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True-to-life requirements for using videoconferencing in legal proceedings

1 Introduction

This article provides some true-to-life and other requirements for videoconferencing in courtrooms or studios that are relevant to cross-border judicial proceedings. These requirements have been developed by several European Union member states in two projects, financed by the European Commission. The overview given in this article is not yet complete and is not focused on interpreting via video link. However, it is nonetheless provided here in order for other countries to benefit from it immediately. The final version of this document will contain an agreed set of requirements; that is to say, requirements that have been agreed by the participants in the action 'Implementing Transnational Use of Videoconferencing' to be both necessary and sufficient to reach a good level of quality for the use of videoconferencing in cross-border judicial procedures. These requirements, which are based on best practice, will not be binding and should be regarded as recommendations. The final version will be used in actions regarding the further implementation of 'transnational videoconferencing'.

A courtroom is an area where interaction between different parties in proceedings is of primary importance and where certain legal, traditional and ceremonial aspects also play an important role. Like courtrooms, examining magistrates' chambers, witness rooms and interview rooms in penitentiary institutions are no ordinary workplaces. The special feature of the interactions in such rooms is that each of the participants has a fixed role, and, often, a specific position in the room. The fixed nature of their roles dictates who they may be located beside or opposite. Considerable importance is moreover attached to ensuring that each participant can see and hear all other participants clearly and observe both verbal and non-verbal reactions. The use of videoconferencing in both criminal and non-criminal (civil) proceedings as a means of hearing witnesses, experts, suspects and immigrants at a distance therefore imposes such stringent requirements on equipment components and the composition, positioning and adjustment thereof that the audiovisual solution may generally be regarded as a tailor-made solution.

2 Assumptions

The following basic assumptions have been made: the use of videoconferencing should not disrupt the normal judicial process. Both proceedings and data should continue to be at least as reliable as at present. The audiovisual solution will be implemented in locations such as court rooms, police custody suites and prisons that have been selected by the authorities operating in the chain of organisations in criminal and non-criminal (civil) justice; any adaptation to rooms which may be necessary for such implementation in terms of the requisite lighting and acoustics, etc., can be carried out by third parties in consultation with the appropriate authorities. With the exception of areas controlled by

third parties outside the judicial domain, audiovisual data can be transferred via the Wide Area Networks in the judicial domain. The supply of the videoconferencing service to users within the judicial system should be organised centrally.

3 Regulatory requirements

The Legislation and General Administrative Order in The Netherlands lays down five requirements for the use of videoconferencing. Those five requirements – including the accompanying explanations – are reproduced in full below. The videoconferencing system should be set up in such a way that:

i. The persons concerned are provided with a true-to-life picture of what is happening in the other room.

Explanation: The videoconferencing system should be set up in such a way that the person being heard, his lawyer, the judge and other participants are provided with a realistic and clear picture of what is happening at the other end of the connection. This first requirement relates to the quality of the visual and audio connection. The fundamental principle is that sufficient account should be taken of the interests of the persons concerned. Consequently, the videoconferencing system must be of high quality. Only then will a hearing conducted via videoconference link provide a reasonable alternative to a face-to-face hearing. It is not acceptable, for example, for distorted images to be produced by zooming in or out in order to focus on a specific feature of a person. More particularly, the requirement means that sounds and images must be aligned accurately and reproduced without any perceptible delay. Furthermore, the external appearance, facial expressions, lip movements, direction of gaze, gestures and postures of the persons concerned must be clearly perceptible. Other persons present in the other room must also be visible. In addition, it should be possible for the persons concerned to interact with one another, and for the viewer to see how they comport themselves and react to one another through looks and speech. The sound must also be reproduced realistically. Speech must be comprehensible (insofar as this is also possible in the case of face-to-face listening), and it must be possible to speak simultaneously. When the person concerned is looking at a file, for instance, he should be able to communicate merely on the basis of the sound he is making.

ii. The persons concerned can consult with one another without third parties overhearing.

