

**ITU-EBU Joint Workshop on Accessibility to  
Broadcasting and IPTV ACCESS for ALL  
(In cooperation with the EU project DTV4All)  
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# **Activities to Improve Accessibility to Broadcasting in Japan**

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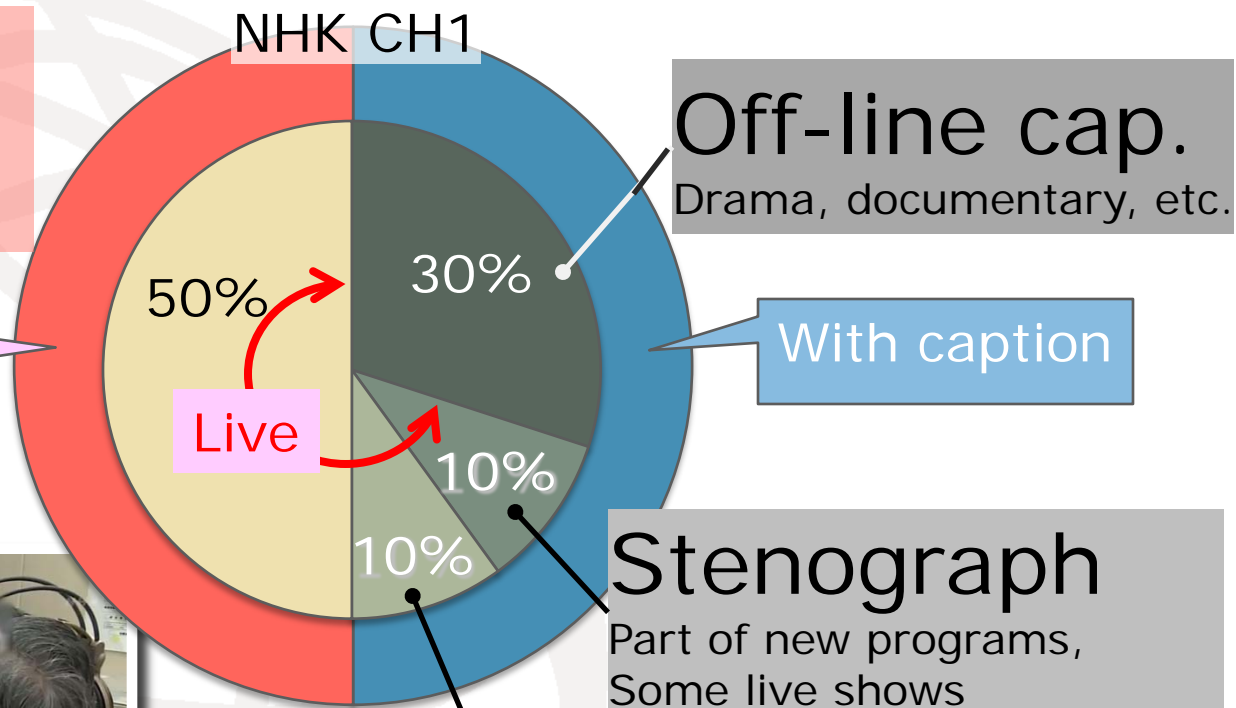
# Situation in Japan

- Digitalization of broadcasting(DB)
- More pressure for better accessibility to broadcasting
  - DB receiver has 4 audio, 2 closed caption
- Government set a target of services
  - 100 % programs for closed caption
  - 10 % programs for audio description
  - by the end of 2017

