

## Research on User Customized Social Mobile Platform base on Personalized TV through IP Networks

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### Abstract

*In this paper provides to users who are using the SNS and IPTV platform a customized Social TV. The existing simple feature of security and Social TV, the user's preference by offering a decent TV channels, users would like to help to use the TV. In order to provide a suitable platform for customized Social TV, we use Hadoop MapReduce and by analyzing the words which users were looking for and recommended through the SNS, TV channel to give similar extent, television channels. Compare the information in descending order of priority of the 5 different TV programs. In addition, analyzing of the data is based on users and providing customized TV Schedule. Using smartphone, users can watch TV with the application of information in real time and users might change the order of the TV program channels. We proposed customized Social TV using information of user' SNS.*

**Keywords:** Customized Social TV, SNS, IPTV, MapReduce, TV Platform

### 1. Introduction

Social television is a general term for technology that supports communication and social interaction in either the context of watching television, or related to TV content. It also includes the study of television-related social behavior, devices and networks. Social television systems can for example integrate voice communication, text chat, presence and context awareness. In recent years, the Internet and the rapid emergence of high-performance smart phones, watching way change from watching own TV to watching TV together. People need not to watch TV at home, by using a smart phone, people can watch TV anytime, anywhere. Traditional analog TV changes to broadcasts IPTV [1, 2] for the users who want to watch TV broadcasts and VOD service. SNS is developed few years ago, then appear TV and Social TV [3-7] was launched combining SNS. Social TV is using IP, IPTV and SNS platform that combines service and share a variety of content with multiple people. In recent years, many services are developed based on cloud environment and varieties of cloud services are being developed. Social TV offers different way be able to sharing information. However, currently Social TV is a TV show has simple function such as users can comment, chat while watching channel. In this paper, we propose idea to improve the Social TV for SNS's user cloud-based to offer customized social platform technology. In recent years, many people are using Facebook, Twitter, when users watch a program belong to their favorite, they recommend this program to other users to help them easier to choose the best program.

Also, we offer a customized Social TV algorithm, it gives a new direction and help users become a lot of technological development.

## 2. Relate Research

In Korea, there are various Social TV services are being developed. One of the first social services is “SOTY” which coincided with the London Olympic Games 2012. In Korea, there are various Social TV services are being developed. One of the first social services is “SOTY” which coincided with the London Olympic Games 2012. SBS also releases SBS content hub providing program-related videos, images and information.

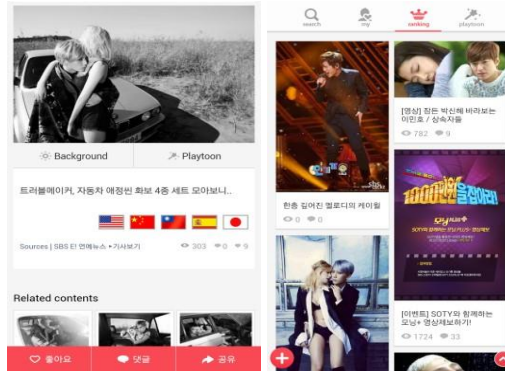


Figure 1. SOTY App Running on Smartphone

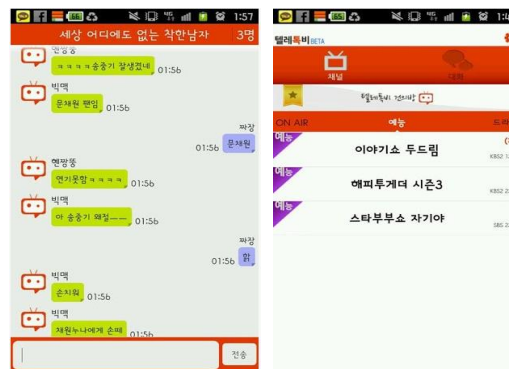


Figure 2. Teletalkvi App Running on Smartphone

“SOTY” produced by SBS associated with the TV program, updated the photographs of the stars in real time. Not only that, users can get the information about fashion, beauty, place of interest. However, this service only provides SBS programs and the comments and replies are also limited to these show. With the miniaturization of the modern family size, TV viewing now is more focused on individual and less than a crowd service. But while watching TV, people also wanted to have conversation with someone. Teletalkvi emphasis on application to chat and TV channels, so users can see at once the timeline of integrated applications. This growing trend recently said one of the families, if not one of the family as the family gathered to view a lot of TV difficult. This application is not watching TV function. However, TV viewing time is specific chat channel that the TV channels, TV to watch while users chat with people from a wide range of applications as is. Poor TV channel chatting, as well as accept real-time time line can be seen, a variety of people and can form a