Explanation: There may be cases where a suspect, an immigrant, a witness etc. wishes to consult with his or her lawyer (whether or not via an interpreter) without the judge or any other participant in the judicial proceeding overhearing. It is therefore a requirement that mutual consultation should be possible without third parties overhearing.

iii. The persons concerned can exchange documents.

Explanation: The third requirement concerns the possibility of exchanging documents. It must be possible for the persons concerned to exchange the necessary documents, e.g. by fax. Even though few documents are exchanged during a judicial proceeding, it may be that one of the parties concerned does not have all the documents in his/her possession.

In such a situation, it should be possible to exchange documents, as is the case in face-to-face hearings.

iv. The system is safeguarded against loss or any unlawful form of processing.

Explanation: The authenticity of reproduction must be guaranteed. This requirement therefore specifies that the transmission of images and sound must be safeguarded. In other words, reproduction must be inviolable. The system must also be safeguarded in such a way as to prevent recordings from being intercepted unlawfully by third parties.

v. The system can be linked up to other countries' systems.

Explanation: In the field of criminal law, videoconferencing will often be used in connection with international judicial assistance. Hence the additional requirement whereby it must be possible for the system to be linked up to other countries' systems, and it must also comply with the international standards applicable to videoconferencing. Those standards have been drawn up by the International Telecommunication Union (ITU), which is part of the United Nations. In the case of videoconferencing which takes place via ISDN, VPN, Internet or SDSL, the applicable standards are currently H320 and H323. In the case of an ordinary telephone line, the applicable standard is currently H324.

4 Videoconferencing being NOT True-to-Life

It is also important to consider what might make one or more of the participants perceive that a videoconferencing facility, its look and feel, is *not* true-to-life. The main notion of true-to-life is that each actor can interact with each other actor in a natural way. It therefore follows that a videoconferencing facility is NOT true-to-life if it is difficult to:

- interact with one or more persons in one or other of the rooms,
- make eye contact with one or more persons,
- notice that one is being spoken to, looked at, pointed at or addressed,
- determine the provenance of a sound,
- see how each person comports him/herself,
- see how persons react to one another,
- see what is on each person's desk and what they do with their hands,
- see each person's external appearance, facial expressions, gestures, posture, lip movements and direction of gaze.

The lack of interaction may be caused by insufficient sound and image quality in the video link. Thus, a videoconferencing facility is *not* true-to-life if:

- images are unclear,
- images do not show everyone present in the other room,
- images do not show everything happening in the other room,
- images are not of the same size or quality for all persons,
- images are distorted by camera movements (zooming, tilting or panning),
- images show strange skin colours or shadows or distracting reflections on spectacles, images focus on a specific feature of a person, sounds and images are not real-time (delayed),

- sounds and images are not aligned (no lip-synchronicity),
- sounds are not realistic (volume too high, too low or changes when looking at desk), sounds are indistinguishable when speaking simultaneously and speech is not intelligible.

Interaction may also be hindered by the look and feel of the room if it differs from what is usual in court sessions. So, a videoconferencing facility is *not* true-to-life if the positioning or appearance of the equipment, the floor, walls, ceiling, furniture, lights, acoustics, background noise or environment make a participant feel as if they are not in a court room, or the perceived positioning of or distances to other persons on the screens differ from their actual positioning and distances in a face-to-face hearing.

5 Videoconferencing facilities - requesting versus requested

Transnational videoconferencing is used for any part of criminal, civil and commercial proceedings, in particular for the taking of evidence from remote locations in other states. For the purpose of this document, the focus is on the transnational usage of videoconferencing for criminal law applications, i.e. examining magistrate / rogatory commission. Within the European Union applications in criminal cases are usually governed by national acts and the Convention on Mutual Assistance in Criminal Matters between the Member States of the European Union of May 29, 2000 (further referred to as the "2000 MLA Convention"). Two authorities are involved: the requesting authority (this authority is in one state and wants to hear a person that is in another state and therefore requests assistance from that other state); and the requested authority (this authority is in the other state and receives from the authority in the first state the request for assistance to hear a person).

