

# Study of Real-Time Cyber Physical System Using Signage Network

Sneha Govinda Bhangale

Department of Computer Science And Technology, Shri Sant Gadge Baba College of Engineering and Technology, Bhusawal, Maharashtra, India

## ABSTRACT

This paper is the study of digital signage networks and cyber physical system. Digital signage is a rising latest communication technology. It is a play role in today dynamic world as digital signage displays timely information, while reducing the environmental costs related with traditional printed signage. The system will display information based upon a "playlist" that can be dynamically updated. It never fails in single point of a television-based system, since each display has an attached processor and local storage containing both the information to be displayed and the local playlist of what is to be displayed.

**Keywords :** Digital signage, Real-Time Cyber Physical System, LED, LCD, VHS, CRT, MP-CAB, CMS

## I. INTRODUCTION

### 1.1 What is Digital Signage?

Digital signage is a component of signage. Digital signage is use technologies such as LED, LCD and projection to display content such as video, digital images, streaming media and information. It can be found in public spaces, museums, stadiums, retail stores, hotels, restaurants, transportation systems, and corporate buildings to provide way finding, exhibitions, marketing and outside advertising. Digital signage has been widely deployed in the urban areas for commercial multimedia applications, such as outside and inside advertisement, information dissemination, and venue-based real-time content display. Digital signage is raising a new communication technology. A digital sign is an electronic display that shows information, advertising, and messages [1]. "Digital signage is a network of adaptable displays that can be restricted electronically using a computer, allowing content to be altered slightly for the most targeted messaging possible"[2].

### 1.2 Content Management Server

The digital signage content may be often updated using content management systems, and also because of the mutual abilities available through the accompanying employment of real-world interfaces such as embedded movement detection touch screens, and image capture

devices which enable these forms of signage to understand who and how users are interacting with them, they are clearing acceptance as an alternative to static signage.

## II. METHODS AND MATERIAL

### 2.1 History of Digital Signage

There have been many directions throughout the years that have reshaped the way people communicate. Today we are experiencing such a trend in the form of a growing prevalence of digital signage.



Figure 1. Signage Technique

### 2.2 How Digital Signage Began

Before the first digital displays came along, trader used analog displays. The information was placed in analog media such as VHS tape. When digital media became available, mainly in the form of DVDs, the first digital signage displays came into being. The modern digital displays that are frequent today have only been around

for about five or six years, but the term “digital signage” was invented in 1992 in reference to a network of video walls in UK shopping centres. In the starting years of digital displays, both DVD and VHS content has been displayed on CRT monitors, the old type of tube televisions that people used before flat panels appear the market.

### 2.3 History of Cyber Physical System

The “cyber-physical systems” come in 2006, when it was composed by Helen Gill at the National Science Foundation in the United States. The related term “cyberspace” is associated to William Gibson, who used the term in the novel *Neuromancer*. It would be more accurate to view the terms “cyberspace” and “cyber-physical systems” as arising from the same origin, “cybernetics,” which was reformed by Norbert Wiener, an American mathematician who had a huge influence on the development of control systems theory. During World War II, Wiener pioneered technology for the automatic focusing and firing of anti-aircraft guns.

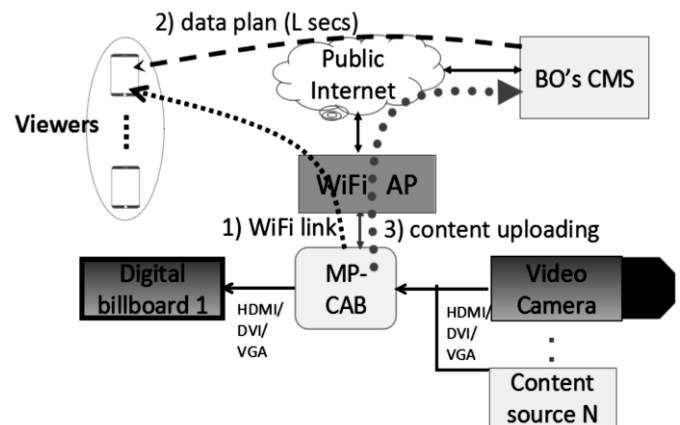
### 2.4 Review

Studies on signage networking and real-time media access via mobile devices have been extensively reported in the past decade, and they are devised for particular applications and various places. These studies have been applied to the fields of content management [3]–[4], on-line video processing [5], [6], dynamic control of multiple perspectives [8], and CPS based applications [8]–[9]. To the best of our knowledge, only [10], [9] is on real-time content access via Wi-Fi multicast.