common ground. By using this application, users is not alone while watching channel, they can have conversations with various people. When viewers in Social TV, they can talk to each other, but simply functions like chat and SNS Social TV. TVing is a service developed by CJ group offering 200 live channels. The services allow users to watch high-definition programs, VOD on smartphones, tablets and smart TV. TVing provides SNS interoperated video sharing, real-time chatting via separate chat window. There is also shopping channels, with respect to the desired product and contact the agent, or by using a smartphone to be able to make purchases. Because the flow path TVing service, other than the various features included in the application, and the periodical update conducted. Users than the TV when users want to select an actor, VOD is updated in real time as the notification service allows.



Figure 3. TVing App Runs on Smartphone



Figure 4. Everyone TV App runs on Smartphone

Everything on TV users does not need to register before users can watch free TV. 250 different channels and, in the channels of the user is viewing a Facebook, Twitter, KaKaoTalk, SMS, and the real-time information to be shared. Further, when watching broadcast it gives each earn points, the user is credited by the pointer, can participate in a variety of events. Everything on TV is broadcast, as well as specialized channels are included in shopping, shopping channel than the user is connected to the phone if users want to buy or the purchase of a smartphone to be able to help. When wireless Internet speeds fast, a wide variety of applications have been developed using a smartphone. DMB broadcasting in existing IPTV to change to HD broadcasts as, in a number of ways to study the trend. Recently, rapidly growing user and SNS, Social TV word has been created, rather than in the same space with the viewing, to various places in the TV can be seen, common ground so that the formation and development of various services offered in progress. However, applications are currently being serviced Social TV Submit SNS simply watching TV, chatting, shopping

is all payment functions. In this paper, we use a lot of users are using the SNS, a user area of interest to analyze and thus fit the TV channel service, customized to support the Social TV service. In addition, TV channel with respect to real time, so that information can be shared.

### 3. Customized Social TV Platform



Figure 5. Social TV Mobile App Main Screen

Social TV as shown in Figure 5, a variety device has Android operating can be used. However, for a detailed description, we used a tablet based on android to describe. Figure 5 shows a screenshot of Social TV platform driven. Firstly, user sign in with a Facebook or Twitter account. Figure 5 has six parts, below is describes for each part. Figure 5 (1) shows the STB (Set Top Box) [8-10] connected to the series associated with the program being watched TV shows information. TV under the blue bar displays the current status of the TV program, and website button next to the title of the TV program makes the connection associated with the website. Users can search the site their currently watching a TV program and go into the site and gives a fast. TV program gives information about the site of the actor, and a guide including the schedule. User information related to the TV viewing, as well as can be found without searching. Figure 5 (2) shows a current streaming time of the list of channels is displayed. Users can watching TV broadcast at the current time. In addition, with favorite button, users add their favorite TV channel in the list will appear. TV programs are listed to the right of the user to press the star shape can easily be favorites. Figure 5 (3) shows the entire program targeted subscribers to sort and show the audiences from the source channel. This is what viewers are watching TV channels and check if each time the show is in real time to reflect. The user can easily see the current popular channels and users are able to chatting online with other people while watching TV. For example, if user A is watching TV broadcasting, the chat list has titled A displayed, A can make conversation while watching TV. Figure 5 (6) shows when the user selected TV channels then related words are showed. Words associated with a portal site to work together in real time, allows TV channels to the output associated with the word. User portal is shown in Figure 5 (4), there are three connections to the selected site. For example, to check Google site, in Figure 5 (6) some related words appear. The user at any time by using related words, various information can be obtained.

