

AI – *Quality* criteria
for DHH, mono-& multilingual subtitling needs



Hadmut Holken, Holken Consultants & Partners (France)



LeadMe Workshop at NEM Summit 2023

Zagreb, Croatia, 24-25 May 2023

State of the art – You said AV Subtitling?

- Generally speaking, communication is more and more done over video, frequently used with subtitles in a nomad context,
- Subtitling in media (markets) is very fragmented (100s of small companies and freelancers, few dominant media players), often regulated in the AV sector,
- E-Learning is more and more concerned, but uses “full-text-subtitling”,
- Communication & marketing departments – all economic sectors – produce more and more (short) videos.

But: Quality Subtitling is not just « re-transcription » of speech or text.

Essential:

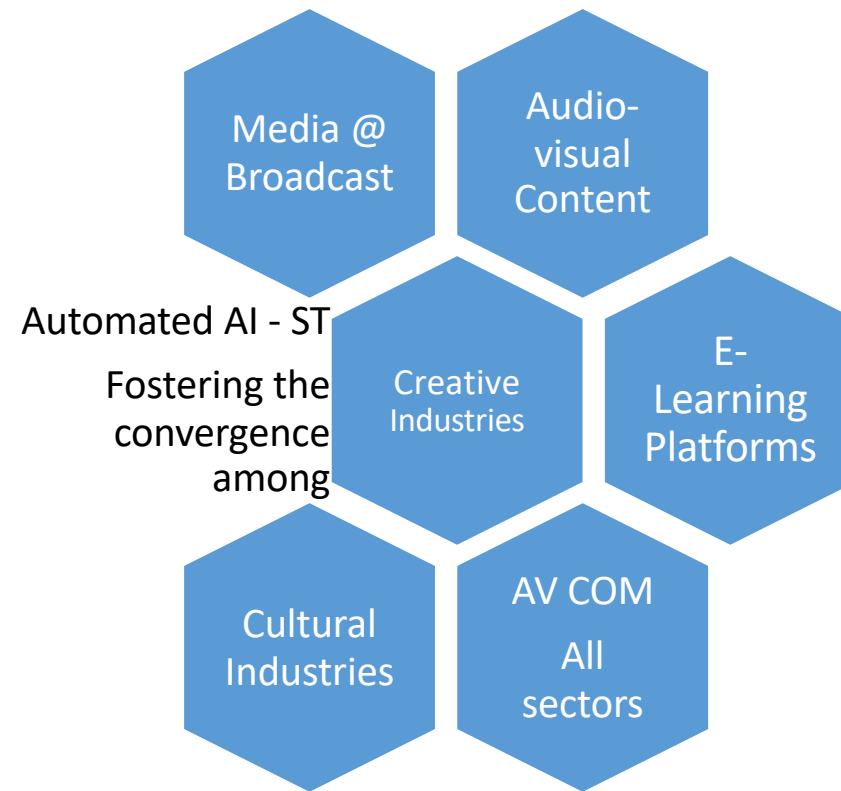
- Offer multilingual subtitling that fits the major actors needs
- Meet the expectations of the DHH
- Include live subtitling, while allowing cultural diffusion (not dilution)

These 3 main initiatives were already considered within the French PPP [ROSETTA](#)

Quality AI Subtitling: Needs & Potential Gains

Specific Needs	Expected Gains
<p>Case 1: Broadcasters</p> <ul style="list-style-type: none">• Due to European (and national) regulations, broadcasters have to produce and/or broadcast more and more subtitled programs with less means.• They expect industrial solutions that drastically reduce costs and produce high-quality subtitles that only human expertise can bring in today. <p>Expectations:</p> <ul style="list-style-type: none">• ensure that mono and multilingual subtitles keep carrying the full cultural dimensions, “the soul”, of original languages,• meet the quality needs for the deaf and hard of hearing.	<p>Subtitlers will gain:</p> <ul style="list-style-type: none">• 50% + in productivity,• Preserve/offer high quality subtitles and cultural dimensions.
<p>Case 2: E-learning platforms</p> <ul style="list-style-type: none">• Academia and companies need to reach as many people as possible. The generation of <i>quality</i> subtitles in the original and further languages will be a high value asset.• E-learning providers also need to monitor the quality and retain the intellectual property, including subtitles.	<p>Automated production of multilingual subtitles for e-learning videos allows the platforms to:</p> <ul style="list-style-type: none">• reach out to wider publics,• disseminate their video lessons not only in their own country and in Europe, but also across continents to a global audience.

