

## VISUAL RADIO PRODUCTION FOR SPORT EVENTS

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### ABSTRACT

Most modern radio receiving devices but also cars, smartphones include a colour screen and integrate digital, hybrid or web radio. With these features, pictures can be transmitted alongside the audio.

EBU/Eurovision has added visualisation for the live sports events it covers.. The content provided consists of an international signal with live sport results, photos from the events and quotes that broadcasters can use on their radio or web platforms. Many broadcasters have distributed the signal either on DAB/DAB+<sup>1</sup> or RadioDNS<sup>2</sup> or embedded the slideshow in their website. In this paper, we describe briefly how the project for sports was set in place, the workflow and how it has been distributed and used. A platform was developed that automatically ingest, process the content and produce the slides. We explore also the future possibilities for this new kind of media and how analytics could be used.

### BACKGROUND

Sport coverage on radio is popular, but has specific requirements: people do other things while listening to radio, so any enhancements to the audio experience must respect this. Visual Radio allows to transmit pictures alongside the audio.. However, there's a clear distinction from video content: this visualisation is not meant for watching but for occasional glancing and generally the slides stays for 10-20 seconds and can be repeated.

Producing images is new for radio but we can already see radio stations providing CD covers, illustrations of the show that is on air or sometimes non program associated information such as weather, general road traffic status, etc.

Eurovision is already covering many sport events for television thanks to the partnership they have with many sport federations. So came the idea to explore possibilities for radio.

After a first test on Swimming championship in Barcelona with some EBU broadcasters in 2013, a real world live coverage was provided on European Championships in Zurich in 2014 and also for Skiing Championships in Vail in 2015.

The challenge is to produce content in an easy and low cost way because broadcasters cannot afford growing their production team for these visual elements.

### GLOBAL INFRASTRUCTURE

Figure 1 shows the big picture of the workflow and infrastructure put in place.