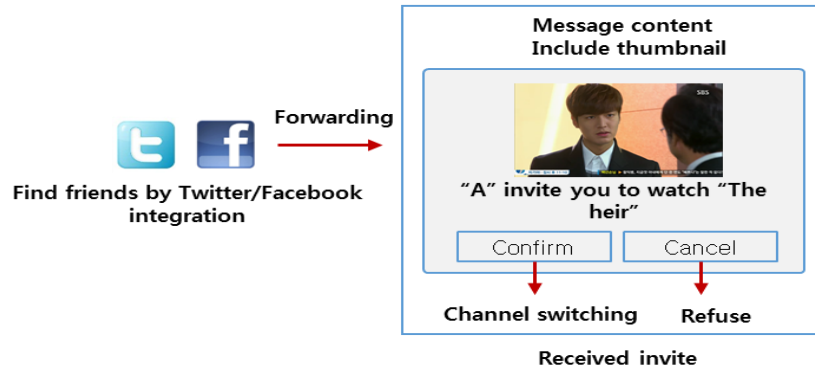


Figure 6. "Watch together" Action Flow

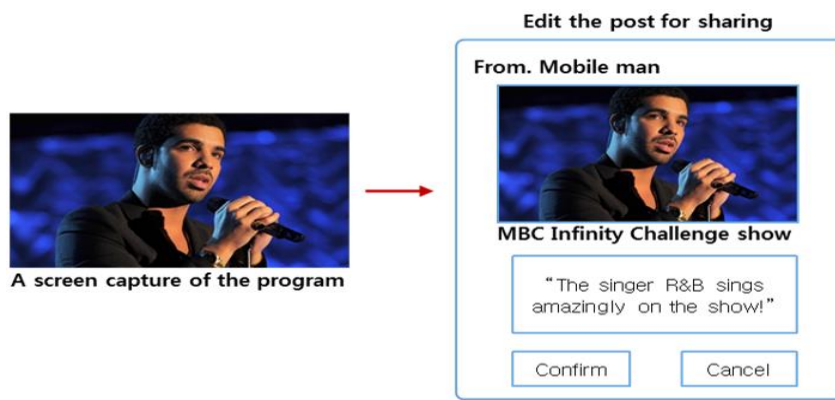


Figure 7. "Recommend" Action Flow

When users want to share the TV channels with their friends, they will press the button of the "Watch together" in Figure 5 (4), it is shown detail in Figure 6. Users are using Facebook or Twitter account, users are currently viewing the TV channel so that users can share. Invited confirm button is pressed, the user is invited to the use of the TV channels. If users press the confirm button when users are watching TV, the invited users can chat, and TV watching. If cancel button is pressed, the window will be close. Detail of Figure 5 (4) is shown in Figure 7 for "recommend" button. If users want to recommend to other their friends a TV channel by sending a message. View and chat with the messages users might not otherwise do. However, Confirm button is pressed, the TV channels users might see one, and if the current TV channel is not broadcasting, VOD service at any time, users might be connected to be able to see it on the TV channel. "Watch together" as service and watch TV at the same time, TV broadcast is finished, a message is automatically destroyed. However, the service Recommend Cancel List later by pressing the buttons using the user who recommended TV channel so that you can view at any time. Users are unaware of the information of all TV channels, TV programs and share useful and if users want to recommend a TV program at any time using the service to share TV shows, and other information that is shared by a variety of online as well as offline also helps to be able to shape a consensus. Figure 5 (5) having the feature of the four buttons is composed. Figure 5 (5) shows users can login. When a user log in, the screen changes as shown in Figure 5 (5). The output of three buttons: "Friend Request" buttons for various user and friends can be performed in order to recommend the TV with friends to be among the first users. "Accept Friend Request" button

appears in the list of friends is requested, the users "Accept Friend Request" button to select a desired user can accept them. Figure 5 (4) is a list of friends "Watch Together" button, or, "Recommend" button can be sure.