The seven main participants in a face-to-face rogatory hearing are the requesting judge, public prosecutor, court clerk, requested judge, person to be heard, lawyer and interpreter. Additional actors, like assistant judges or second lawyers, may participate in the hearing. In a face-to-face rogatory hearing the actors are often situated in a 'square', meaning that the person to be heard together with the interpreter are located opposite the (requesting and/or requested) judge and the court clerk, with the public prosecutor on the third side and the lawyer on the fourth side.

In a rogatory hearing via videoconference, the participants are located as follows: The person to be heard, the requested judge and, in many cases, the interpreter and lawyer are located in the VC facility of the requested authority. The requesting judge, court clerk, public prosecutor and, in some cases, a (second) lawyer or the interpreter are located in the VC facility of the requesting authority. Note that the location of some actors is not fixed. The videoconferencing facility should allow all actors to be situated at their normal position. In order to hear a person via a videoconference link, both the requesting and requested authority require a videoconferencing facility, e.g. a court room or examining magistrate's chamber fitted out with videoconferencing equipment. During the videoconferencing session these facilities are connected to each other and are to be regarded as a single (court) room. Each videoconferencing facility should be built in such a way that it can operate in requested as well as in requesting mode and should accommodate the most common variants with regard to how many actors are participating and where they are situated. If the VC equipment is appropriately set out,

the court room should remain suitable for face-to-face judicial proceedings. Its VC facility should be able to be used for other types of legal procedures.

6 Equipment components

All equipment components should as far as possible be standardized on the basis of the same quality of equipment and the same configuration. In so far as the rooms in the judicial premises permit this, an attempt should be made to ensure that the equipment is positioned in the same way in all types of rooms. The following sections cover execution, explanations and compliance with the five aforementioned requirements as regards the aspect of image, sound and audiovisual environment.

6.1 Image

It is recommended that requirements can be satisfied through the use of three types of screens:

- Focusing screen; for transmitting images of the participants in the other room,
- Overview screen; for an overview of the situation in the other room,
- Information screen; for transmitting documents and other information. This includes any screens located in participants' "work stations").

Objectivity: each participant must be portrayed in the same way on a screen. Participants must not be portrayed differently. The lighting intensity, colour balance, resolution and frame rate must be identical for each participant. All the images must be as objective as possible.

Eye contact: as far as is possible, eye contact must be imitated. The smaller the angle in the vertical and horizontal plane between the participant's direction of gaze towards the person shown on the screen and the line of vision of the camera reproducing the image in the other room, the greater the impression of eye contact (eye contact is made where there is 0° of deviation). All participants in room A (e.g. the judge and the lawyer) must have an equally great impression of eye contact with participants in room B (e.g. the person to be heard). The impression of eye contact gained from the position of the judge, for example, must not differ from that gained from the position of the lawyer.

6.2 Positioning

Equipment must be positioned in such a way that only minimal adjustments need to be made to the position participants would normally adopt in a traditional court setting. It must not be necessary, for example, for lawyers and judges to sit at one table or in close proximity to one another. At the same time, the equipment must be positioned in such a way that cases can still be handled without videoconferencing in the relevant courtroom. Furthermore, it must be possible to position cameras, screens, lighting and participants in such a way that the entire set-up is suitable in as many situations as possible in both criminal and non-criminal (civil) proceedings.

Cameras, screens, projectors, lighting, furniture, etc. and participants must be positioned in such a way that they do not block the participants' view of one another or

the view of the general public. Cameras (except for overview cameras) must be placed at eye level. Participants should not be filmed from above or below.

