribute, for receiving user feedback in the tag value. In addition, the user may send a feedback to the server by calling the Feedback Processor.

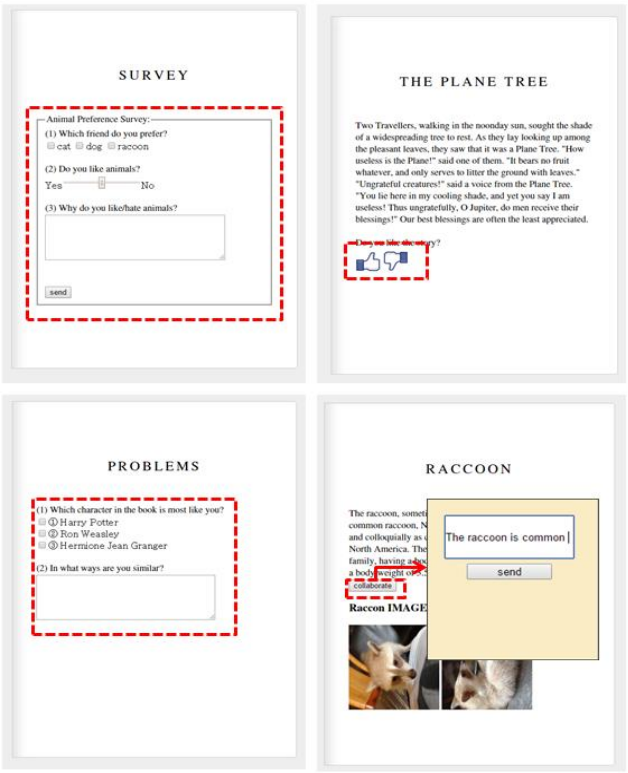

Figure 10. Input for Feedback Interface

4.3. Output Clue

The output element defines the information to indicate how to process with the feedback received from the user input for viewing. This element is intended to control the user feedback with author's intention. In addition, the output element is important because it has to estimate the state to be reflected in advance to automatically show the user feedback.

That is why the output element needs to set the restriction factor to control the contents of the book. Through the restriction factor, author can select the update period, the sorting order, such as chronological order, by popularity and random, and the number of outputs to show. Also it needs information about how to handle the aggregated result. Although there are some cases simply expressing feedbacks, but also there are some cases to show a statistically calculated feedbacks from the user. For example, if the feedback is non-value data, such as the text, few of the text feedbacks can be shown. If the feedback has value, if has to be defined whether to sum the values, calculating the average values or calculating the standard deviation to show the result.

The author must also set the output method for representing the result of user feedback gathered through the Output Clue. Feedback content has to be defined whether to make a fixed area for the content, or to extend the content area when the number of feedback is increased, or to express the bar graph, line graph or chart graph. The output element and restriction factor are sent to the server system via the Feedback processor. The server sends the processed user feedback results and the results are expressed in the book.

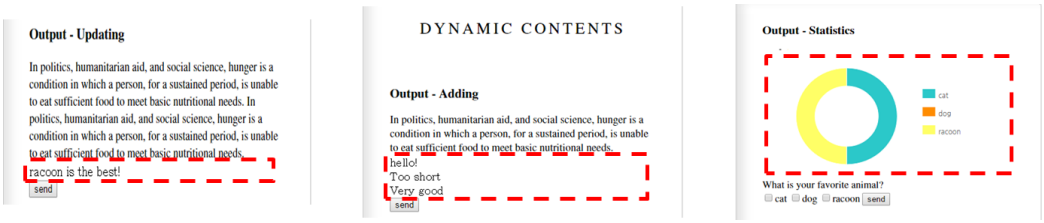

Figure 11. Output for Feedback Interface

5. Conclusion

User feedback is important in that it can accept the opinion from the users. Recently many studies are conducted to identify the trends of the users, because people want to actively express their opinions and want personalized contents. Feedback from existing e-book has been utilized in terms of sharing the comments about the book among the readers. In this paper, we proposed a publishing service to dynamically update the electronic book by utilizing user feedback as an e-book content. To do this, we classified and analyzed the user feedback type into Survey type, Question and Answer type, Communication type and Collaborative type. Based on this, we composed the Feedback Components that can be inserted in a form to get user feedback in a book, and we implemented to represent a feedback interface. We designed to let the author pre-define the type of user feedback at the time of authoring a book as intended to present the feedback result, and the users create feedback while reading the book. Feedback Components is composed of input clue, output clue and has the Feedback Processor for outputting the result of storing and sending a data of the user to the server and receiving the result to present in the book. By proposed Feedback Interface in this paper, it is possible to provide dynamically changing book by using reader's feedback and applying to the book in real time.

Acknowledgments

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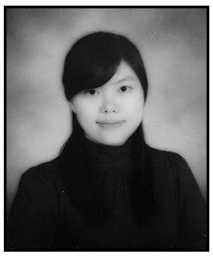
Authors



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