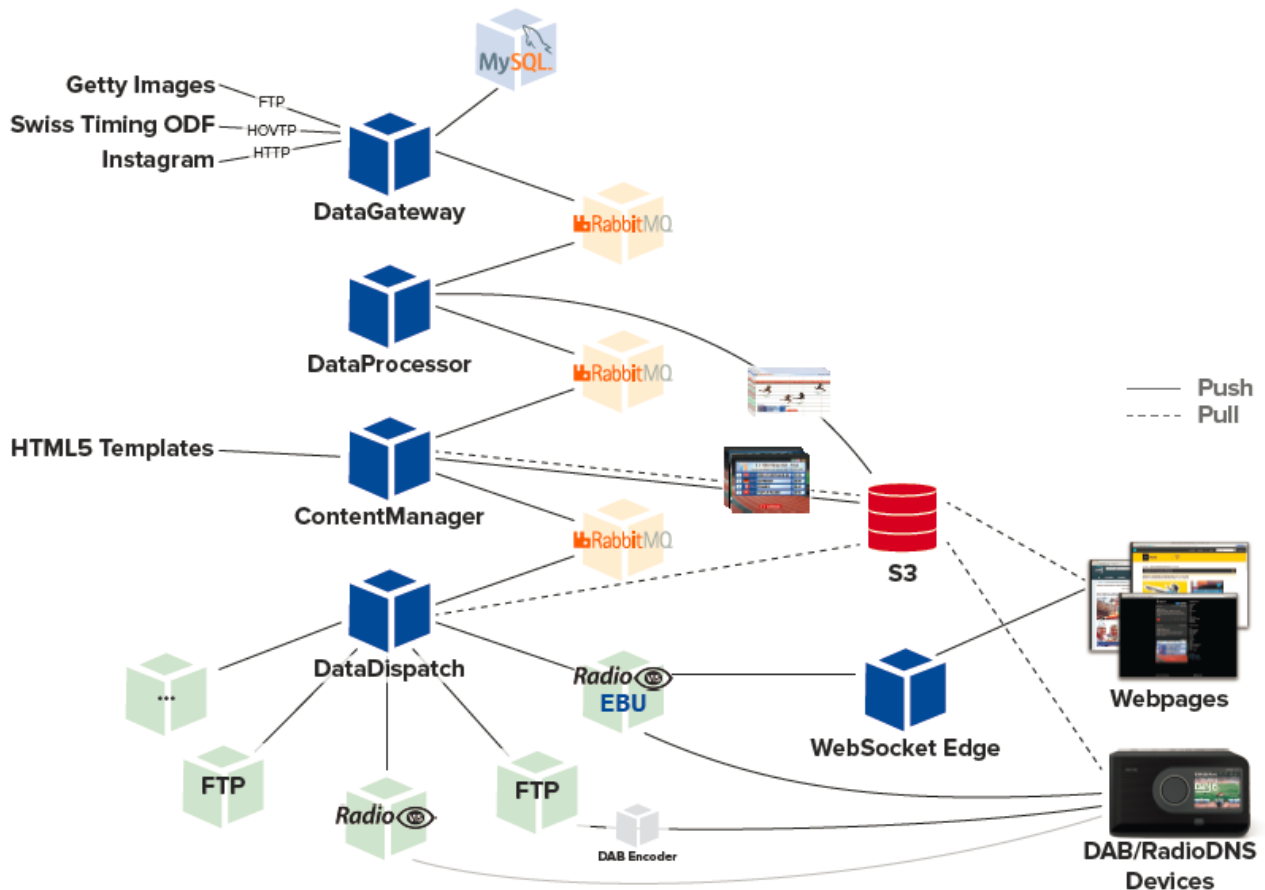


Figure 1 – Global infrastructure from ingest to delivery

Here's a brief description of the functional elements of the workflow:

- Data Gateway: This is the content ingest, receiving the information sources and storing the data in a database.
- Data Processor: This block is in charge of processing ingested content to filter and extract the data and prepare them for production
- Content Manager: this is the actual slides production platform running on the workstation of the person controlling the visual production. It receives pre-processed data that it applies in slides templates. The output of the content manager is images in various format.
- Data Dispatch: delivery of the produced content on the different platforms of the participating broadcasters. DAB slideshow, RadioDNS/RadioVIS
  - WebSocket Edge: this elements translates RadioDNS/RadioVIS for the use on web widgets to be integrated in webpages of broadcasters.

All these elements consist of instances on Amazon Cloud Service and are connected using RabbitMQ open messaging communication. This choice was motivated by the time and budget constraint of the project and the greater flexibility offered by this kind of platform. For example the content manager instance could be run from various locations depending on the time of the day.

## **CONTENT INGEST AND PROCESSING**

### **Sport data**

All sport events have organisations in charge of the timing and results management. Swisstiming is one of the major companies providing timing information. They accepted to make a partnership on this project by providing live raw data during the event covered.

These data consist of name of competition going on, athletes ID, intermediate and final times, global result lists with lots of other information, all this sent as text via FTP. Standards exist for some sports such as the Olympic Data Feed (ODF) that is a XML format defined for athletics and that was used for the case of Athletics Championships in Zürich in 2014.

For sports like skiing or swimming, these data can be processed in a linear way as competitions happen but for athletics, many competitions happens at the same time and care must be taken to filter out the data.

This was the difficult part of the project to handle the data, extract information, map it to the correct athletes and completion, manage the exceptions or errors to avoid wrong or incomplete results to be displayed.

### **Images**

Photographers and companies such as Getty images are present on the competitions. They were able to provide near-live pictures of competitions, sending images via FTP.

A large number of images is generated and, in the case of athletics, correspond to different simultaneous competitions. This was the task of the operator on the Content Manager that can check incoming pictures and select the ones to be displayed and if necessary add titles or comments.

The source could also be Instagram accounts.

### **Other information**

Other source of information includes twitter feed or text directly entered by the operator on the Content Manager.