The focusing screen must be positioned to reflect the situation in the courtroom as realistically as possible. The perceived distance between the participant being filmed and the observer must be comparable to normal circumstances. In other words, participants, cameras and screens must be positioned to simulate the usual distances between participants. The cameras must be positioned to ensure that: (1) when a participant looks at the person on the screen, the latter is fully aware that he or she is being looked at, and (2) when participants in the other room look at one another, the person watching the screen is fully aware of this. A person observing the other participants on the screen must be able to identify who those participants are looking at.

The overview screen must be positioned in such a way that the general public can see everything the judge sees. The overview screen and the focusing screen must be positioned closely enough to each other to ensure that both screens are visible to all participants without them having to move their heads.

6.3 Lighting and contrast

The lighting/colour contrast must be such that facial expressions are always readily discernible; there is no shadowing around the eyes; skin colour is authentically reproduced; users are not dazzled; there are no reflections on screens and no distracting reflections on spectacles; documents are easy to read; and the contrast between the lighting intensity of the participants' facial skin colour and the background must be such that facial expressions are readily discernible.

6.4 Camera-image mapping on screens

The image layout on the focusing screen must be such that the following aspects are clear in respect of each participant: facial expressions, lip movements, directions of gaze, gestures, upper body posture, table and objects. The setting in which the videoconference link is used determines how many participants are shown on the focusing screen; the depiction of between 2 and 4 participants per room will usually suffice. The position of the focused images of participants on the focusing screen (e.g. with the interpreter on the left and the lawyer on the right) must correspond to their actual position in the room and hence to the image of the same participants on the overview screen (e.g. with the interpreter on the left and the lawyer on the right).

The image layout on the overview screen must be such that participants are able to judge the actual distances between the persons in the other room on the basis of the images transmitted; observe and recognise persons in the room; determine who is looking at and speaking with whom; and see how the other persons move with respect to one another. The image layout of the information screen must contain the image filmed by the document camera.

6.5 Screens

The number and type of screens required will be determined in consultation with the supplier. The following indications are for guidance only. Viewing angle and viewing distance must be such that all participants can use the same screen in the same way. Size

should be large enough to ensure that – in terms of the viewing angle – the persons involved can preferably be shown to the same scale as would be perceived at a normal meeting. Because of the importance of the viewing angle, the screen size must be determined in conjunction with the distance from the screen; a 72 or 120-inch screen may be required. Type should possibly be LCD or similar. Resolution should be high enough to be able to convey a clear indication of facial expressions, lip movements and directions of gaze given the selected screen layout and image contents, possibly at least WXGA or similar. A minimum of 25 frames per second may be required. Facial expressions must be readily discernible and viewing comfort high. There should be no distracting delays or distortions (blur). Contrast should be sufficient for use in areas for reading/writing. Mounting should preferably be fixed, if necessary on wheels (this certainly applies to mobile equipment).

It is recommended to use two screens. One focusing screen, the position of which has yet to be determined; this will show the focused images from the other room, one overview screen, the position of which has yet to be determined; this will show the overall view from the other room. The overview screen must also be usable as an information screen.

6.6 Cameras

The number and type of cameras required will be determined in consultation with the supplier. The following indications are for guidance only:

- *Angle size of overview camera:* must be large enough to ensure that all participants are fully in the picture and make it possible to see people entering the room.
- *Angle size of focusing cameras:* must be large enough to ensure that: (1) the participant's face, shoulders and upper body and hands and objects placed on the table are clearly visible and (2) users do not feel restricted in their movements. All participants must be able to move within an area of 80 x 80 cm without disappearing from view. They must therefore be able to gesture, turn towards other persons present and lean forwards or backwards without disappearing from view.
- *Light sensitivity:* must be such that participants can clearly distinguish one another's facial expressions (this also applies to dark-skinned persons). Cameras should be suitable for colour images.
- *Mounting:* cameras should preferably be fixed and should follow participants as they stand up and sit down (e.g. the public prosecutor and lawyer). The public prosecutor and lawyer must be viewed in accordance with the relevant requirements even when they are standing up.
- *Adjustability:* cameras must be fixed to one or more pre-set positions for panning, tilting and zooming; one of the possible positions should be pre-set as a preference.

