

# Including Videos in Photo Books

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## Abstract

This paper describes how videos can be implemented into printed photo books. More than half of the consumers take videos with DSCs, the other half with camcorders, smartphones and other devices. Therefore consumers making photo books are a great target group to offer a service implementing videos. Using the CEWE PHOTOBOOK software a consumer can select scenes (frames) of the video and have it printed together with a QR code in the product. After receiving the product, the QR code can be scanned with any smartphone or tablet and the movie will be displayed on the mobile device.

## 1 Introduction

High quality videos can be taken with nearly every camera, digital point and shoot cameras, DSLRs as well as smartphones. High quality means video with HD resolutions as well as high quality with respect to story-telling. These videos can be viewed on nearly every screen and easily shared via social networks. These videos are not linked to other personal data such as pictures, maps, text descriptions or any kind of tangible products.

Videos taken with a traditional camcorder are not good candidates for implementation. Videos taken with these devices are made with the intention to generate a movie. Videos taken by DSCs and smartphones are taken by chance and are in average blow one minute length. Particularly these videos cannot be combined with the current state-of-the-art story telling: printed photo books. We propose implementing user-defined pictures (scenes) out of the video implemented in the photo book to reach an even more compelling story as well as implementing the whole video via automatically generated QR codes printed in the photo book is described.

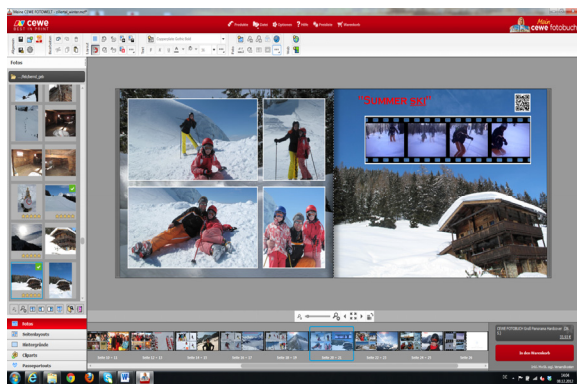


Figure 1: Frames of the video displayed in the editor

## 2 QR-Code technology

QR codes (for Quick Response), a decades-old technology that was first used in the supply chain, are now expanding aggressively into the marketing space. QR codes were first developed in Japan by the Denso-Wave Corporation for use in the automotive industry, and remained a b2b tool, not unlike RFID [1].

However, as of Q2 2011, QR scanning traffic was rising an astonishing 9840%, compared to the same quarter in the prior year [2].

Interpreting a QR code is a relatively straightforward process as well - assuming the information embedded in the code is simple and, preferably, text-based and can contain simply an URL. The QR technology is therefore often used to link directly to a website, but not to personalized content.

An analysis of QR Code sizes printed on demand and scanned with major smartphone models and tablets is shown in Figure 2. This is relevant in our case as the QR code “disturbs” the beauty of the product and shall be “invisible”, whereas in marketing it shall be seen and prompt the user to scan it. Figure 2 shows how we evaluated the smallest size possible to be printed in the photo book. We asked colleagues to scan small codes with their smartphones and tablets on four different surfaces of paper. So we got a nice set of currently used phones and QR code readers combined as a real “mirror” of the actual market.

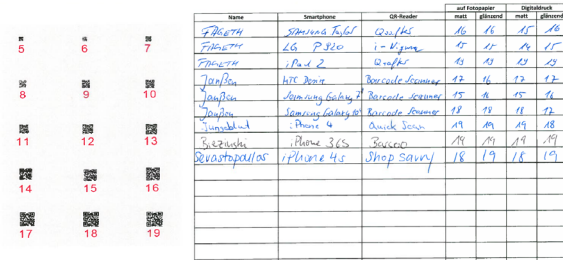


Figure 2: Evaluation of readable QR-Code sizes

This size is the fixed size of the code that will be printed in the real book. Again, this is different to the marketing approach in advertisements where the code is displayed really visible in order to push using the QR-code reader as illustrated in figure 3.

This paper was presented at the 4th International Symposium on Technologies for Digital Photo Fulfillment, held Jan. 6-7, 2013, at Bally's in Las Vegas, Nevada.

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ISSN: 2169-4672



Figure3: Advertisement including QR-Code

### 3 Implementing frames and QR Codes

The implementation is done via desktop based software to generate CEWE PHOTO BOOKS. Thanks to the proliferation of QR code campaigns by big brands, and improved smartphone technology, consumers are more aware of and more willing to use these 2-D barcodes and we do not have to introduce and explain the functionality to consumers. There are readers available for all major OS systems on smartphones and tablets, for Android the QR Barcode Scanner Pro claims, that the apps has been downloaded more than 10 million times [3].

