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Application and Practice of Network Broadcast Technology in Propaganda work in Universities

-- A Case study of Capital University of Economics and Business

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Abstract

Following the COVID-19 outbreak,the universities responded to the call of "suspension of classes without suspension of schooling"positively.Under the condition that they cannot return to school, teachers and students study at home and know about the campus real-time news through various school medias.In this context, the News Center of Capital University of Economics and Business, with the help of new media technology, has transformed several traditional video programs into live network programs, and achieved good publicity effects.After a short period of researching and exploration, the author groped out a set of live broadcast system that suitable for the news publicity work of our school gradually.Through the analysis of several live broadcast activities completed by the school news center in the first half of 2020, this paper tries to summarize the solutions suitable for college network live broadcast from two aspects of technology and application.

Keywords

Network broadcast,University publicity, Application and Practice.

1. Introduction

Network broadcast has become an important way of media communication in the new media era.Especially in recent years, with the low cost of network broadcast equipment, mobile terminals represented by phones can independently complete a set of complex live broadcast operation processes such as collection, processing, coding, packaging, streaming push and distribution.On the other hand, the network broadcast platform has a wider range of choices higher vertical degree, and more accurate positioning of users. Therefore, more and more universities choose network broadcast as an important method of news publicity, which has achieved good publicity effect.

2. The Basic Principle of Network Broadcast System

2.1. The Basic Principle of Streaming Media

Streaming media is a media format that is played on the Internet by means of streaming transmission,such as: audio, video or multimedia files. Streaming media does not download the whole file before playing, only put the beginning part into the internal storage.Streaming media's data stream is transmitted and played at any time. Compared with the simple download mode, this streaming transmission mode not only reduces the start up delay, but also reduces the demand for system cache capacity.

RTMP(Real-time Messaging Protocol) is mostly used in the transmission of streaming media in WAN.It is a protocol developed by Adobe Systems for the transfer of audio, video and data

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between Flash players and servers. Because Flash player is installed on nearly 99% of PCS around the world, viewing RTMP streaming video and audio does not require a plugin. Users can directly watch the streaming media by opening the web page directly conveniently.

2.2. Working Principle of Network Broadcast System

Figure 1 shows the structure of the network broadcast system.The coding workstation is responsible for the production of streaming media;video server is responsible for streaming media release; the client player is responsible for receiving the streaming media.

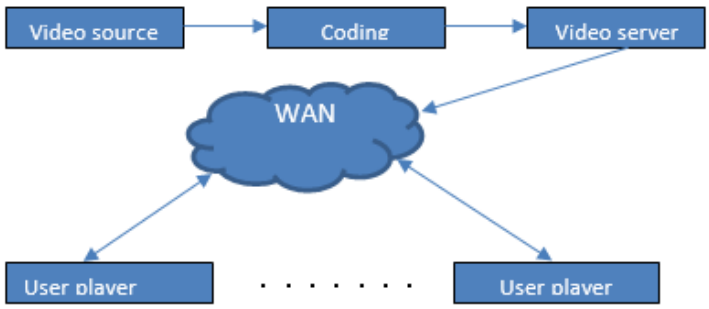

Figure 1. Network Broadcast system

In the network broadcast system, the video signal source includes a variety of types, which can come from the camera, TV program signal and so on. The coded workstation receives the video and audio signals from the program source through the circuit, and then the video acquisition card in the workstation converts various signals into digital video signals. After compression processing, the corresponding format is sent to the video server.While the signal uploaded by the video server is not uniform, it depends on the specific requirements raised by the client first. The video server sends video signals in streaming format according to the needs of each client, so that all users can use the streaming media player smoothly.

3. CUEBTV Live Broadcast System Architecture Design

The design of the campus media live broadcast system must be combined with the specific needs of all kinds of school business, and analyze the system architecture and feasibility of the functional module technology comprehensively .For example, based on the existing technical conditions and practical business requirements of the university, the Capital University of Economics and Business has summarized two kinds of current network live broadcast technology schemes suitable for the university gradually through the practice of multi-type and multi-event live broadcast activities in the past half year.

3.1. Studio Live Streaming Push System

This system is relatively simple in design, that is, on the basis of the existing FOUR Channels HD broadcasting system, a live streaming push system is added, as shown in Figure 2.