## **CONTENT PRODUCTION**

The content production is the actual creation of the slides. Due to the absence of scalable software for this application, EBU started to write the Content Manager, an open source software that can be adapted for producing visuals. Many operations can be automated as data arrives, results slide are generated less than a second after sport data flowed in. However, the presence of an operator is advised to make a final check, influence the visualisation, select best pictures and enrich the content with text related to the competition.

Slides are generated in a carousel and so are repeated until newer information arrives. The slide repetition is advised because this content is not watched permanently by listeners so in the case they missed to read a slide, they have another opportunity to see it. The frequency of slides has been chosen to be 15 seconds per slides but the operator can decide to sneak in slides.

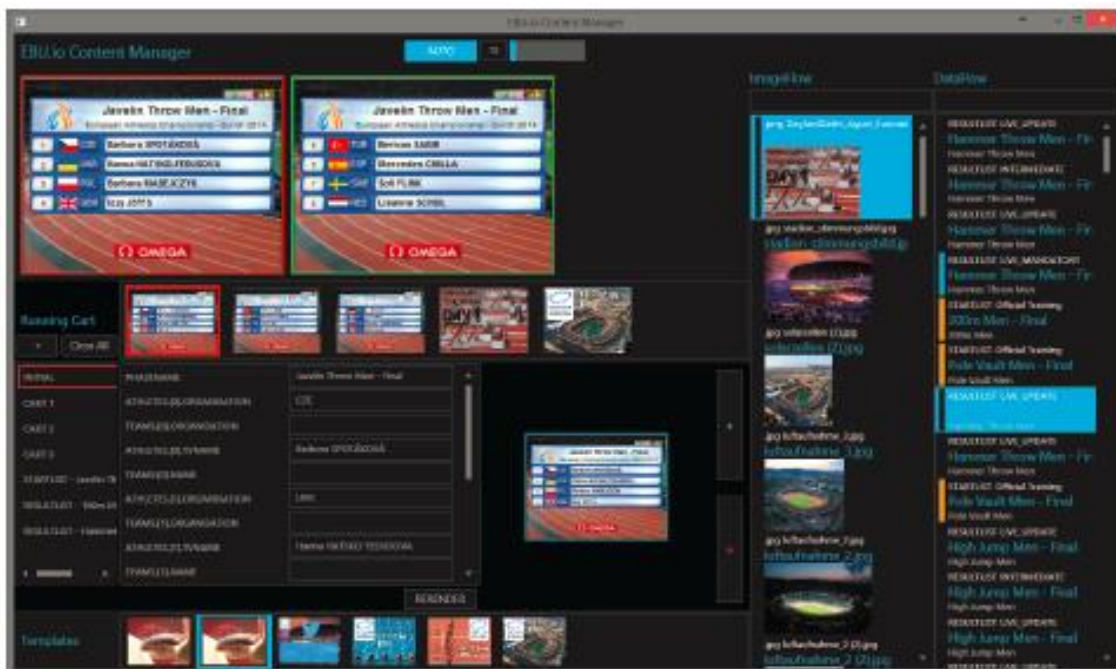


Figure 2 – Snapshot of the Content Manager

The EBU Content Manager is running on windows and is publically available in open source on the EBU.io platform<sup>3</sup>.

- On the top the slide that is on air, the preview slide can be seen
- Under the preview/live slides, the current carrousel of slides can seen and just below the metadata of the current slide that can be adjusted.
- On the bottom of the page, the operator can decide to apply different slide templates.
- The two right frames are the feed of images available and the feed of sport results, they are updated as newer content arrives.

The EBU Content Manager render the final image by applying different layers and predefined templates. The templates are created using HTML5 format. This has the advantage to be scalable to size of the image generated. The default image format for delivery platforms is 320x240 pixels slides but for bigger screens higher resolutions can be generated.

This software is not turnkey product but is meant to be a scalable platform that can be adapted by developers to the need of the sport competition or other live events.

It could be reused by manufacturers of radio platforms for example. The objective of EBU Technology&Innovation is to promote the rollout of visual radio and help broadcasters to start new services.