#### 3.1 Selecting the printed frames

Videos are visible in the image selection area and marked as a film strip to be identified as a video. The video can be inserted on a photo book page identical to an image (drag and drop). After placing the video – represented initially by one frame- on a photo book page a double click on it opens a dialog to modify the display of video represented by frame(s). The user has two possibilities, either selecting up to 6 frames manually or let the system automatically select a user-defined number of frames.

We allow the implementation of most of the common video formats up to a length of 5 minutes. The maximum resolution accepted is HD. The original formats are transferred with the order to our servers.

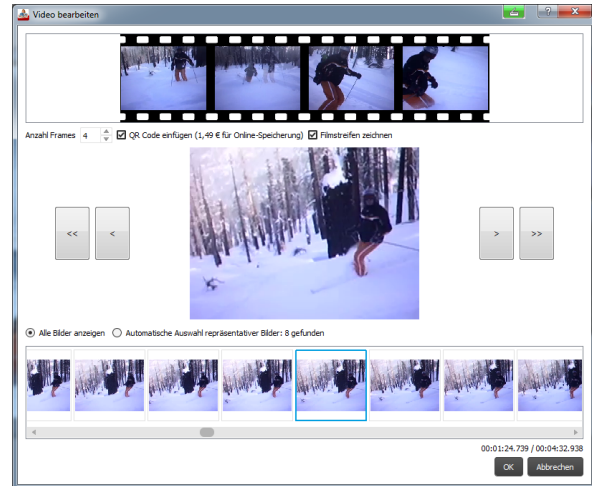


Figure 4: Selecting relevant frames of the video

#### 3.2 QR codes displayed and printed

The QR code displayed in the software is not the real link of the video that will be printed in the book. The displayed code links to a demonstration video that explains the usage when the user has received the printed book.

The code printed in the CEWE PHOTOBOOK links finally to the video stored in an online gallery. This code is automatically generated right before the printing process and contains the deep link referring to the video of the consumer. Size and position of the QR-Code selected by the consumer remains of course. This code then can be scanned and the video associated be viewed on any mobile device.



Figure 5: Scanning the QR code to view the video

The original video formats are all transferred to the common ACV/H264 codec, which can be displayed on nearly all devices. For further details to that codec and the legal implications please refer to, e.g. [4].

We store different sizes of the video for broadcasting, a smaller resolution and high resolution (HD), if the original video delivers that resolution. As a default we deliver the low res video, the user can actively switch to the HD video, if the bandwidth of the connection allows streaming that amount of data.

Figure 6 illustrates the size of the videos to be stored dependent on the number of frames per second and the associated bit rate.

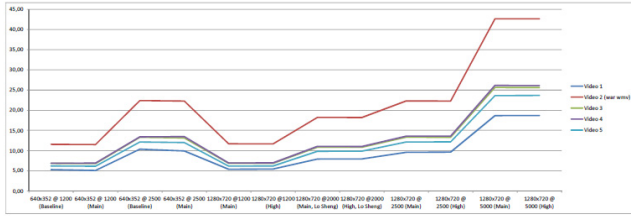


Figure 6: Storage requirement for the videos

## 4 Conclusions

Implementing scenes from videos in printed photo books allows real compelling and complete story telling. This approach allows the very first time a symbiosis or convergence of images and videos in a tangible product.

Due to the conversion of different input formats to the common H264 standard for display users do not have to take care about compatibility and get a real nice user experience.

We launched the service in Germany in December without any additional marketing in the software and get already a surprisingly high usage of that feature.

## References

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- [4] MPEG LA, [http://www.mpegla.com/main/programs/avc/Documents/AVC\\_Terms\\_Summary.pdf](http://www.mpegla.com/main/programs/avc/Documents/AVC_Terms_Summary.pdf)

## Author Biography

*Reiner Fageth received his diploma in Electronic Engineering from the University of Applied Science in Heilbronn, Germany (1990) and his Ph.D. in 1994 from the University of Northumbria at Newcastle, UK in the field of industrial image processing. Up to 1998 he worked with the Steinbeis Transferzentrum BMS on designing camera inspection systems for process automation mainly in the injection molding and bottling industry. He joined CEWE COLOR in 1998 and is since 2007 serving as CTO and Head of R&D.*