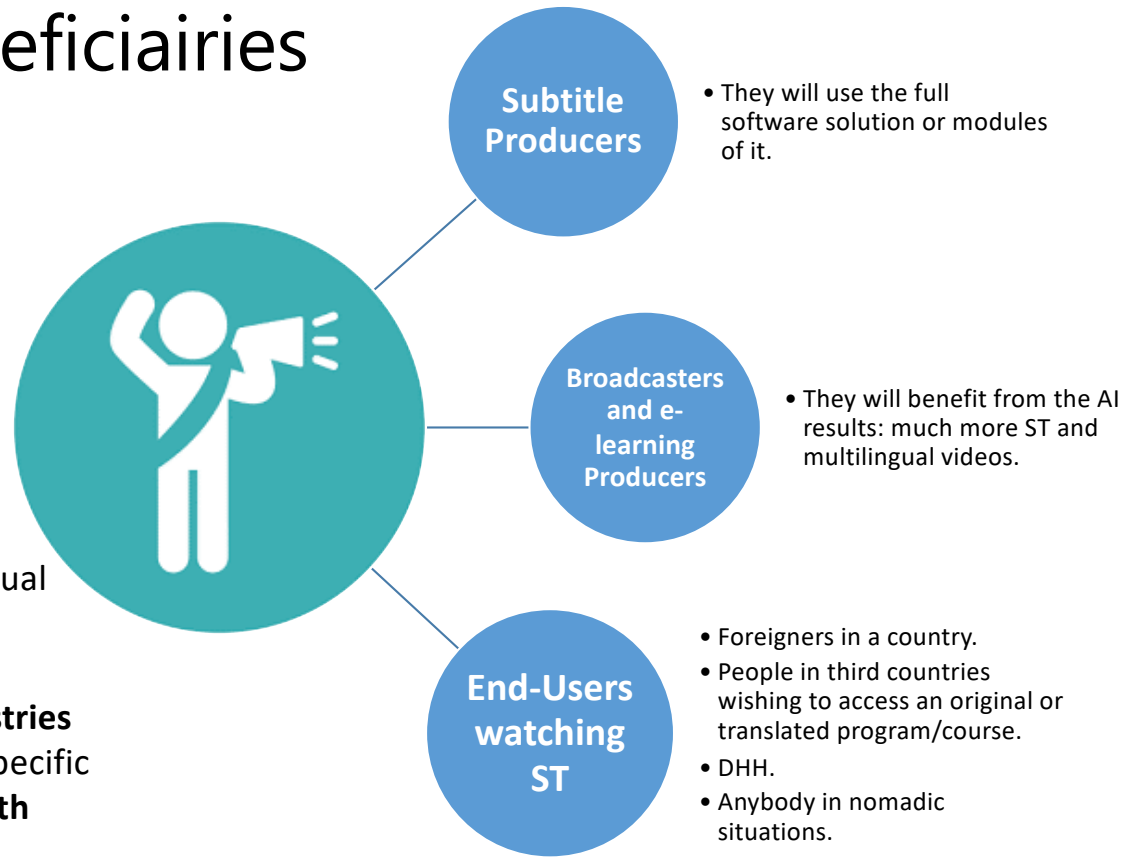
Concerned environments



Quality Subtitling is different from re-transcription of speech or text.

Target groups / beneficiarries

- Subtitling for DHH, and mono- and multilingual subtitling is essential for human beings information and learnings.
- Automatic quality subtitling for **media industries and beyond** will allow to address not only specific needs, but to **provoke large scale usages with multiple impacts.**



+ Scientific communities

Potential impact



Economic: increased ST efficiency, new markets for automated ST.

Societal: Cultural diffusion instead of cultural dilution

Social: Inclusion & diversity (quality ST considered according to the needs of the DHH + multilingualism).

+ Scientific discovery publications

AI Subtitling vs re-transcription

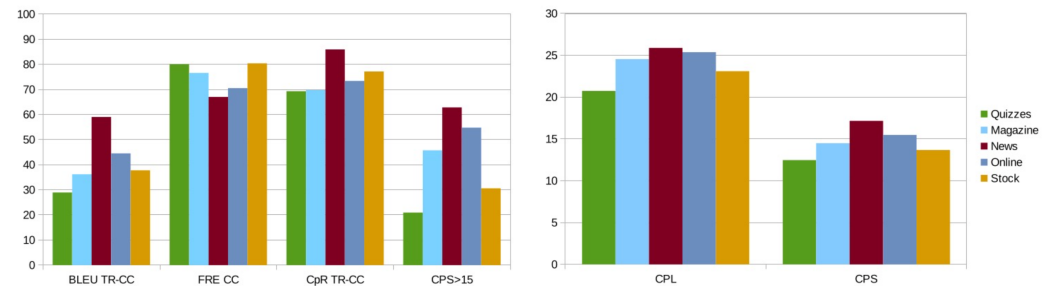
Subtitles must be EASY to read & synchronized with sound & images

→ Spatial and temporal constraints must be considered (and solved)

→ Variability of ST according to the different corpora (live, stocks)

→ There are still gaps for readability and understanding to be solved

Variabilité des sous-titres selon le genre dans le corpus



- les sous-titres en direct sont plus proches de la transcription (ex. journal),
- les sous-titres en stock sont moins denses (ex. jeu),
- des écarts pour la lisibilité et la compression également.

Source: ROSETTA Project

→ Some issues come close to the needs, others need more fundamental research, and thus more time.

GO beyond Automatic Subtitling

.... with complementary demands that include:

Automatic audio-description (text to speech):
Automated Sign Language (avatar generation) and its automatic subtitling in the original language and other languages .