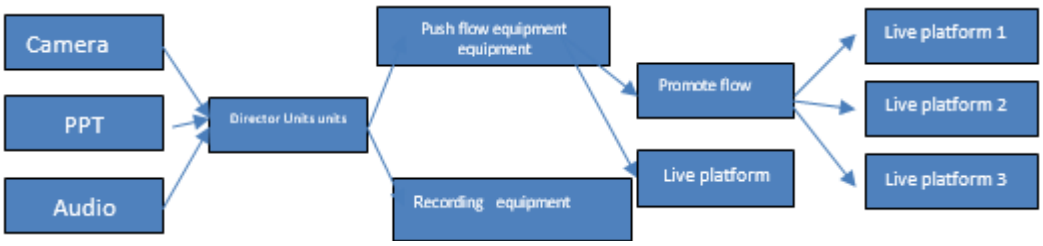

Figure 2. Studio live streaming system

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The studio broadcast system is based on the perfect studio equipment, which can guarantee the professional level picture quality and sound quality at the acquisition end. In the professional lighting, stage design and scene production environment, the visual effect is closer to the production level of professional TV stations. Its disadvantages are high cost, strict requirements on the site, long construction cycle. It's more applicable for the university which has built a studio.

3.2. Mobile Live Streaming System

This system is mainly aimed at outdoor or indoor live broadcast activities without fixed location. Mobile phones are used to collect and push streams, and wireless microphones are used for field radio reception.By using high-performance mobile phones, you can achieve picture quality and sound quality close to that of professional cameras. At the same time, it can realize simultaneous live broadcast on multiple platforms with the help of push stream APP, just using one machine.The disadvantage of mobile live broadcast is that it is affected by signal strength greatly, and the phenomenon of picture lag and frame drop occurs occasionally.In addition, there are also higher requirements for photographing mobile phones.Mobile live broadcast should try to choose the model with high processor performance, strong battery life, good heat dissipation and high lens quality.

The following is a detailed summary of the details of the above two live broadcasting systems based on several live broadcasting activities produced by the news center.

4. Case analysis of Three Application Scenarios

4.1. Studio Live Broadcast System -- Face to Face with the Dean

"Face to Face with the Dean" is a regular program in our school's annual enrollment season. In previous years, it was recorded broadcast, but this year, it is live broadcast.The program design is in the form of one host and one guest host, three cameras are arranged on site for shooting, and PPT signals are added to coordinate with guests for presentation.The host interacts with the audience in the live broadcast room by viewing the live broadcast pictures on mobile phones. The column carried out three live broadcast, the exam's parents pay more attention, the page view has increased greatly compared with last year.

The streaming device used for program live broadcast is Blackmagic Design ATEM Mini Pro FOUR-channel HD streaming switching station. Since the live streaming only needs to be connected to the PGM signal of one channel studio, only one channel input is actually used for the switching station.Then, the TYPE C interface of the switching station is connected to the laptop workstation with the connecting wire, and the laptop will automatically recognize signals. Then, the laptop will be used to run OBS or a live broadcast assistant, etc. The software will generate RTMP push stream address and copy the address to the corresponding pull stream platform, and live broadcast can be realized.As shown in Figure 3.

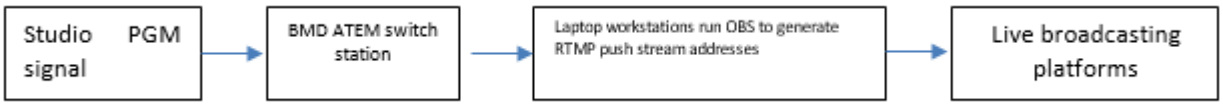

Figure 3. Studio live broadcast system operation structure

In this process, the role of ATEM switchboard is to transcode studio SDI signals into streaming media signals, then distributed by the streaming software on the laptop. ATEM switchboard has small size, rich interface, excellent performance, good stability of continuous load. It is worth mentioning that ATEM switching station already has the function of streaming. However, due

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to the limitation of software, it only supports the live streaming of foreign media platforms such as YouTube and Twitter, and the live streaming application of domestic platforms also needs to be used with the laptop workstation.

4.2. Outdoor Mobile Live Broadcast -College Enrollment Service Guangming Live Broadcast

Guangming Live broadcast is an important part of the school's recruitment publicity work over the years. This year due to the COVID-19 prevention and control requirements, in the case of external personnel cannot be tolerated, the press center to ensure the smooth progress of live events, and after detailed research and practice, to purchase a batch of live and form a complete set of equipment, including high performance long range mobile phone (Huawei MATE30 Pro), charging treasure, 5G portable WIFI (China telecom), tablet PC, the Bluetooth headset monitoring, handheld stabilizer and wireless microphones, etc. After two tests, the equipment was adjusted and optimized in time, and the live broadcast work of nearly two hours was completed with high standards.