# Stats of Closed captioning

Target of Gov.  
100% programs  
by the end of 2017

Without caption



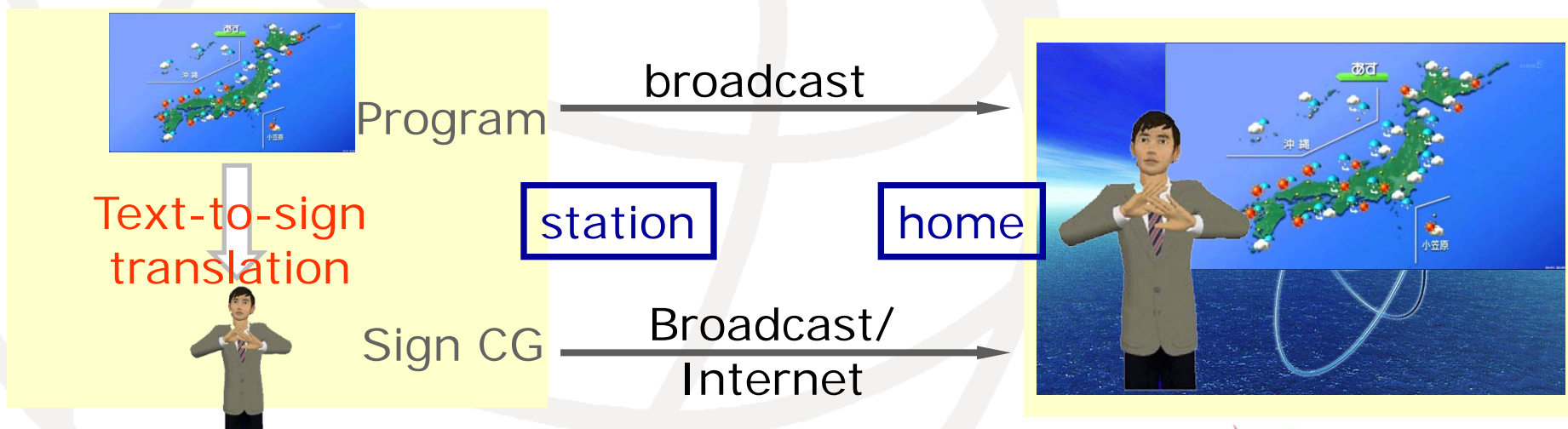
# News captioning system with speech recognition

- Recognize speech of announcer and reporter
- Recognize re-soken speech for interview
  - Captioning accuracy : 98 % for short news
  - Accuracy and operating efficiency increase
- Spontaneous speech is an issue to solve



# Japanese-to-Sign machine translation with CG avatar

- Deaf people claim sign language service rather than captioning but ...
  - ✓ Sign language interpreter is not easy to find.
  - ✓ Closed service is preferable.



# Audio description service for visually impaired people

- Audio description service (AD)  
7.6%(2009) → 10%(2017)
- AD is a kind of radio drama and man-power consuming to create.
- Assist system for writing script of AD
  - detects silent spaces, estimates word count, and adjusts length by speech rate conv.
  - proposes candidate phrases if electronic script of original program is available.

# Information barrier-free for the visually impaired



Text

Access to digital broadcasting



2D shape

Tactile display for GUI, shape, graph, etc



3D shape/tactile

Force feedback display

Tactile broadcasting

# Speech rate conv. for elderly

- Triggered by a letter “Announcers’ speech is too fast to understand.”
- Commercialized as TV, radio sets, and internet service



# Fast read-out for visually impaired people

- Needs for “fast hearing” of electronic text (internet, e-mail, e-book)
  - Developing a faster (2~4x) and more understandable conversion method
  - Daisy machine and software



