



Standards and the Future of Broadcasting

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DVB: We Create Standards



ATSC



DVB



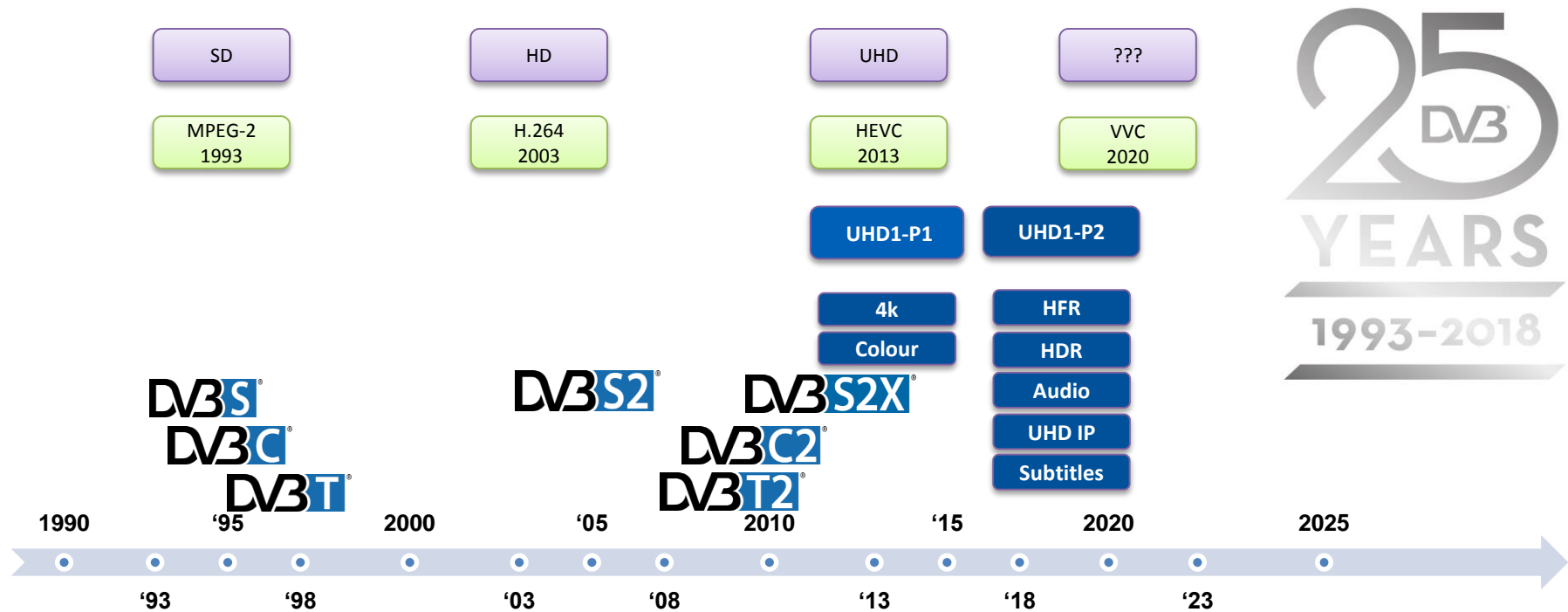
ARIB:
ISDB-T



DTMB



Digital Milestones for the Broadcast Industry



First Conclusion: Channel and Source Coding

- For the **single channel** we have no tools at hand to increase the **spectral efficiency**
- We can still expect one more **video codec** with significant performance gains
- New technologies will require more **powerful chip-sets**
- We may no longer rely on **Moore's Law!**

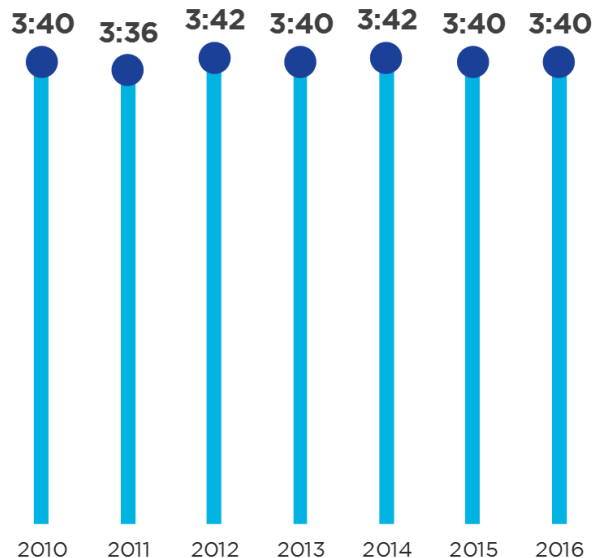


Future Trends

Daily TV Viewing Time

**Traditional
TV viewing
remains
stable
overall**

DAILY TV VIEWING TIME PER INDIVIDUAL: 2010-2016
AVERAGE BASED ON 46 EBU MARKETS (H:MM)