To solve the on-site radio reception, we connect the 3.5mm interface of RODE wireless microphone to the TYPE C interface of the mobile phone through the wiring. After testing, the sound quality is clear and the noise reduction effect is excellent. In terms of signal, we did not use the mobile phone card to push the stream directly, but uploaded it through the mobile phone Wi-Fi connection 5G transmitting packet. On the one hand, it can reduce the load of mobile phone, reduce the body heat and power consumption. The second is to ensure the continuous stability of the signal. According to the actual measurement, except the internal signal of part of the building is slightly weak, occasionally there is a lag. The most signal of the live paths are stable basically, and the remaining battery of the shooting phone is still 50% when the nearly two hours of live broadcast is over.

In terms of live streaming, we cooperate with the live streaming process of Guangming Network, pre-install the "Mobile Live Station" APP on the mobile phone, and shoot through this program. The signal was send to the background of Guangming Network, and then transferred to a live streaming platform. Finally, it was broadcast on the official Weibo of the school.

4.3. Indoor"one-to-many platform" Mobile Live Streaming -- "Marvelous Food in Our University"

“Marvelous Food in Our University” is a new "food reality show" program launched by the news center for students. By the campus canteen chef displayed the former campus net celebrity food production, in order to carry forward the economic and trade traditional food skills, stimulate young students' labor consciousness and self-reliance ability. The program had attracted a lot of attention. During the one-hour live broadcast, nearly 2,000 people watched it at the same time, and the total number of views reached 20,000 (the number of students in school is less than 10,000 on weekdays).

Different from the previous two live programs, “Marvelous Food in Our University” as our first live attempt, we did a lot of research and preparation work in advance. After repeated demonstration and debugging, the most suitable technical scheme was selected to ensure the broadcast effect. In addition to an official Weibo broadcast platform, this live broadcast also joined the central video platform. For this reason, after the field test, we developed a detailed live broadcast plan. According to the requirements of COVID-19 prevention work, the recording venue was set in the back kitchen that was not enabled during the holiday. The 4G signal was poor, and the campus network could not be covered by Wi-Fi.

Therefore, we decided to use mobile AP network to solve the signal problem, to ensure that the anchor's walking path from the outside to the inside of the building, from the corridor to the kitchen signals constantly, not stuck, clear and smooth picture.

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At the same time, Da Guan Live streaming APP was installed on the shooting phone, and the push stream address was generated and provided to a live broadcast and central video. The anchor interacted with the user on the scene with two mobile phones.

5. Problems and Solutions

First of all, in the program Guangming Live Broadcast, since the shooting phone we chose has only one TYPE C interface, after the microphone is connected, the phone can no longer be powered by the charger. It is estimated that if continuous shooting is conducted in the condition of Wi-Fi push stream, the phone with 4000 mah battery can last for about 2 hours. Of course, this also takes into account the actual power consumption of models with different brands and processors at different ambient temperatures. Moreover, due to different transmission protocols of the Bluetooth headset, the Push stream APP cannot recognize the Bluetooth microphone. We have changed various brands of Bluetooth headset and live streaming platform, but none of them can receive the sound normally. Therefore, it is better to choose a mobile phone with an independent 3.5mm audio interface for a long time outdoor live broadcast, which can ensure sound collection and power supply at the same time.

Second, screen setup problem. At present, most of the existing live streaming platforms only support portrait shooting. If the front phone is used for landscape shooting, the system will automatically rotate the picture by 90 degrees. The final picture seen on the user end is the portrait of 9:16, and the host is lying on his/her back at 90 degrees. Therefore, it is necessary to pay attention to the selection of horizontal and vertical screen shooting when setting the background of live broadcast. If the horizontal screen is selected for shooting, the normal display effect of the user side will be the 16:9 normal screen on the mobile phone (portrait screen), and the interaction area of messages in the broadcast room will be the bottom two-thirds.

Third, the selection and docking of live streaming platforms. According to the investigation, currently, the broadcasting platforms used by universities are TikTok, Quick worker, Central Video and Bilibili, etc. Some universities also use their own live broadcasting platforms. Before each live broadcast, a live streaming platform should be selected according to the specific release requirements. Taking our university as an example, we have used three streaming software, OBS, Daguan Live broadcast and Mobile live broadcast, with relatively stable signals and rich custom functions. In addition, for more than a pair of live, every publishing platform requirements are not identical, such as boot figure, pushing the first figure and broadcast content abstract information, need to arrange the specialist with live platform communication and coordination. So before each live events, head of preparation work should do well in personnel, to form a team with clear division of labor, the test in advance, controls the live process.

6. Conclusion

With the continuous development of media technology, network broadcast plays a more and more important role in the news publicity work of colleges and universities. With the promotion of news publicity, the workload and scope related to network live broadcast are also increasing. Adopting convenient, efficient and flexible network live broadcast system according to local conditions can greatly improve work efficiency and reduce the investment of personnel and equipment. Therefore, it is necessary to carry out the overall planning and design of the network broadcast system based on the university's own characteristics and practice.

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