# Digital Cinema

## Defining the architecture of today's digital cinema

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**The paradigm shift in the film industry to enable digital distribution was a major and risky step to produce change in a century-old industry that required a universal, long-term digital cinema standard that meets the needs of exhibitors, studios, equipment manufacturers and others involved in this effort. The ITEA Digital Cinema project developed the key components for this transition of the movie industry from analogue 35mm film to digital technology. Within the project, a system solution was developed, covering all elements of film production, distribution, storage and replay, including alternative uses for digital infrastructure.**

## Impact highlights

- The results of the Digital Cinema project were integrated in the Barco Digital Projection product line and provided Barco with the basis for taking a leading position in 2012, with close to 30% market share that has continued growing since. Annual capture rates of around 50% have strengthened Barco's number 1 position, and with over 80,000 projectors deployed, Barco now has a global market share of close to 50% with annual revenues in excess of 300m euros.
- Barco achieved a #1 worldwide position with overwhelming market shares in China and Latin America of 60% and higher, a leading position in Europe with around 40% of market shares and a strong position in US and the rest of the world with market shares varying between 25% and 35%.
- In Barco, more than 350 additional people were hired to cope with the demand created by digital cinema. While Barco had previously built up to 100 (other purpose) projectors every month, thanks to the results of digital projection, the production including the digital projectors is now over 660 units per month. With peaks to 1,500 digital projectors per month, more people are required in the plant.
- XDC, a spin-off from project partner EVS, grew from 20 to 70 people between 2005 and 2011. It installed more than 1000 playback servers all over Europe and 200 central control systems in multiplexes, both fully derived from the architecture and technologies designed and developed during the Digital Cinema project.

## Project results

During the Digital Cinema project, the consortium studied the complete digital cinema chain including production, content mastering, colour management, compression, data storage, security, multilingual sound, subtitling and alternative uses for digital theatres. The main innovation in this project centred on projectors, communicator software, alternative content interfaces and internally overlaying subtitling.

These technological developments paved the way for a new generation of film distribution. Now, as a result of the project, with digital cinema, we can all watch movies with a much better image quality, wherever and whenever the movie is watched. Smaller cinemas can have access to movies of the same quality. Moreover, the new system developed during the project enabled 3D movies to achieve commercial success. Besides, movies can now be released all over the world at the same time.

In addition, digital cinema also supports services such as streaming live shows (music, sport events) or company presentations, which enables theatres to be operational outside the usual movie projection time slots. All this had not been possible with the previous 35 mm technology. Digital cinema has made distribution much cheaper and deploys technologies such as hard drives and satellite streaming. This technological switch represented a significant saving for the studios and triggered a new value chain and new business models for the sector.

## Exploitation

The results of the project were integrated in the Barco Digital Projection product line; the company was able to develop a Digital Cinema product family ranging from the first DP30 to the DP100 projector, which was Barco's first 2K digital projector to support the Digital Cinema Initiatives (DCI) standard drafted at the time. Barco is now moving to a new generation of projectors based on laser and laser phosphor technology, which is beneficial as the new technology is 40% more energy efficient and eliminates the need for xenon and conventional bulbs, the latter containing toxic components and requiring frequent replacement.

EVS brought Mpeg-2 playback server expertise, from its small EVS Digital Cinema cell inside the bigger slow-motion TV company. This cell started from a few persons. The success of digital cinema playback server was so good that EVS created a spin-off fully dedicated to Digital Cinema in 2005, called XDC.

The business success of the Digital Cinema project was such that some partners merged after the completion of the project to better access the market: Octalis was acquired by Technicolor and Barco decided to acquire the whole R&D, products and technology of XDC in 2011, with the ambition to further integrate the external Digital Cinema server inside the projector. This acquisition was a huge success with today more than 20.000 integrated playback servers inside Barco projectors worldwide.

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**PROJECT LEADER**

Dirk Maes, Barco

**PROJECT START**

June 2001

**PROJECT END**

July 2003

**PROJECT WEBSITE**

https://itea4.org/project/digital-cinema.html

**PARTNERS**

*Belgium*

- Barco N.V. ◉
- EVS Digital Cinema ⊙
- Octalis S.A. ⊙

*Finland*

- Sublime Software ⊙

*Germany*

- Kinoton GmbH ⊙

*The Netherlands*

- Philips ◉
- Stage Accompany ⊙

*United Kingdom*

- Computer Film Company ◉
- University of Derby ◉



◉ (Large) Industry ○ Research institute ⊙ SME ◉ University ● Government