

# VCenter: A Digital Video Broadcast System of NDAP Taiwan

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**Abstract.** VCenter, a platform for broadcasting digital video content, was developed by the National Digital Archives Program (NDAP), Taiwan. The platform provides a number of functions, such as digital video archiving, format transformation, streaming broadcasts, editing, geotagging, and blogging. The concept of Web2.0 is conducted in VCenter to increase user participation and improve interaction between the system and the user.

For videos, VCenter adopts Flash technology because it has a multi-layer architecture and it can handle multimedia content. We can add watermarks or captions as layers to videos without changing the original video's content so that when users browse videos, the multi-layer overlaps the original video layer in real-time.

VCenter serves the Union Catalog system of NDAP as a video broadcasting platform. In addition to archiving the valuable videos of NDAP, it allows the general public to archive, broadcast, and share digital videos.

**Keywords:** blogging, digital archive, digital video, Flash, watermark, Web2.0.

## Article

To date, the National Digital Archives Program (NDAP) of Taiwan [3], which was launched in 2002, has archived more than three million digital objects. All the metadata of digital collections is stored in the Union Catalog (UC) system [7]. Users can search or browse all of the NDAP's digital collections through the UC system.

Processing digital video data in UC is a complicated task. Because of the different digital video formats used by content providers, UC needs to transform digital videos into a uniform format for general viewing. In addition, to protect the copyright of digital video content, digital watermarks must be added and transmitted by streaming to reduce the risk of illegal use. As these processes consume an enormous amount of manual efforts and computing resources, we have developed the VCenter [8] system to process digital videos, and thereby enhance the capability of UC.

The most obvious difference between the VCenter platform and general multimedia content management systems is that VCenter is based on the concept of Web2.0 [2,4]. The main objective is to increase user participation and improve interaction between the system and the user. Furthermore, as blogging is an important Web 2.0 application, we have incorporated a blogging function and interface in the design of VCenter.

In addition to offering basic functions, such as file uploading, digital video format transformation, digital video streaming, and file management, VCenter also lets content owners decide whether to make their digital videos available to the general public for viewing. After watching a video, users can comment on or rate it. Based on users' responses, VCenter then lists popular videos and recommends content on the homepage. The VCenter platform not only provides functions for users to query videos by entering keywords, it also incorporates the concept of Folksonomy [6]. Users can define a video's category tag themselves so that it is easy to search for or browse a video.

VCenter also provides online editing and geographic functions for videos. The online editing functions allow users to add digital watermarks, captions, and cue points to their videos in real-time on the Web without installing video editing software in the client computer. Meanwhile, to provide geographic capability, VCenter incorporates geographic information systems (GIS), such as Google Maps [5], which allow users to set the longitude and latitude of digital videos. As a result, users can search for digital videos by spatial search or by browsing digital videos on a map.

We adopted the Flash video (FLV) [1] format for VCenter; hence all videos uploaded by content providers are transformed into FLV format. The advantage of using FLV is that it has a multi-layer architecture, which allows us to add a new layer to video frames in real-time. The function also allows us to add watermarks and captions to videos easily and rapidly in different layers, without changing the original video's content. When users browse videos, the multi-layer overlaps the original video layer in real-time.

VCenter serves UC as a platform for digital video broadcasts. When a user browses video content in UC, VCenter transmits video data to the user. In addition to archiving the valuable videos of NDAP, VCenter also allows the general public to archive and share videos. The integration of VCenter with the UC system is shown in Figure 1. By using the platform, content owners can edit and broadcast digital videos easily, which encourages the sharing of video content. In this way, more "folk" videos will be collected, and thereby increase NDAP's scope and impact on society.

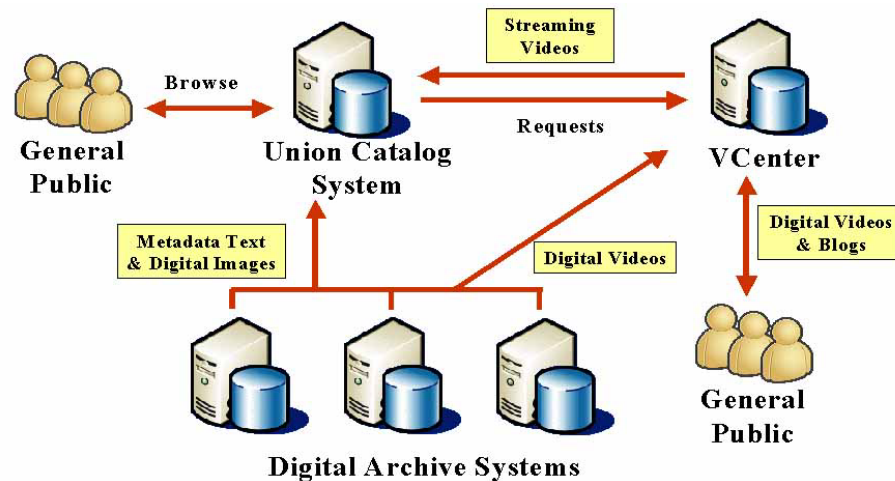


Fig 1. The integration of VCenter with the UC system

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