

Project Results

Blu-ray 3D quality broadcasts Mastering the complete end-to-end transmission chain

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Consumers will only buy 3D TV if there is sufficient 3D content and producers will only create 3D content if there is a sufficiently profitable market – a Catch-22 situation. The JEDI project set out to resolve this situation and ‘broker’ the apparent impasse by creating the conditions that allow European partners throughout the 3DTV value chain to fully understand market evolution and user expectation so they can better prepare the right products in good time. The results of the project reveal that this goal was not only achieved but that the impact of these results will give European industry competitiveness in this domain a significant boost.

3D brings us closer to our day-to-day real-life experience, enabling the viewer to become immersed, as it were, in a more emotive experience. It is a new dimension in re-creating the visual of what one can see. The challenges to providing this experience depend not only on the quality of the technology but also on other aspects: about 25% of users do not really appreciate 3D since about 15% see it in poor quality, 5-7% of people do not even see the 3D effect and, on top of that, visualising 3D content is itself problematic. Until these issues are fully resolved, 2D and 3D content are likely to continue co-existing for the foreseeable future at least.

MASTERING THE CHAIN

The goal of mastering the complete end-to-end transmission chain, which is key to achieving the Blu-ray 3D quality at broadcast, was accomplished through more than 20 new products and solutions over the value chain, a 3D Lab and subjective assessment along with more than 30 exploitation cases. An experimental end-to-end workflow from capture to TV, enabling Blu-ray 3D quality at broadcast and using a user-centric approach, complemented the technological and business orientation of the project.

A coherent and proactive project consortium comprising members from Belgium, France and

Spain collaborated and cooperated closely in a process enhanced and supported by open and rich cooperation. Equally importantly, the good standardisation and dissemination drove both the partners and the community right to the edge of the state of the art in a very challenging timeframe. Despite the fast-moving scenarios and market conditions, JEDI kept ahead of the game to ensure broadcasts of Blu-ray 3D quality and a mastery of the complete end-to-end transmission chain.

The world-premiere transmission of “Service Compatible” 3DTV in June 2012, specified two weeks earlier by DVB and the presence of JEDI demo at IBC 2012 proves the above.

SHAPING AND DEMONSTRATING THE INNOVATION

The innovation was shaped through five work packages. The first WP targeted understanding how the various aspects of a 3DTV ecosystem are likely to develop over the near term and consequently define the requirements, use cases, system architecture and business models. This generated valuable and relevant business models for six key use cases. The second WP focused on implementing the system platform architecture specified in WP1 to deliver 3D content from acquisition through preparation to distribution of content. A vital WP was the third in which user experience plays a key role in the technical rendering of the 3D experience. The insights gained in these first three work packages provided the basis for an “end-to-end” chain concept demonstrator to enable user acceptance and quality of experience to be studied in WP4. Finally, the establishment of a dedicated management and organisation structure ensured that the development of relevant external technologies and standardisation activities could be actively monitored and a clear route to exploitation and project result dissemination defined.

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Partners

Alcatel-Lucent
Barco
D4D Ingenieria Visual
HISPASAT
NDS now part of Cisco
NXP
Pace
Philips
SAPEC
Technicolor
Telefonica Servicios Audiovisuales
Telenet
Thomson Video Networks
Trinnov Audio
Universidad Politecnica Madrid
Universidad Zaragoza
Universit  de Nantes
VideoHouse
Vitec
VRT

Countries involved

Belgium
France
Spain

Project start

May 2010

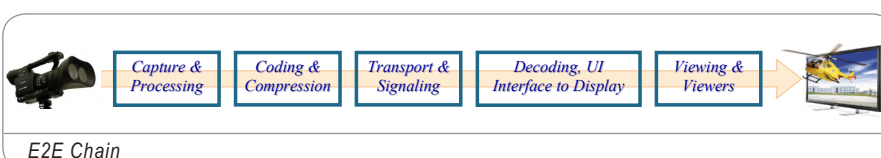
Project end

June 2012

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Project Results

Satellite channel demo, insertion and metadata management were three demonstrators selected to physically demonstrate the end-to-end chain, graphics and quality respectively. These were complemented by four other demonstrators focused on content shaping and pre-processing with conversion to specific 3D screen, video quality assessment to evaluate the JEDI technology, and audio supervision geared to correct localisation and an enlarged listening area.