### 3. The Interconnection of the MP-CAB

The paper will research a CPS and the application scenario that requires seamless collaboration among smart phones, MP-CAB, and the CMS. Specifically, the author will describe in detail how the CPS can achieve scalable delivery of both low- and high-resolution snap shotted images/pictures to possibly a large number of viewers through the Wi-Fi link and the public Internet, respectively. Based on a simple yet efficient multicast scheduling framework, It which is calculated as the latency since the viewer issued a request until the craved content is available to the viewer in either the lower high-resolution version. Such

responsiveness is considered an important quality of experience (QoE) for the CPS application.



**Figure 2.** Interconnection of the MP-CAB

The above fig.2 is study from the “On Achieving Cyber-Physical Real-time Snapshot Acquisition in Billboard/Signage Networks”[13] it summarizes the relations among the distributed entities: MP-CAB, CMS, Smartphone, and the Wi-Fi AP. The response delay taken as the performance metric of interest. The goal is to find the optimal system operation in terms of maximum feasible size of the multicast images under the constraint of expected response delay. To simplify the analysis For example, the response delay of 3.42 indicates it is 3.42\_ seconds. Assume a drag event uniformly happen, and during SCi the viewer’s drag must be for  $C' i$ . Two modes of viewers’ Smartphone are defined.

### 3.1 Conventional Signage

Conventional signage is a distributed and traditional advertising method that is used to deliver different messages and information in specific locations. There are dissimilar groups of advertisers working to allocate conventional signage. These advertisers use wide numbers of signs both inside and outside to broadcast their messages. Conventional signage is used near roads, markets, large shopping centers, bus stops, airports, railway stations, hotels, and casino. These signs are generally made from steel, vinyl, aluminium, plastic, glass, and paper display should be altered for these specific viewers.

### 3.2 Digital Signage

Digital signage is a wide discrete solution allowing consistent centralized management and publishing of

digital media to networked, digital displays. This technology is now gaining popularity and becoming more present. Digital signage consists of a display device and a display controller. A simple digital sign display

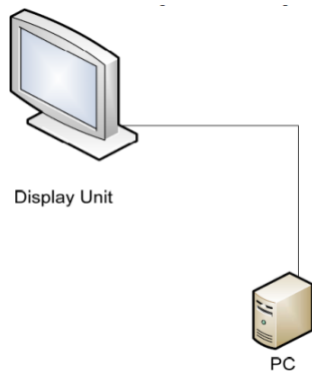


Figure 4. The simplest form of Digital Signage

### 3.3 Types of Digital Signage

There are three main types of digital signage:

- Stand-alone Digital Signage
- Web-based Digital Signage
- IPTV-based Digital Signage

### 4. Cyber Physical System

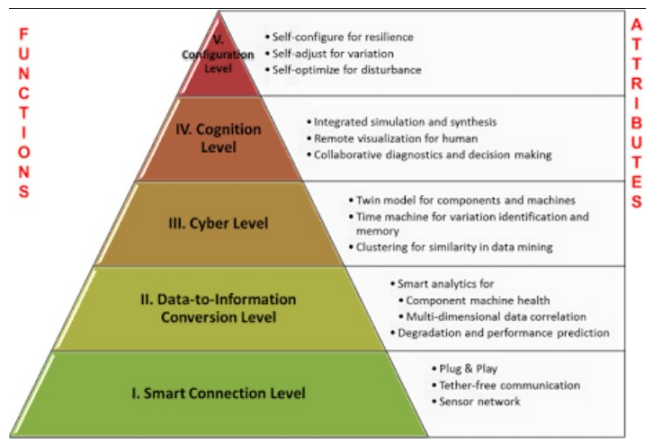


Figure 7. CPS for Manufacturing

A cyber-physical system (CPS) is a mechanism controlled by computer-based algorithms, tightly incorporated with the internet and its users. In cyber-physical systems, physical and software components are deeply interconnected, each operating on different special and temporal scales, exhibiting multiple and distinct behavioural modalities, and interacting with each other in a lot of ways that change with context.[11] Examples of CPS are smart grid, medical monitoring,

process control systems, autonomous automobile systems, robotics systems, and automatic pilot avionics.[12].