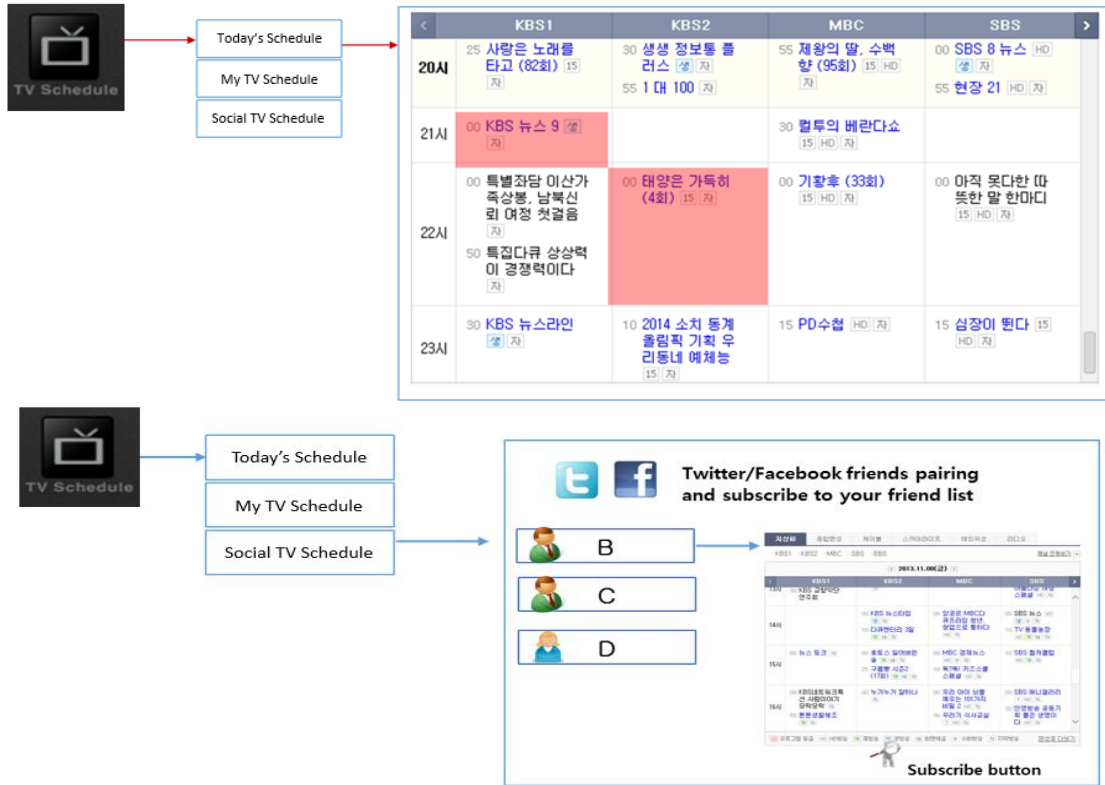


Figure 8. Social Network and TV Schedule Management Function



Figure 9. TV Schedule Table using Mobile Apps

Finally, the "TV Schedule" button shows a list of the various TV Schedule. Schedule of TV programs are provided by customized Schedule, TV Schedule a wide range of people and

is divided into shares. Figure 8 shows example of the capabilities after the "TV Schedule" button is pressed. After "TV Schedule" button is pressed three buttons appear, "Today's Schedule" is currently being broadcast by TV Schedule is released. Full TV schedule at a glance, users can be sure, users want to schedule the broadcast or VOD services using their last broadcast can watch the TV. "My TV Schedule" is complete TV Schedule of each user by using Facebook and Twitter, cloud server analyzes the information to the user's SNS. Based on the analysis of the user to select TV channels, SNS information and the user selection of the usual viewing a TV channel and a channel group favorites by incorporating, customizable user shows a TV Schedule. Finally, the "Social TV Schedule" using the Facebook and Twitter accounts of users that can share TV Schedule service. My TV Schedule is personalized TV Schedule for each user to share various services to other user. Users can also see their friend's TV Schedule.