Evaluation experiment



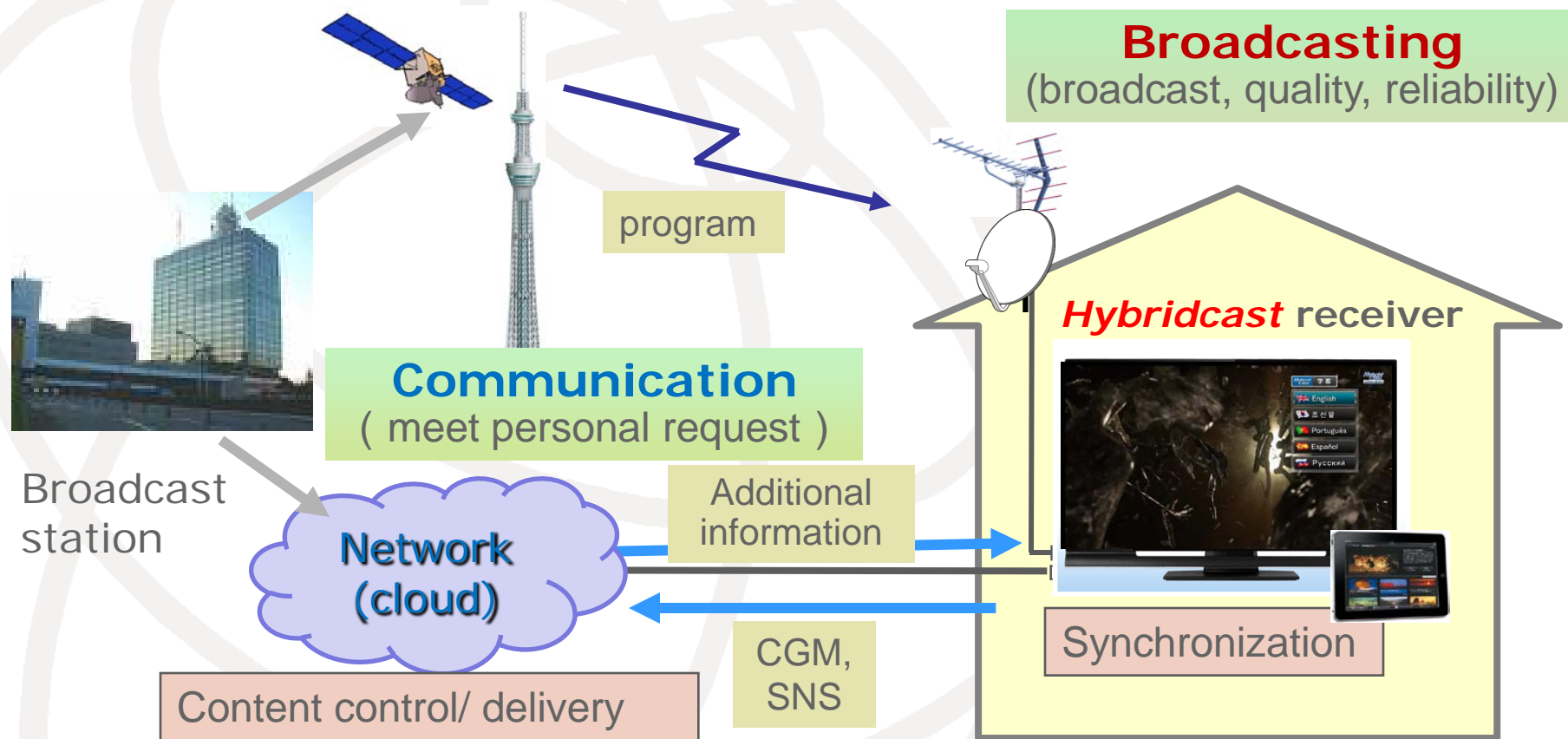
Experiment in Austria

# Needs to convey various information to the home

- To fulfill personal needs requires more bandwidth than digital broadcasting.
  - **HybridCast** is a new system that convey supplemental information through communication channel to enrich broadcasting programs.
  - Multi-lingual closed caption and closed sign service are typical examples.