## III. RESULTS AND DISCUSSION

### ADVANTAGES AND DISADVANTAGES

#### 5.1 ADVANTAGES of CYBER PHYSICAL SYSTEM

- Fast way to ensure safety in various real world processes.
- Ensures efficiency in various real world processes.
- Improvement in life value for limitless people.
- Potential to bring a positive revolution to the world.

#### 5.2 DISADVANTAGES of CYBER PHYSICAL SYSTEM

- The type scenario is possible terminator
- Redundancy
- Improbability
- Loss of purpose in life

#### 5.3 ADVANTAGES OF DIGITAL SIGNAGE

- Digital signs allow you to display emergency messaging in real time.
- Digital signs are better on the environment they reduce paper waste.
- Digital sign content can be updated within a matter of seconds.

#### 5.4 DISADVANTAGES OF DIGITAL SIGNAGE

- Return on investment
- Still new and improving
- May require multiple partners
- Environment
- Lack of understanding

## IV.CONCLUSION

Paper has introduced a new Cyber-physical system (CPS) for real-time content signage networks via the viewers' smart phones. Author firstly defined an add-on device mounted to each signage, called Media processor content access box (MP-CAB), which

collaborates with the content management server (CMS) and the viewers' smart phones for achieving the desired applications. This observation becomes more obvious when  $p$  and/or is smaller where more trials are required for the smart phones to completely receive all the data blocks. There are quite a number of issues concerning the security of the system that need to be examined and addressed. There is also a need to do detailed performance measurements.

## V. REFERENCES

- [1]. Wikipedia - [http://en.wikipedia.org/wiki/Digital\\_Signage](http://en.wikipedia.org/wiki/Digital_Signage)
- [2]. ScalaInc - <http://www.beaver-group.com/files/pdf/digital-signage.pdf>
- [3]. M. Nath and A. Arora, "Content management system : Comparative case study," in Software Engineering and Service Sciences (ICSESS), IEEE International Conference on, July 2010, pp. 624–627.
- [4]. G. Deitz, "Developing a content management system for siguccs," in Proceedings of the 36th Annual ACM SIGUCCS Fall Conference: Moving Mountains, Blazing Trails, ser. SIGUCCS '08. New York, NY, USA: ACM, 2008, pp.
- [5]. T. Chattopadhyay and A. Chaki, "Identification of trademarks painted on ground and billboards using h.264 compressed domain features from sports videos," in Computational Intelligence, Modeling and Simulation (CIMSIM), 2010 Second International Conference on, Sept 2010, pp.219–223.
- [6]. Y. Li, D. Zhang, X. Zhou, and J. S. Jin, "A confidence based recognition system for tv commercial extraction," in Proceedings of the Nineteenth Conference on Australasian Database – Volume 75, ser. ADC '08. Darlinghurst, Australia, Australia: Australian Computer Society.
- [7]. Y. Yoshida and T. Kawamoto, "demo] displaying free-viewpoint video with user controllable head mounted display demo," in Mixed and Augmented Reality (ISMAR), 2014 IEEE International Symposium on, Sept 2014, pp. 389–390.
- [8]. J. Lee and K. Yoon, "The application of digital signage system using smart device," in Advanced Communication Technology (ICACT), 2014 16th International Conference on, Feb 2014
- [9]. "Smart signage: A drag gable cyber-physical broadcast/multicast media system," Emerging Topics in Computing, IEEE Transactions on, vol. 1, no. 2.
- [10]. J. She, J. Crowcroft, H. Fu, and P.-H. Ho, "Smart signage: An interactive signage system with multiple displays," in Green Computing and Communications (GreenCom), 2013 IEEE and Internet of Things (iThings/CPSCoM), IEEE International Conference on and IEEE Cyber, Physical and Social Computing, Aug 2013
- [11]. "US National Science Foundation, Cyber-Physical Systems (CPS)"
- [12]. Khaitan et al., "Design Techniques and Applications of Cyber Physical Systems: A Survey", IEEE Systems Journal, 2014.
- [13]. On Achieving Cyber-Physical Real-time Snapshot Acquisition in Billboard/Signage Networks.