## 4. Social TV Platform Providing a Customized Way

### 4.1. Customized Social TV Environment Configuration

The server PC using MySQL as a database, to storage the channel information, user's SNS information, and schedule information. MySQL is a database of the most commonly used program such as a web for storing various types of information required elements. We provide Social TV platform to customized user information, TV information is stored on MySQL. SNS information and TV program of a user by analyzing the information using Hadoop. Spring Framework is provided to the user via a smartphone. Channel information of the user and other users of the channel so that they can share information and use Apache Tomcat [11] and the Spring Framework [12]. Tomcat Apache Tomcat is Web application server consists of a combination, we have to provide a platform for customized Tomcat apache web server and JSP/Servlet container features are used. Spring Framework is to reduce the complexity of application development tools provide customized Social TV platform allows us quickly.

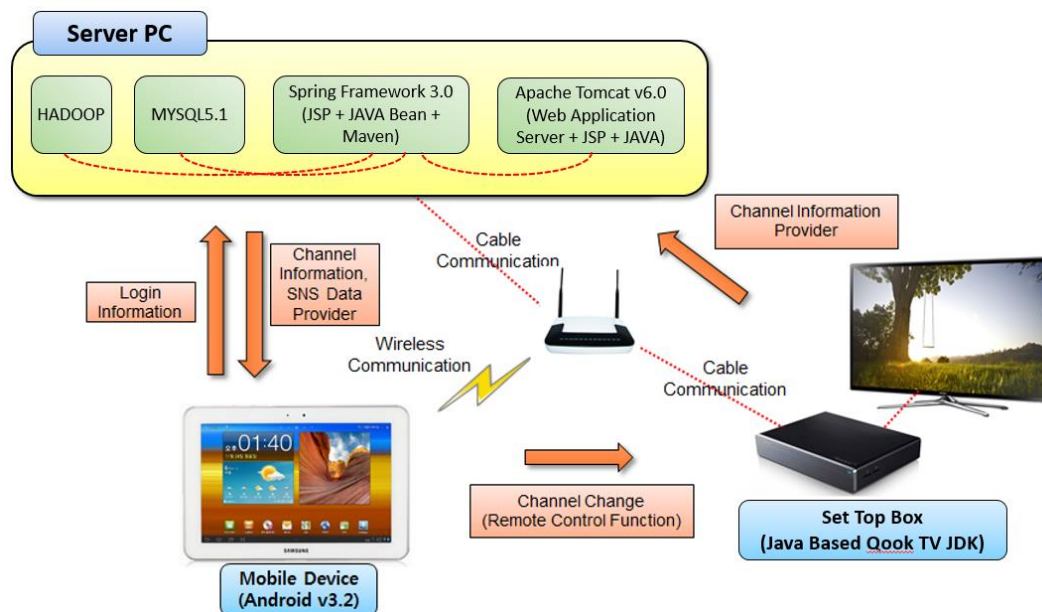
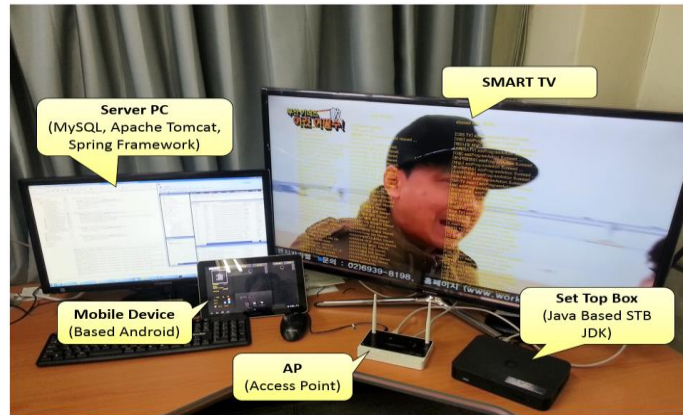