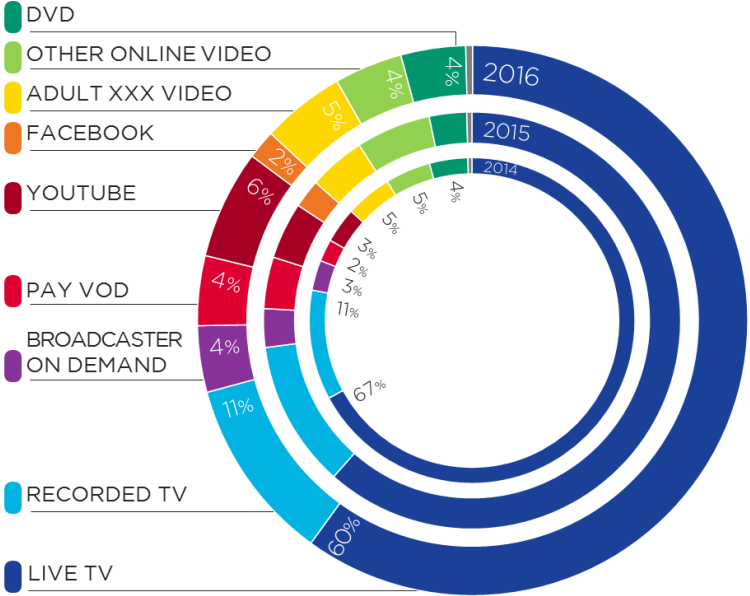
Source: EBU based on Eurodata TV Worldwide & relevant partners / EBU Members' data

Share of Total Viewing Time

Online viewing is progressively eating into TV viewing time

SHARE OF TOTAL VIEWING TIME

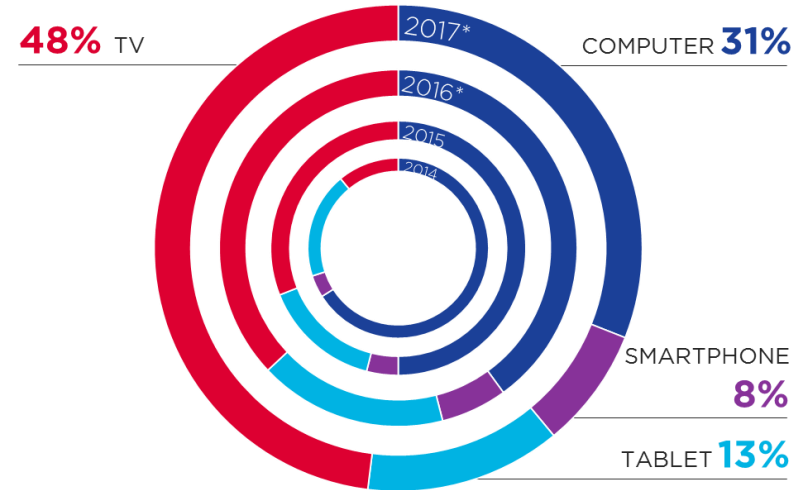
UK, ALL INDIVIDUALS



Minutes Delivered By Screen

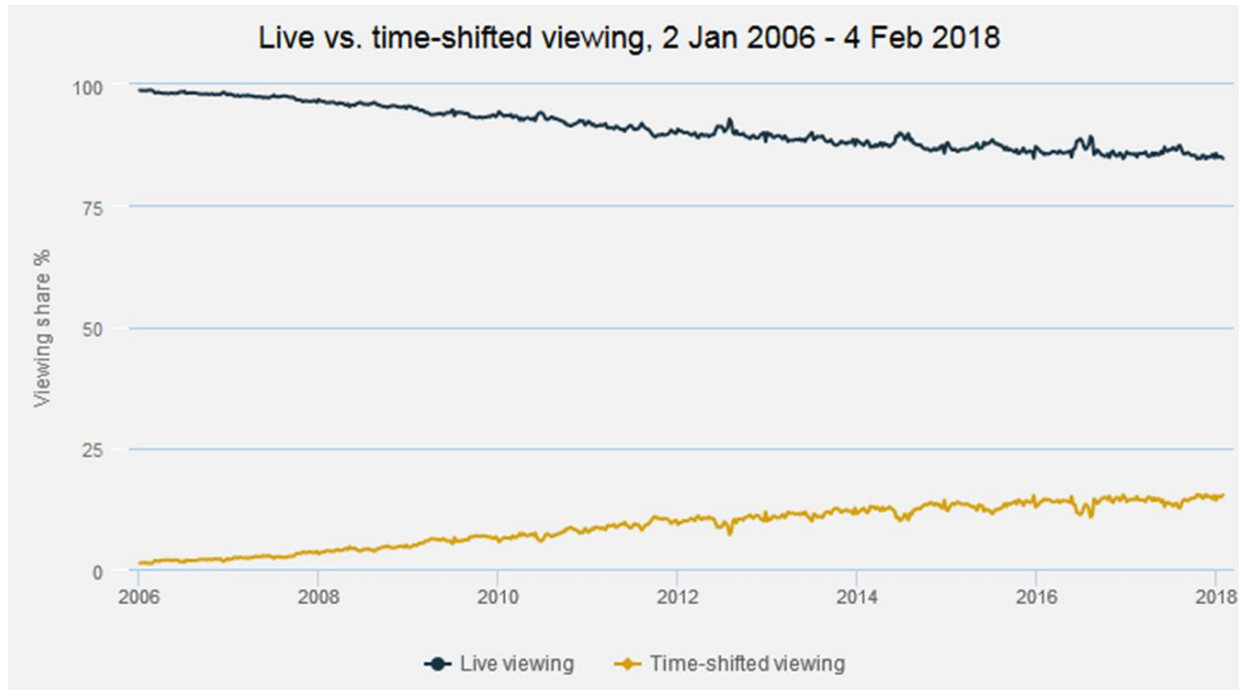
The TV set is becoming the main screen for streaming

