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TESUS I Additional Report for Partner C3, Institute for Applied Informatics, Research Centre Karlsruhe

1 Remarks to the first report dated January 19, 1998

At the begining we want to state that all the work carried out in the TESUS I project by the Institute for Applied Informatics as it was described in the report dated January 19, 1998, is fully compatible to the program definition. The concerns of the project board especially about the interactive teleconsultation scenarios driven by a proprietary serial line protocol via ISDN or via the standard protocol SNMP cannot be accepted, as the original TESUS description of WP07 says: *"WP07 will define the specifications for enhanced services in the following TESUS 1 concepts: Teletraining, Hot-line and Duty. All of these aspects are of course to be understood on-line. The need for transmission of high quality video and distant interaction with the images will appear mandatory ..."* The term *"enhanced services"* implies a value-added service for the mentioned *"Teletraining"* and *"Hotline"* which definitely leads to the needs of implementing a control component at least for the main surgical information source, the endoscopic view. Furthermore we do not accept any concerns about the work having already been started, as the TESUS 1 program explicitly tells: *"The engineers will have started theri technical specifications approach for WP07 before timing ..."* Thus the work carried out by partner C3 is to be understood as one approach which has to be discussed within the WP07. There is no doubt about the complience neither of our topic F — VR based surgical training service — with the program description of WP07, nor of our topics C, D, and E with the specification of WP10. Unfortunately the technical partners were not granted to get a visioconferencing system at a special price, so to carry out the works for TESUS 1 it was mandatory to get a system of our own, which is suitable for the work in the advanced workpackages 07 to 10.

We want to emphasize that the work described in the above mentioned report was not yet included into our cost statement dated August 22, 1997. Unfortunately up to now the workpackages 07 to 10 which solely include any work of partner C3 have not been started, thus all the work carried out under the aspects of these workpackages has been done in advance at our own costs at the moment.

We furthermore want to state, that we are not included in any other projects that contribute financially to the work described in our former report.

This report in addition to the overall report of partner C3 dated January 19, 1998 is dedicated to the WP04, multiconferencing platform. It does not replace any work described in the former report but wants to distribute additional ideas in the field of this specific workpackage on multiconferencing.

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2 Technical principals of the multi-point conference

Point-to-multipoint visioconferences (abbreviated P2M in further) are quite similar to point-to-point (P2P) conferences. In fact they use the same end-systems as P2P. Thus all the recommendations and rules given for P2P systems are still valid for P2M systems, P2M can be seen as a natural evolution from the P2P technique by adding a single piece of value-added hardware. As stated before, P2M technique only needs one additional hardware called 'MCU', multiconferencing unit.

A MCU concentrates as many ISDN lines as needed to connect to each P2M partner with the appropriate bitrate. MCUs usually are scalable or they can be cascaded to extend the number of concurrently served partners. The scalability usually is independent from the number of available ISDN links. This means that it is possible to run for example a 16 party MCU on an ISDN PRI thus allowing the P2M interconnection of five partners at a quality of 384 kbps or 15 partners at a quality of 128 kbps.

A MCU in principle runs two functions:

- it does set-up a P2P connection to each partner concurrently
- it distributes the sound and video streams of one participant (who currently has got the focus) to all other participants.

In consequence of that basic functionality P2M technique differently from P2P needs a session management to switch the focus among the communicating partners, which is provided by the MCU, too. The MCU therefor defines two tokens which represent two classes of rights granted to a partner, the first token stands for the focus in sound, the second token stands for the focus in video. Thus it is possible to deliver a common video stream concurrently to all participants derived from one partner but to have the audible comments on the video derived from a different partner and distributed to all other partners. Mainly there are two principals of managing these tokens:

- an automatic token passing controlled by sound: both tokens are put to the partner who at last produced some sound at his site. This principle is excellent for controvers discussion among a small number of participants because there is no need of a dedicated session leader, but it needs a very good discipline at all partners, who are not allowed to produce any noise like snorring our shouts while another partner is speaking.
- A manual token passing controlled by a session manager, who can pass the tokens indepentently to any partner.

MCUs can be installed at one site in a consortium of frequently communicating partners (like in the TESUS network), but it is also possible to use a MCU in form of a service provided by a public carrier. The hardware in the latter case is out-sourced to the carriers location and the participants call at a special service line or they are called by the MCU. The session management, if not done in automatic mode, can be passed to one of the partners.

As the endsystems in a P2M conference are the same systems which are deployed for P2P visioconferences there are still the same possiblities to connect audio-visual sources. If the end-system itself is not capable of connecting different sources directly, an analogue video switch (cross-bar) and an analogue audio mixer can be used as a multiplexer for different independent sources. Usually these cross-bars and mixers are remotelyx controllable via serial lines or TCP connections, which may allow every partner to interact with these devices.