## DISTRIBUTION

Many broadcasters have been involved and also with many different distribution platforms. The following distribution options were offered to participating broadcasters:

- DAB/DAB+ Slideshow. In this case, images were delivered via FTP to the DAB headends of operators or to the broadcaster if it needed to be integrated into an existing visual radio flow.
- RadioVIS Hybrid Radio on FM or DAB, this RadioDNS service uses Streaming Text Oriented Messaging Protocol (STOMP). Broadcasters using this option were generally using the RadioDNS/RadioVIS free service offered by EBU but it could also have been delivered to a third party RadioDNS servers.
- Web integration. This is the widget for integration into existing website from broadcasters. It was integrated on the page of the related event or front page. Two options were offered here, either the integration of a Javascript component or the integration of an HTML iframe. The Javascript component is also available as open source on the ebu.io platform.

## RESULTS

### Slides

On Figure 3 and Figure 4 are some examples of slides generated.

Care must be taken not to overcharge slides with text or results due to the limited resolution and screen size used in receiving end.



Figure 3 – Slide examples of Athletics Championships in Zürich 2014



Figure 4 – Slide examples of Alpine Ski Championship in Vail 2015

## Statistics

For the Zurich Athletics Championships that happened during 6 days in August 2014, around 24.3 thousands message have been processed, leading to 4.2 thousands images produced and 4.3 million images distributed (for the web players mainly, not taking into account DAB Slideshow broadcast delivery that cannot be measured). This is quite high considering that 11 public broadcasters participated (+ other smaller broadcasters).

## Feedback

Most broadcasters have used the slides directly and didn't add them in an existing workflow. So in many case they were distributed even when the station was not live on the event making it like a non-program associated data information feed. For one broadcaster, there was the issue of integrating this set of slides in an existing visual radio production workflow in their organisation and he couldn't finally participate for this reason.

Broadcasters using the slides on DAB Slideshow had sometimes issue with the rate of production, if the bitrate allocated to DAB slideshow was not high enough. Then some slides were dropped. In the future, a prioritisation of slides could help broadcasters with lower bitrate to select which slides to keep or drop.

It is interesting to note that for Skiing Championship in Vail, the results were displayed on the web and hybrid radio platforms, up to 8 seconds before race was finished on TV.

## FUTURE

Many things can be improved for future experiences, in particular, regarding the prioritization of slides. DAB & Hybrid Radio Categorized Slideshow would allow receiver to cache the content for easily going back or get the latest results doing simple operations.

The web widget was also a new interesting use of visual radio and could be used as banners to glance at when following a sport event while doing something else.

The web player has already been adapted for the Apple watch and could be used as new way to disseminate immediate results for future events.



Figure 5 – Live slideshow prototype for the Apple watch

## CONCLUSION

Producing images for radio is new for broadcasters. For a long time there was a chicken&egg problem between content available and platform displaying it and starting visualisation is a motivation to end this paradigm. At the very beginning in 2013, very few broadcasters were interested but since then the number of interested broadcasters has grown. Also more broadcasters have now visual delivery platform with DAB+ getting deployed in Europe and RadioDNS hybrid radio.

We have demonstrated that a new visual service for non-attention captive media such as radio can be attractive for sports and can be used on web platforms too. We have also shown that this can be done at limited costs and produced open tools that can be reused by broadcasters or manufacturers in an agile software collaboration way.

Visual radio data for sports could become a regular service from Eurovision but for some sports content rights issues must be solved. This approach can also be used for other live radio events such as live music concerts, news.

## REFERENCES

1. DAB Digital Audio Broadcasting. ETSI EN 300 401 (Core DAB specification) and ETSI TS 102 56 (DAB+)
2. ETSI Technical Standard TS 103 270 – RadioDNS Hybrid Radio; Hybrid lookup for radio services  
ETSI Technical Standard TS 101 499 v3.1.1 – Hybrid Digital Radio (DAB, DRM, RadioDNS); SlideShow
3. <http://www.ebu.io> - A platform to enable Agile Collaboration

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