

# A Proposal of Smart TV System focused on Findability

Toru Kobayashi

Division of Electrical Engineering and Computer Science  
Graduate School of Engineering, Nagasaki University  
Nagasaki, Japan  
toru@cis.nagasaki-u.ac.jp

**Abstract**—I propose a Smart TV System focused on findability. This system allows us to retrieve information without typing-in search key words. It also allows us to see retrieved information via multi-screen environment based on the intuitive user interface. I show an information finding model as a fundamental concept of this system, system configuration and user interface. I believe that this system will solve the problem of information retrieval capability differentials among users.

**Keywords**—Smart TV; findability; HTML5; user interface;

## I. INTRODUCTION

The smart TV which enables the harmonization of broadcasting and data communication has become popular. The smart TV has an advanced interactivity. For that reason, the smart TV allows us to do more active information retrieval rather than before. This contributes the realization of the personal information usage environment. On the other hand, this causes the problem of information retrieval capability differentials among users.

Therefore, this paper proposes the smart TV system which solves the problem of information retrieval capability differentials among users, that is, the smart TV system focused on findability. The proposed system contains a tablet PC and several TV monitors. Using this proposed system, hot words are coming up just after executing Web browser of the tablet PC. When users select the one of hot words, the detail information about the hot word, the related shared video or private video/photos taken by users, related tweets, related books or products are displayed on the tablet PC. Users can operate video hosting services or private video/photos on the tablet PC to show them on different TV monitors. Users are also able to buy books or products after checking the precise specification about them on the tablet PC. In this way, the proposed system allows us to retrieve the associated information one after another just pointing the interested hot words.

## II. PROPOSAL

### A. Information Finding Model

Fig.1 shows the proposed information finding model. This model is the hot word oriented one. The user indicated in the center of Fig.1 can see some hot words and select one of them as first contact. Then, the associated information of selected hot

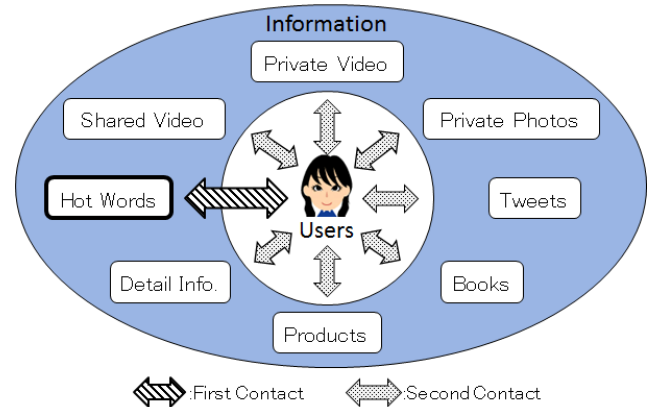


Fig.1. Information Finding Model

words will be informed to the user. The user can choose one of them to check precisely as second contact. In this model, the user does not have to type-in key words to retrieve trendy information in that time. Just seeing and selecting operation is enough to do that.

### B. System Configuration

Fig.2 shows the system configuration. The proposed smart TV system consists of a control server, a tablet PC and TV monitors. The control server not only controls the tablet PC and the TV monitors but also retrieves information from Web services via open API. The gathered information is displayed on the tablet PC or the TV monitors according to the user operation. The process of this proposed system is listed in the bellow.

- The control server gets several hot words from goo[1] which is the portal site in Japan and shows them on the tablet PC.
- When the user selects the one of hot words, the control server starts to retrieve information against Web services such as DBpedia or YouTube. The control server is also going to search private video/photos stored inside.
- The acquired information is informed to the user via the tablet PC.
- The shared or private video/photos can be viewed on the TV monitors according to the user operation.