NRK WEB TV
MINUTES DELIVERED BY SCREEN



* 2016 based on January - June, 2017 based on January - August
Source: NRK / Kantar TNS Scores, 2016

Live vs. Streaming Viewing - UK



Linearly extrapolating the current trend, the curves will intersect in 2036.

Cinema Decline



The radical decline of cinemas when TV entered the market

Figure 6–5. Weekly Motion Picture Attendance as a Percentage of Total US Population, 1922–2004

Source: The Rise and Fall of American Growth, Robert J. Gordon

Second Conclusion

- Broadcast TV will stay with us ...
- ... but user pattern and behaviour will change

- The transition to OTT is evolutionary and not revolutionary

- Broadcaster will have to adapt but are in a good position:
 - Trusted brand
 - Leading on-demand provider
 - Big screen still the first choice

- OTT and VOD service provider have to adapt:
 - Provide the same QoE as traditional broadcast TV
 - Address the big screen in the living room
 - Enable easy navigation for OTT services

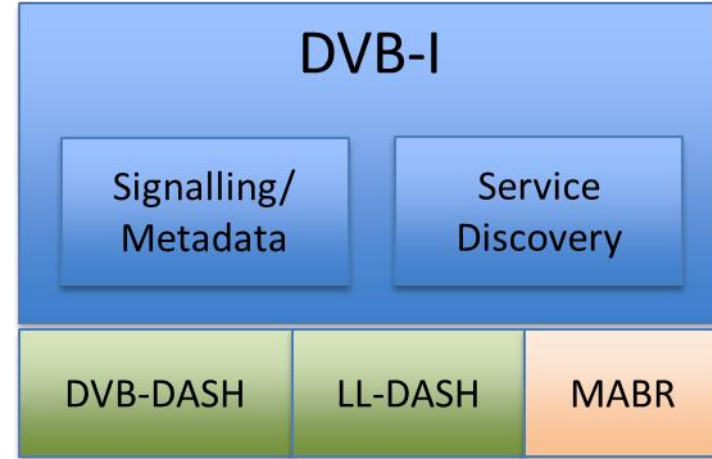
Broadcast Delivery via IP Networks

- "In the future all broadcast content will be delivered via IP"
(Peter MacAvock, DVB Chairman)
- But we are not there yet:
 - Broadband delivery not cost efficient as compared to classical broadcast
 - Limited broadband access in many countries
- OTT Challenges:
 - Scalability for Live Broadcast
 - Delay for broadband access
 - Discovery of broadband content
 - Market fragmentation for broadband solutions



New Initiative: DVB-I (Internet)

- DVB-I will bring the **convenience and QoE** of broadcast TV also to **OTT delivery**
- Foundation of a new system is built on:
 - DVB DASH
 - Low Latency DASH
 - Adaptive Media Streaming over IP Multicast
- DVB-I will provide **discovery, integration and distribution** capabilities for OTT services similar to DVB services distributed over T/S/C/IPTV





Consequences for Broadcast SDOs

The Paradigm of New Platforms for Broadcasters

- Rely on API, Cloud based Services (SaaS)
- Need for openFrameworks, Open API
- Agile, Continuous development
- Reference code, Libraries
- Software repository (GitHub)

Source: Matthias Coinchon, CTO RTS (French Swiss Public Broadcaster)

Broadcaster Wish List

- Broadcaster expect guidance from SDOs
- «Standardise and forget» doesn't work anymore
- Need for marketing, lobbying, regulation, networking, guidelines, business cases, prototypes, example code and libraries, etc
- More community work like Open Source development
- In a Software defined environment conformance testing becomes mission critical

Source: Matthias Coinchon, CTO RTS (French Swiss Public Broadcaster)

DVB Discussions on Conformance Testing

- **Test Cases:** Define test cases as part of the technical work
- **Test Vectors:** Based on the test cases, derive test sequences for receiver implementations
- **Client Reference Implementation:** Regarded as relevant to kick-start commercial deployment
- **Open Questions:** Who does the work? Who pays for the resources and infrastructure?

Personal Remarks (and Summary)

- I believe in Shannon, so there will be no big gains in spectral efficiency (for a single channel)
- I believe in coding technology progress, so there will be **one** more next-generation of video coding with half the data rate and the same performance
- I am convinced that there will be a future for broadcast in a hybrid, interactive broadcast/broadband architecture
- I believe that broadcast SDOs will play a role in this future but we have to change our mode of working
- I hope that everybody is now more aware of the Cambrian Explosion

We have started a new journey...join us!