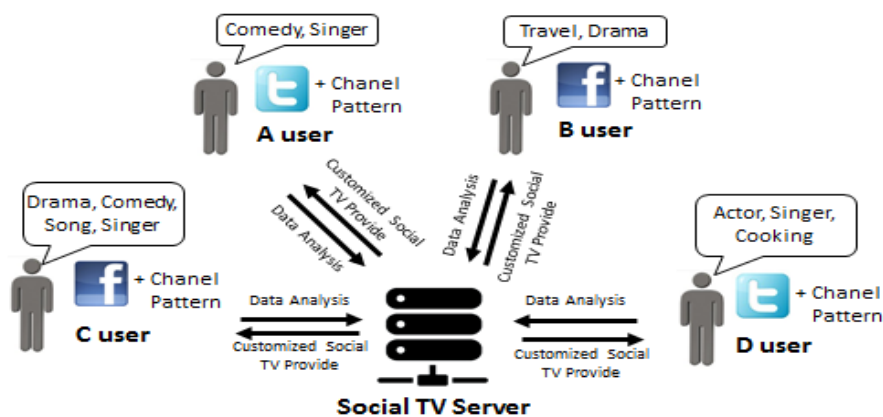
Figure 10. Configuration for Whole Environment



**Figure 11. Providing a Test on Social TV Platform**

Server PC, the STB (Set Top Box) from all channel information currently are being broadcast via the Tomcat server, and using MySQL to store information. In addition, MySQL function information using the Apache Tomcat, JSON provides real-time information in the form. STB is the entire channel information is currently being broadcast to the STB using the JDK, daily basis and transmits the channel information to the server. JAVA JDK for Android-based mobile devices and Ethernet-based environment is linked to the STB, currently being aired on the channel information, views, or to be able to change the channel. The user's favorite channels and store the Tomcat server-based so that it can be shared, and the user via the mobile device and a preferred channel based on a channel to favorites TV Schedule Table provides customizable. Related information, read the information comes Tomcat MySQL based, data type and format is JSON, HTTP protocol to transmit. Figure 11 shows the actual test of Social TV platform. Linked to the server and the STB with a channel state information can be sent in real time. Smartphone based on Android read information to the server through STB a channel receives.

#### 4.2. Analyzing Method for Providing Social TV Based on IP Network



**Figure 12. User Customized Social TV Platform**

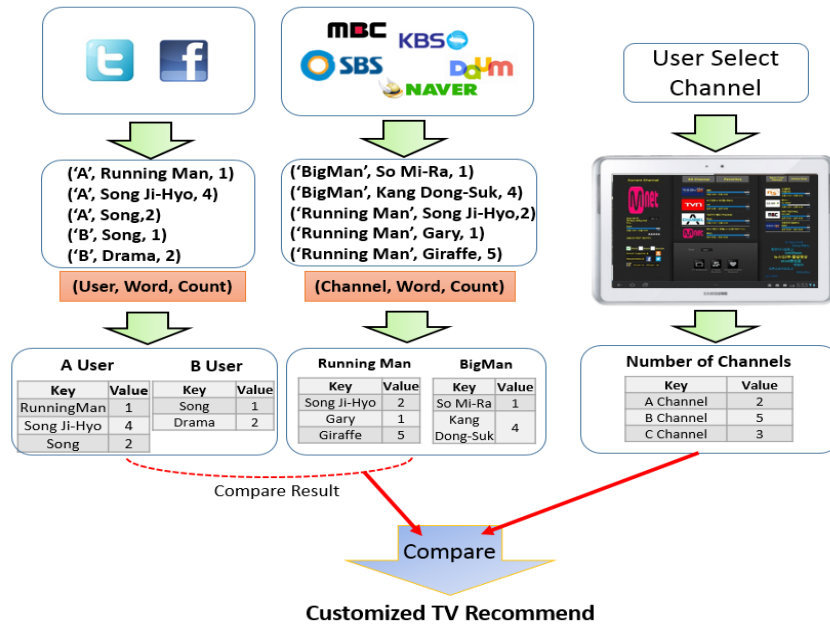
Figure 12 is a social TV platform that provides a customized picture. The server analyzes the user's Facebook, Twitter, users have no interest in any field should be determined. For