In the Dutch situation it has been decided that during the implementation phase only fixed cameras should be used; this is in order to avoid the image of some of the actors constantly changing and/or not conforming to other requirements. In practice this necessitates the use of extra cameras and sometimes switching between images on the screen. It is recommended that seven cameras should be used: six cameras, each one directed at a participant (the person to be heard, the examining magistrate, public

prosecutor, lawyer, interpreter or clerk) and one camera to provide an overview of the courtroom or examining magistrate's chamber.

6.7 Processor

A digital video-processor should be used to assemble the camera images, possibly on a "picture in picture" basis. The processing speed of the system as a whole must be such that facial expressions are readily discernible and viewing comfort high.

6.8 Sound

Speech must always be readily intelligible. No words must be lost during a video-conference link. The quality of the sound must be continuous, and no extraneous interference or crackling may occur. Speech quality must not deteriorate as a result of speech compression. This means meeting certain requirements as regards lip synchronicity (a delay of less than 0.15 seconds), echo cancellation and background noise and reverberation. Participants must be able to speak at the same time and be understood.

6.9 Microphones

The number and type of microphones required will be determined in consultation with the supplier. Account will also have to be taken here of any desire to use a sound installation already in place in a room (usually a courtroom) for videoconferencing purposes, provided that the installation is of adequate quality.

Microphones must be positioned in such a way that all participants are clearly understandable in the other room with no distortions caused by background noise. It is recommended to use microphones that are built-in (into desks or elsewhere), eavesdropping-proof, direction-sensitive, permanently switched on, and not fitted with a mute button. The court clerk has a central mute button, fitted with automatic volume control, and a central volume button, positioned and adjusted to ensure that all participants are clearly understandable in the other room with no distortions caused by background noise. It is recommended that one microphone is used for each participant.

6.10 Speakers

The number and type of loudspeakers required will be determined in consultation with the supplier. The loudspeakers must be positioned and adjusted to ensure that all participants in the other room are clearly understandable with no distortions caused by background noise. As a general principle, speakers must be positioned on either side of each screen.

6.11 Audio delay unit / amplifier

The audio processor must be suitable for at least sixteen microphones.

6.12 Exchange of documents

Participants must be able to exchange documents securely. This applies to the exchange of information in both paper and electronic form. Documents in hard-copy form, e.g. documents submitted at a court session, are shown on the information screens. The documents are filmed using a document camera/visualiser, which will probably be operated by the court clerk. It is recommended that one visualiser should be used. Note that the document camera is also capable of showing objects other than documents. Where a document camera is not available, a printer and/or fax in the room is required.

6.13 Mobile equipment

This section covers execution, explanations and compliance with the five aforementioned requirements regarding the aspect of "mobile equipment" for special situations on a temporary basis, such as in a prisoners' hospital, a secret location of a witness, or in the event of fixed equipment breakdown.

It is recommended that procuring one or more additional sets of mobile equipment (screen + camera + speaker + microphone + accessories) should be considered. Such equipment must be usable either in various combinations or in conjunction with a fixed set of equipment. The mobile equipment must be readily transportable (and hence not necessarily on wheels), easy to move between the different locations and flexible in terms of its use. Consequently, more limitations are expected to apply to mobile equipment than to fixed equipment (e.g. as regards the number of participants who can be filmed clearly at the same time). However, every set of mobile equipment must still comply with the five requirements laid down by the legislation.

6.14 Operation

This section covers execution, explanations and compliance with the five requirements outlined above as regards the aspect of "operation". For the operation of the videoconference equipment it is recommended that one Touch Panel should be used, to be installed at a location in the courtroom yet to be determined. It must be possible to use the audiovisual solution at every connected judicial location. Note that there are limitations on allowing the judge to be fully in control of the proceeding (e.g. there are no operator facilities in a penitentiary institution). Operation must be as user-friendly (i.e. as simple) as possible, and should therefore consist of only a limited number of manoeuvres, e.g.: switch on (in all the rooms concerned), select type of court session (number and role of participants per room), select other court location (from a pre-programmed list), connect to other location, mute/pause court session, share document, disconnect and switch off.