# Hybridcast: concept and technology

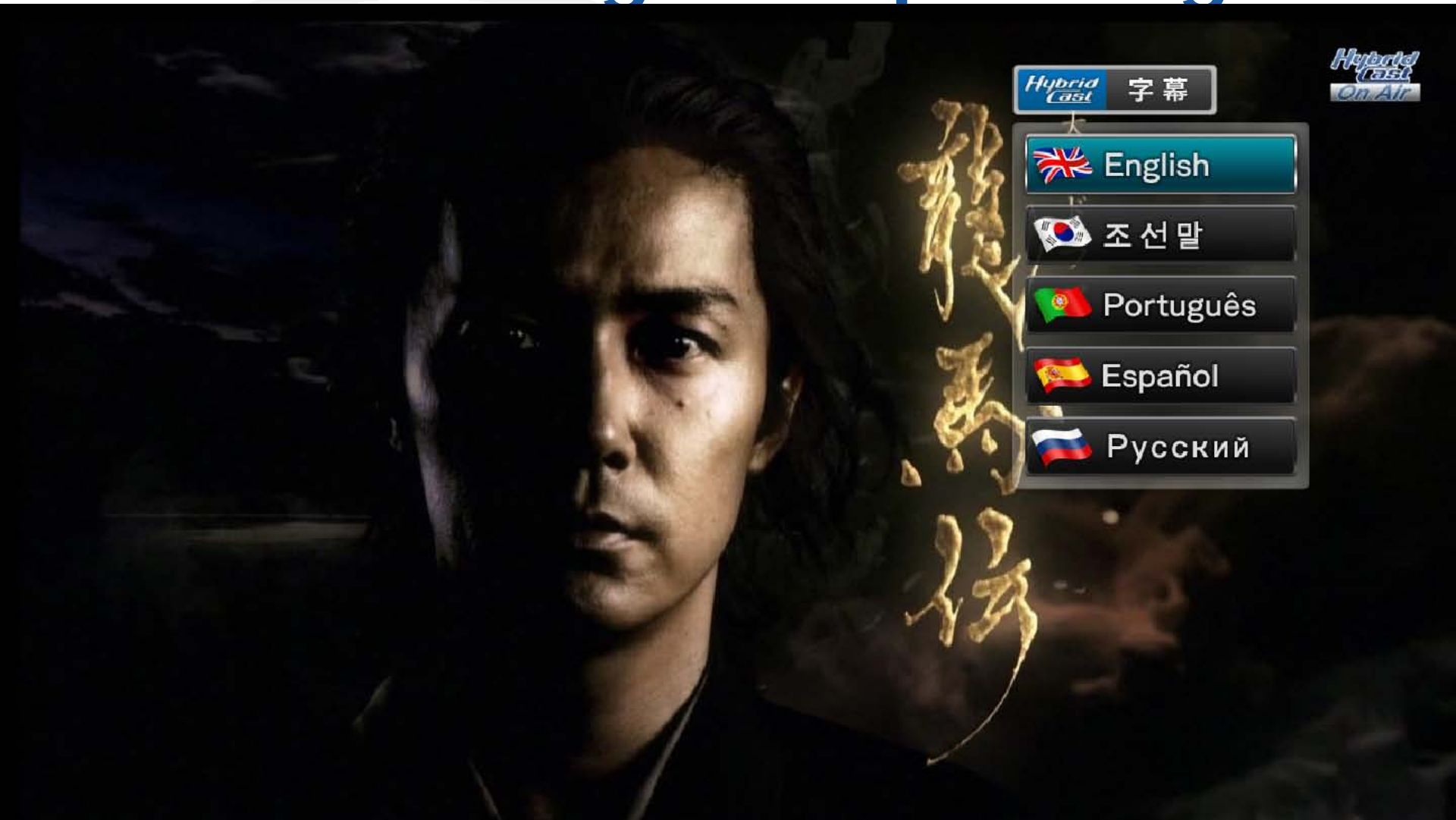
TV-centric hybrid system of broadcast and communication to enrich programs



# Hybridcast: slow speech service



# Hybridcast: Multi-lingual captioning



# Conclusion

- Technologies of commercializing level
  - Need a bridge over “the death valley”, a gap between R&D and commercialization.
  - Overcome the principle of economics
  - Reduce the operating cost
- Technologies of basic research level
  - Need efficient research
  - Sharing the results and research collaboration is important.

# For more info.



# Current status of NHK service

- Closed caption service: 52.8%
- Audio description service: 7.6%
- Sign language programs: 1 ~ 2%