example, a user's Facebook B watching drama which has come up with a lot of the words. Social TV users are placed posts to the server at regular intervals to the analysis user B favorites to provide the drama associated with the TV channel. Social TV server use users' Facebook, Twitter posts to identify and come up with a post to check the frequency of the words, TV channels of information, compared with the high frequency of the TV channels are provided to the user. Social TV channel with a user connects to server via IP network, the user's social TV information is monitored by server. Users can select the TV channel or watch TV channels, the frequency of choice or the time to check how often your information on Facebook, Twitter, plus the former is higher than the probability of the personalized TV channel is to provide. Users have their own channels to find a server via an IP network in real-time TV user's social information by analyzing, thereby providing customizable Social TV platform. Due to this, the user can select a TV channel, there is, you do not need to worry, or the desired TV channel to the desired information can be easily used.

### 4.3. Social TV Platform offers Personalized Way

As explained previously, users can use any method of social TV channel users can send a description of the desired TV channel. In order to analyze the various data, Hadoop system is used, and with high probability in order to analyze the user's information via the IP network connected to the mobile device user's TV channel to be analyzed in real time.



**Figure 13. Customized TV Recommend**

Figure 13 shows the user-customized Social TV platform for the user to provide words analyzed per once day via the SNS. Social TV platform for users to take advantage of using the Facebook or Twitter ID is used to log in, the user will be analyzing the information. Only people who frequently use SNS day before be able to analysis of the data. After each day, delete the old data include the last day, refresh for the new data to analyze. System is applied Hadoop and MapReduce to analyze the data of the user quickly. The data is analyzed only once a day and the variation, the user is viewing channel and the number of fluctuations in the

real time. For example, if the user continues to look at the TV channel, the drama as a customized TV Schedule will be created. Table 1 provides an algorithm for user-customized Social TV platform. Social TV platform provide a customized server into 2 cases E1 and E2. With E1 is to be analyzed for a set time once a day, the user information of the TV channel to analyze the part of the word. SNS server access the user's information TV channels and website related to the analysis of the complete words.  $S_1$  is the each user using Facebook or Twitter, as shown in Figure 12 analyzing the word counts of the table to create.  $S_2$  is SNS data by analyzing the data in a home page, TV channels to find out which of the properties to make the table in accordance with the words of each user according to the analysis result value.  $R_1$  is  $S_1$  intersect with  $S_2$ , which compares the user- preferred TV programs. E2 is TV program which the user selected that if an event occurs, the corresponding TV channel count increases.  $T$  is TV channel.  $R_2$  is number of channel clicks.  $R_1$  and  $R_2$  based on a result value of a user-customized Social TV channel information to the smart phone can be confirmed through, make up a personalized TV schedule.

**Table 1. Provide a Customized Platform for TV Algorithm**

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```
IF  $E_1$  THEN
  WHILE Get the Frequently searched words from this data != NULL
    IF  $S_1 \in$  "SNS Data" THEN
      Count Number of Words in  $S_1$ 
    END IF
    ELSE IF  $S_2 \in$  "Broadcast TV Channel" THEN
      Count Number of Words in  $S_2$ 
    END IF
  END WHILE
   $R_1 = S_1 \cap S_2$ 
END IF
ELSE IF  $E_2$  THEN
  IF  $T \in$  "TV Channel" THEN
     $R_2 =$  Number of Channel Clicks
  END IF
END IF
  Compare Number Words and Number Channels in  $S_1$  and  $S_2$  THEN
  Combine Result  $R_1$  and  $R_2$  to Get Recommend List of Programs
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## 5. Conclusion

This paper proposed a customized method of Social TV platform. Now, Social TV has only simple functions such as chatting, comment, shopping service payments. We have improved the existing of the Social TV, give the platform is customized Social TV. User uses the SNS account when watching the TV and recommend TV channel by My TV Schedule. A variety of content to users according to their own preferences, users can view and share the content with their friends who can watch TV immediately. We have developed an On-Air and VOD Social TV at the real-time providing services or the place users want to be able to provide the service was. Currently, Social TV use JDK STB informative. In the future, we will continue research to improve this algorithm and apply it into Social TV.

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