The applications menu should be pre-programmed in order to cover all situations applicable to the room in question including, for example, the hearing of persons by an examining magistrate and other criminal and non-criminal proceedings. The menu should also list all rooms to which the videoconferencing facility can connect.

Participants must be clear as to which court session is taking place. In order to verify the establishment of the visual and audio connection between the intended rooms, the name and/or number of the room in which the equipment is located should be fixed to the wall in view of the camera. It must be possible to establish the connection required for

the meeting and to make the correct adjustments within one minute. Since the visual and audio connection is between two rooms (point-to-point) only, it must be impossible for a third room to break in into this visual and audio connection.

The system will be operated by a person determined by the court, e.g. a court clerk; such persons will attend a short course of training in how to operate the system. During use, the audiovisual solution must not require the intervention of an operator (this includes the case of activating the central mute button, e.g. for the purpose of a lawyer-client consultation). The operator and/or security guard must remain on hand in case of any problems. If any problems arise, the local operator must be able to ring a help desk (which should be set up within the judicial system). The help desk should only have to offer assistance in the case of operational failures. In the event of failures of the audiovisual system and/or the network, the help desk should report the fault, which must be repaired before the following working day. It is for the judge to decide whether to abandon a case that has been disrupted in this way. In principle, it should not be necessary to adjust the positioning, focusing or configuration of cameras, screens, lighting or sound. Where this is necessary, however, servicing should be as simple as possible in order to ensure that there is a minimal risk of loss of quality in the videoconferencing system. Equipment will be replaced by the supplier. The supplier should therefore have "hot spares" in place in order to ensure reliability.

6.15 System Management

There should be a simple system of supervision of the audiovisual solution. As stated above, a help desk should be set up to service and support operational use; a supervisor should maintain a list of configurations, a list of usage and a list of faults for each location, and such lists should be reviewed periodically. Furthermore, a strategic board should monitor the use of videoconferencing in judicial proceedings and decide upon alignment between what law requires and technological availability.

6.16 Infrastructure

Network capacity must be sufficient to satisfy user requirements as regards image content. In addition, bandwidth should be the same for all participants in order to ensure that they are all portrayed in the same way and are able to exercise the same degree of influence on one another (resolution, delays). This also applies to use in conjunction with other countries. The location of the network connector must be such that the system can easily be connected.

6.17 Codec

The codec must be suitable for the member state's network. It should be suitable for other temporary connections with encryption (this is in order to make provision for applications such as the hearing of witnesses and experts who are located outside the judicial premises).

6.18 Resistance to vandalism

Equipment, including microphones, should as far as possible be vandalism-resistant. This can be ensured *inter alia* by the type of mounting used.

6.19 Reliability and maintenance

In order to ensure the orderly conduct of meetings using videoconferencing, the audiovisual solution must be highly reliable. The supplier should ensure such reliability by carrying out both preventive and corrective on-site maintenance of equipment components where required for each location; the supplier will be assisted in that task by a facilities manager in each location.

7 Conclusion

The requirements outlined in this chapter focus on the use of videoconferencing in courtrooms for cross-border judicial proceedings. They highlight that 'True-to-life' means more than simply the equipment involved in video-mediated legal communication. True-to-life is a comprehensive concept that covers the room layout, positioning of equipment and participants, lighting and a range of other factors. Cross-border proceedings often involve an interpreter. The discussion in this chapter makes it clear that many of the issues surrounding legal videoconferencing are exacerbated when cultural and linguistic barriers (and therefore an interpreter) are added to the technological mediation of the communication via videoconference link.

