Design of Cloud-based and IPTV Digital Signage System

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Abstract

The purpose of this research is to control, monitoring, and broadcast video, audio, text with digital signage system based on cloud and IPTV. It also provides multi content on one screen display included YouTube channel and RSS feed. Network connection transfer using internet protocol, the component of cloud-based and IPTV included with a content management system and a broadcast management system. Companies provide digital signage services are still using one of the ads in large size, this can alleviate the cost of advertising using digital signage. Therefore, the result is a designed from a display of how the content can be variatif when displayed on a digital signage as well through cloud-based and IPTV.

Keywords: digital signage, content management system, broadcast management system, cloud and IPTV

1. Introduction

Digital technology is very supported in the field of marketing or advertising. However, it certainly requires a large cost to use it because of more tools needed in the design. For greater efficiency in the use of ads and cost burden, that tools is digital signage. Digital signage display can be found in many places, such as the corners of major intersections, in buses, trains, building, shopping malls, and airports. We can't drive or walk around without happening to see digital signage players. Because digital signage can display dynamic multimedia content, whereas traditional signage can't play, traditional signage is quickly being replaced by digital signage [1]. Furthermore, recent digital signages are connected through digital networks, and it generally takes the form of client-server structure, where the server controls the clients to improve the effectiveness of diverse commercials and media [2, 3]. Digital signage system (DSS) can display video streaming media. Therefore, a DSS also need a broadcast management system that provides an environment in which users can conveniently edit display schedules, the statistic service, the category service, and the content price management service.

An internet protocol using a network connection, the component of cloud-based and IPTV system that provides live television, time-shifted programming, and video-on-demand services to customers also requires a CMS. Therefore, using the existing CMS from cloud-based and IPTV system for a digital signage system can save a lot of resources, including hardware, software, and time. The formulation of the problem in this research is How to build digital signage that can be used for a media delivery of information in the form of text, images, and video through cloud-based and IPTV. In order to make this research more focused, easy to analyze and avoid the occurrence of irregularities and also in accordance with the background that has been described. The purpose of this research: 1) create multi-screen video ads, streaming YouTube, RSS feed using cloud-based, 2) the content dynamic images, text can be played and can easily be changed, 3) real-time video can be played. The benefits of this research: 1) updating content is quick, easy and cost nothing with digital signage as opposed to traditional signage, 2) efficiency in being able to update the display with up to date content instantly saving resources and time for the business much to the benefit of the end user, 3) Increasingly, digital signage is seen as highly effective medium for advertising, promotion, and marketing.

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2. Related Work

This section reviews digital signage system. Jaegeol Yim [1] Digital signage system, is one of the most commonly used methods of advertisement. There is no business that does not have a sign. Traditionally, signage is static, in that content of the sign can never be changed. Nowadays, they use liquid-crystal displays and light-emitting diode-based video displays so that digital images, video and even streaming media can be dynamically displayed. While digital signage systems are quickly replacing traditional signage, internet protocol television (IPTV) systems are also widespread. Component of an IPTV system includes a content management system and a broadcast management system, among others. These components of IPTV systems can be used to provide content to digital signage displays as well as IPTV terminals.

![Figure 1. Main component of the IPTV](image)

System end users can access this system through the web portal using their smartphones, desktops, smart TVs, and tablet PCs in order to select and watch channels and videos. End users can also chat with others while watching channels, in order to exchange feelings and information about the video content.

Sugiura et al [2] proposed an open digital signage system to which many content providers can upload their content and many players can access the content management system to utilize the stored content. People are exposed to advertisements displayed on digital signage players. There are also bidirectional signage systems where users can enter instructions into the system. Bidirectional signage system can also provide targeted advertisement services. Considering user, device, and content profiles, targeted advertisement displays the content that is most likely to attract people in the most effective way.

![Figure 2. The architecture of digital signage system proposed by Sugiura et al. [2]](image)
Yoon et al. [3] presented a digital signage system based on a services delivery platform (SDP). The overall configuration of the system is seen in figure 2. The sales manager of the store (the seller) uploads advertisement content and sets the market banners using the content manager. The seller pushes advertisement content that is configured and edited by the content manager to the end users mobile devices when the point of access (POA) detects a request. An end user can spontaneously access a POA and make a request for a service. The service provider accepts signage service request from the sellers and creates signage services that meet sellers requirements. While creating a signage service, the service provider may use the content provided by the content server. The content providers create multimedia content for the seller and store the content in the content server. The network manager handes network and user information.

![Figure 3. Overall configuration of digital signage system [3]](image)

In this system, end users are accessing the signage system with their smartphones. Therefore, the system can guess the current location of the user and provide location-based advertisements. Their system contains a profile enabler that takes the user's preference and records it. With the help of the profile enabler, the system provides the targeted advertisement service.

3. Methodology

Qualitative research is used for the study and production of design solutions. Because in this study focused on examining the object directly on digital signage. Data collection used interview and observation method, in this case, the author does a question and answer. Also to obtain data that is both real and convincing then the author does a direct observation on the question. Design method to control, monitoring, and broadcast video, audio, text with digital signage system based on cloud and IPTV built use desktop application with visual studio. Where the location of video files and ads that want to be displayed on a store in the cloud-based, it can be called through several players IPTV that have been registered on the server.

4. Result and Discussion

The digital signage system at the center of the system integrated from cloud-based and IPTV. Below set-top flow of design from this study. Another type of user is the ordinary user who just has some idea of what you wants to display on the sign players. IPTV is a service that provides television programming services (sports, news, movies, etc.) and other interactive entertainment content (music, games, advertising) through an IP network broadband network. End terminals on customers may be desktop PCs or television monitors connected to the set-top box. Digital signage consists of 2 parts, CMS and SignagePlayer. Desktop-based CMS is installed on the cloud server and signage player on IPTV which is then used to display information.
The IPTV system receives ordinary users’ requests, analyzes user requirements, and produces multimedia content for them. Then, the digital signage system streams or transmits the multimedia content to the sign players. On digital signage, you can make scheduling your content with the content management system. The content manager has broadcast streams a live feed or a video to the IPTV system, then the IPTV system integrates the stream into the program and streams to the cloud. With content management system can control and monitoring ads on multiple screen display, sign display integrated high-definition display, media player with an efficient processor with an option for touch screen and Wi-Fi or LAN network.

The content manager offers remote management of content files to be played on a digital signage system. The content manager on desktop-based software provides central management of content and automates design and distribution of a wide variety of multi-media file format into a playlist. From the design that was made then we will try to display result from design cloud-based digital signage. Where the produce on display advertising in the form of videos, RSS feed and also advertising in text form. Design of the system requires a cloud-based to work optimally. With available wireless connectivity and remote management, deployment is quick and locations are easily changed, also the display has been tested using a LED TV connect to the server.

This design also includes text-based information with a little animation of the moving text flying from the left to right. Trials were conducted to test the capabilities of the digital signage on a cloud-based computer in windows to display the animation smoothly. In addition, the final look can also display pictures and also web pages that are connected to the internet. The above test results using the scheduling time, so each client is given a specific time slot to display certain information is also intended to test the responsiveness of the client and the server. Test scheduling on a desktop computer and a laptop running almost without delay.
5. Conclusion

Base on this study the result can be concluded are as follow: 1) digital signage system design has successfully showcased some the size of the display is divided into several sections according to the size of the client device and can provide ease in display ads, 2) digital signage can display the video offline as well as videos from streaming media. Also, can ads with many variations of an image and video, 3) digital signage can make ads more easily controlled and control the display quality of the image resolution is getting a nice image that will be displayed.

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