INDUSTRY AND CONSUMER BENEFITS

It could be said that the JEDI consortium partners are 'surfing' at the edge of the state of the art and already implementing these technologies ahead of the others. In terms of advancing the technological innovation, JEDI is probably six months ahead of its competitors.

The JEDI project innovations have led to an improved 3DTV roadmap rollout and additional financing for 3D movies and 3D live broadcasting will give TV manufacturers new opportunities to sell TVs with added value and renew existing stocks. JEDI partners have gained considerably from the experiences shared during the project and, in terms of exploitation, they have introduced DVB Phase 1 in their commercial products throughout the value chain and are experimenting with prototypes prepared for DVB Phase 2. For example, Sapec & Thomson VN for their encoders, Vitec for their 2D to 3D conversion, NDS for User Interface, Pace for STB, Philips for TV and NXP for HDMI and Display Port ICs.

In this highly competitive market, European partners can benefit from leveraging on existing technologies and infrastructures. Industrial partners are able to propose identified and

evaluated solutions to their consumers, with further research and investigations by JEDI's academic partners. In turn, this will boost market growth, consumers will benefit from the interoperability and better quality of experience, and DVB improvements and implementation will put Europe at the edge of the state of the art worldwide. The results of the project will also serve as a basis for further R&D in the domain: improved user viewing comfort, assessment of 3D exposure over longer periods of time, 3D techniques in more use cases, like 2D to 3D conversion.

A PROMISING FUTURE

Glassless viewing technology is certainly one of the key factors for definite acceptance of 3DTV. The coming years will certainly see several generations of 3DTV workflow. A higher frame rate and higher resolution, even in 2D, will generate excellent 3D impression and comfort while the 2D and the 3D experience will be enhanced by UltraHD and HEVC. The impact of this will be much more widespread acceptance, viewing comfort (ultimately without the need for special glasses) and augmented reality.

With consumers willing to buy a product that enhances their viewing experience, comfortably, affordably and with extensive choice of content, producers will create the 3D content the market demands. The innovations developed in the JEDI project will 'broker' these ends of the chain by enabling European partners throughout the 3DTV value chain to fully understand market evolution and user expectation so that the consumer gets the products he wants. Ultimately, European industry will gain a competitive boost in a fierce global market.

Major project outcomes

DISSEMINATION

- 20 publications
- 25 presentations at conferences/fairs
- 12 JEDI demos in International fairs such as IBC, Broadcast IT, Dimension 3
- JEDI experimental satellite channel over Europe
- Common Workshop with 4 other projects dealing with 3D

EXPLOITATION

- More than 15 new products
- 5 new services
- 2 new systems

STANDARDISATION

- 6 contributions to standardisation bodies

PATENTS

- 4 patent applications filed and published
- 1 patent application in preparation

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■ ITEA 2 – Information Technology for European Advancement – is Europe's premier co-operative R&D programme driving pre-competitive research on embedded and distributed software-intensive systems and services.

As a EUREKA strategic Cluster, we support co-ordinated national funding submissions and provide the link between those who provide finance, technology and software engineering. Our aim is to mobilise a total of 20,000 person-years over the full eight-year period of our programme from 2006 to 2013.

■ ITEA 2-labelled projects are industry-driven initiatives building vital middleware and preparing standards to lay the foundations for the next generation of products, systems, appliances and services. Our programme results in real product innovation that boosts European competitiveness in a wide range of industries. Specifically, we play a key role in crucial application domains where software dominates, such as aerospace, automotive, consumer electronics, healthcare/medical systems and telecommunications.

■ ITEA 2 projects involve complementary R&D from at least two companies in two countries. We issue annual Calls for Projects, evaluate projects and help bring research partners together. Our projects are open to partners from large industrial companies and small and medium-sized enterprises (SMEs) as well as public research institutes and universities.



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