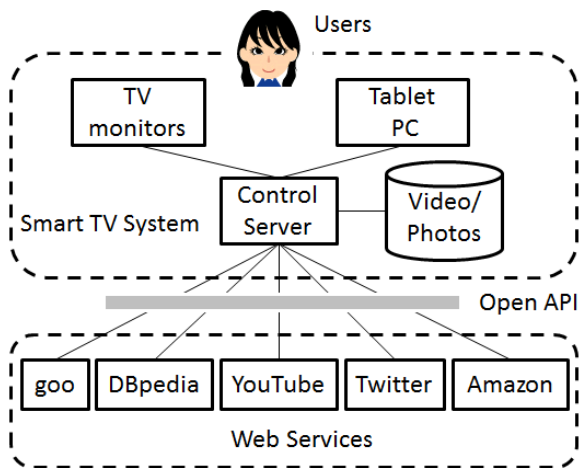


Fig.2. System Configuration

Table 1. System Specification

Control Server	Tablet PC	TV Monitors
Linux CentOS 6.2	iPad mini	Windows PC
Apache 2.2.15, PHP 5.3.3	iOS 6.1.3	Chrome 18.0
WebSocketServer 2.1.0	Safari	

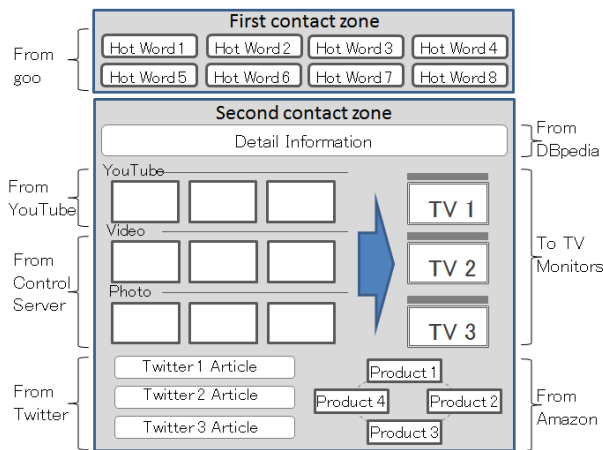


Fig.3. Screen Design for the tablet PC

Table 1 shows the system specification. I used the Windows OS PCs as TV monitors. This system has been implemented using the Web standard technologies like HTML5. For that reason, the tablet PC and the TV monitors have only the Web browser. HTML or JavaScript needed to operate the tablet PC or the TV monitors are stored in the control server. They will be called when needed. WebSocket has been implemented between the control server and the tablet PC, the control server and the TV monitors as well to realize the interactive communication.

### C. User Interface

Fig.3 shows a screen design for the tablet PC. Only hot words are appeared on the first contact zone when the tablet PC browser accesses the control server. When the user selects the one of hot words, the associated information will be displayed

on the second contact zone. The shared video or the private video/photos are shown as thumbnails. When the user drags and drops the one of thumbnails to the TV monitor area at the right hand side, the content corresponding to the dragged thumbnail will be shown on the pointed TV monitor.

The books or the products extracted from amazon are also shown as thumbnails. When the user chooses a thumbnail, he/she can go to the amazon home page to see more detail information about it and also buy it.

### III. RELATED WORK

User interfaces for information browsing have been proposed such as InfoCrystal[2], TileBars[3], and InfoLead[4]. These interfaces represent the relationship among items, but they were designed for active information browsing only. InfoSkin[5] assists the discovery of unexpected information. However, it does not have the capability of multi-screen.

### IV. DISCUSSION

The proposed system has realized the metaphor that is to select and read only interested articles happened to see just opening the newspaper in the morning. In other words, the user can acquire only interested information from the suggested information using the tablet PC and the TV monitors instead of papers. The newspaper is read by all over the world and the problem of information retrieval capability differentials among users has not been occurred. It is the suggestion that the proposed system can solve the problem of information retrieval capability differentials in the smart TV area.

### V. CONCLUSION

In this paper, I proposed the information finding model, system configuration and user interface to solve the problem of information retrieval capability differentials among users in the smart TV area. The feature of this system is that it has the same metaphor of reading newspaper. I will realize the personal Smart TV system enhanced mining results of this system usage history as future work.

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