→ These 3 main initiatives have been shared by the French PPP ROSETTA project

Build on ROSETTA results (1)



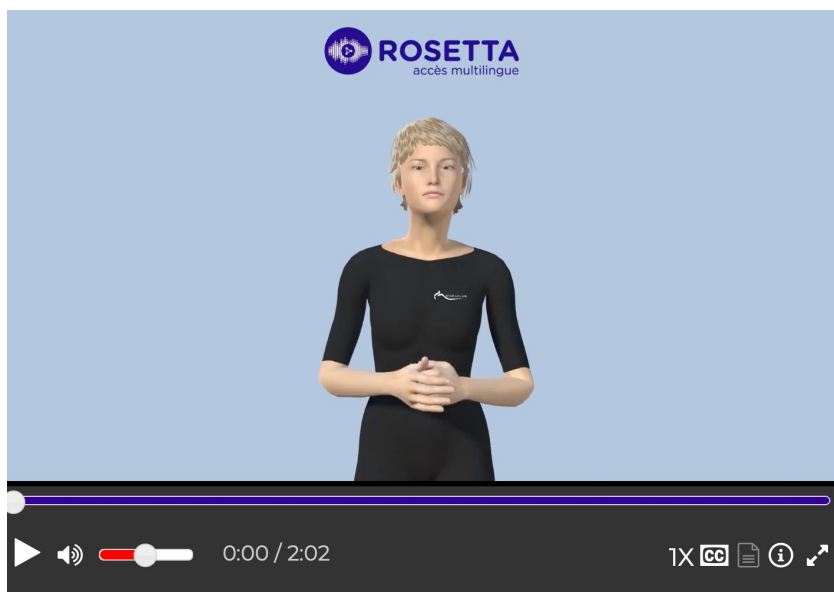
<https://rosettaccess.fr/index.php/home-page-english/>

Build on ROSETTA results (2)

Artificial intelligence (AI) and hyper-personalization (HP)

- General Background
 - TV is more connected with innovative and interactive services over broadcast and broadband networks.
- The project showed:
 - AI in general, and deep learning in particular, can guarantee that as many people as possible benefit from technological innovation in the TV industry
 - Give access to services, such as quality subtitling in a *contextualized* way.
 - Re-invent and develop the automation of sign language content production.

Build on ROSETTA results (3)



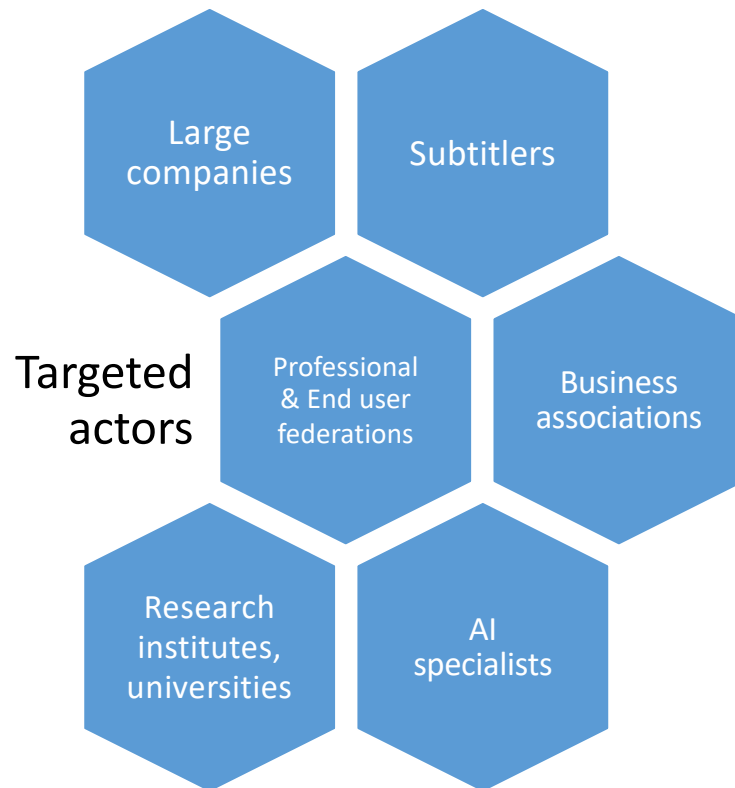
French Signing Avatar with French Subtitles

<https://rosettaccess.fr/index.php/le-projet-rosetta-en-lsf/>

French Signing Avatar with English Subtitles

<https://rosettaccess.fr/index.php/rosetta-project-in-fsl/>

Coming Calls - Contributors' profiles



- ✓ Identify relevant existing calls.
- ✓ Propose new research topics beyond the calls.

Next steps together?



Juan Moroni

Bridges, 180 x 180, mixed technique on canvas, 2017

Thank you.

Hadmut Holken

holken@holkenconsultants.com



Holken Consultants & Partners

Conceptual Thinking
Strategic Market Analysis

Innovation through creative collaboration
Market take-up of innovations

Social Innovation & societal challenges

Building bridges between stakeholders

- We belong to the  Steering Board & Executive Group since October 2011