

## **Virtual and Real Knowledge Presentation in Medical Practice - Hypermedial Characteristics of the New Multimedial Collaboration Center at the "Sisters of charity" Zagreb University Hospital - <http://www.kbsm.hr>**

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### **Summary**

As we have pointed out in our [earlier works](#), many academic and other institutions use, or have a need for, some kind of "knowledge laboratory" where a good and professional presentation can be prepared. To present actual knowledge in a new [structural markup](#) or graphics, to use various possibilities of video and audio presentation, gain experimental experience, but also to have some knowledge of security and special clinical security, and combine all that with many other humanistic communication skills is an everyday need of the people who (will) work in such laboratories. As content presentators, we often prepare our work by ourselves, but this time we are proud to say that our multidisciplinary team helped us in preparing our knowledge presentation. Their collaboration has been a crucial element to complete this work successfully.

Since such knowledge multimedia presentation center needs a spacious room for everyday medical collaboration using web or telemedicine, a large presentation hall at Sisters of Mercy Zagreb University Hospital has been adapted for that purpose. Prof. Z. Kusia, who acted as director of Hospital on initiative for adaptation, Prof. M. Belitza, who initiated a collaboration of the people who use multimedia possibilities in their everyday clinical practice, D. Bengez, M. Belicza, T. Klenovar, Ž. Nikin, Z. Papeš, V.K.Papeš, S. Mišak and R. Vojnovia prepared hypermedia characteristics of such knowledge multimedia presentation center.

With CARNet's multimedia and telecommunication experience and their support in equipment for 11 Mbit microlink connection (implemented by Microlink d.o.o) between "Sisters of charity" Zagreb University Hospital and CARNet, with D-Soft equipment and support, with El-ing experiences in structural optical and conventional cabling, active Cisco equipment from Infosistem, our implementation of Linux web-kiosks made in Comtek or web-kiosks made by Ericsson, with HSM video equipment, and Nikin-elektronika audio equipment, as well as big support from the employees in the hospital library and maybe some of your suggestions, we have prepared the hypermedia collaboration center with wireless connections, more secure internet and intranet concept (D. Bengez), and web and knowledge presentation laboratory, to be put in use in October, 2001. Welcome.

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## Development of Telemedical Sign

Insight in microstructures or structures screened from view, insight in their motions, assessment of their influence on functions, and documentation of the states or progression before and after a certain activity, whether preventive or therapeutic, are within the foundations of medical and health care development. Comparing different ways of problem solving at either local or global level, either within seconds, as when dealing with an emergency case, or within longer periods when we can take time to simultaneously perceive and interpret important, synchronized elements to gain understanding, as in situations of high-quality learning, or demonstrating interconnectedness of various elements - represents a challenge in the process of restructuring medical communication as well as in the elaboration of the articulation of telemedical sign.

Medicine is one of the most demanding and most challenging fields of the application and verification of technological advancements. First insights in microstructures or anatomical parts were hand-drawn and today we have shiny photographs; first there was hand written, then printed, than digital presentation and dissemination of information; first presentations were static then dynamic, but nevertheless passive, and today we have interactive, dynamic ways of web-based communication and video teleconferencing, which also involve the issues of security. Functioning of the human being in dynamic synergy of many systems is a challenge to high-quality medical practice today, which aims at comprising, understanding, maintaining and improving it.

However, efforts of the World Wide Web Consortium to develop the web to the level of "its full functionality" have illuminated the problems in the first generation Web. Browsers have been detecting too many noise and have not been developed quickly enough according to standards, HTML 3.2 together with CGI scripts, Java applets, JavaScript languages plus plug-ins, such as Shockwave, RealPlayer, or Quicktime, have offered Web authors a wide range of techniques to give form to the content, but more in respect of decoration than structural presentation, which, if possible, could be done only with difficulties.

The system of signs had to be given such a type of elements which would release it from the dependence on (only one) presentation, even from the dependence on browsers, and to retain the ability to be transferred by HTTP protocols, or the Web. XML language has brought exactly that type of elements needed for creating other signifying languages, which by the textual linguistic elements at the same time readable to both a man and computer describe data with words known by a man. In this second generation Web or Semantic Web, vocabulary is in more complex cases presented by a document (DTD) which contains explicit list of names and regulations of their (hierarchical) relationships, obligatory presence of an element, the repetition of elements, their type and initial value. Precisely because their presentation is not intended to the presentation of content, there are possibilities of different adaptations of the presentation of the one same content. (HTML reflects the structure of a document, but cannot adequately present the structure of the data.) Additionally, efforts will be made to define and standardize meanings on familiar locations, so-called ontologies (see DAML+OIL ontologic language).

## Evolution in the Presentation of Knowledge. What is "structuring knowledge to present it through the Web", who will do it and what is the importance of it in telemedicine?

We have often heard critical comments that computers cannot replace experience and that (in technologically more developed parts of the world) providing educational institutions with Web links and teachers with knowledge on informatics and computers is unjustifiable investment. It is true; if teaching contains but virtual copy of teacher, school board, video, or book, then such "copying" of "educational reality as we know it" cannot easily justify the efforts invested.

Search for real and true knowledge requires analytical insight by quickly reachable content of different relationships (directed by author's suggestions as well as found by investigative experience of the reader aided by more efficient possibilities of automated computerized classification allowed by such record.

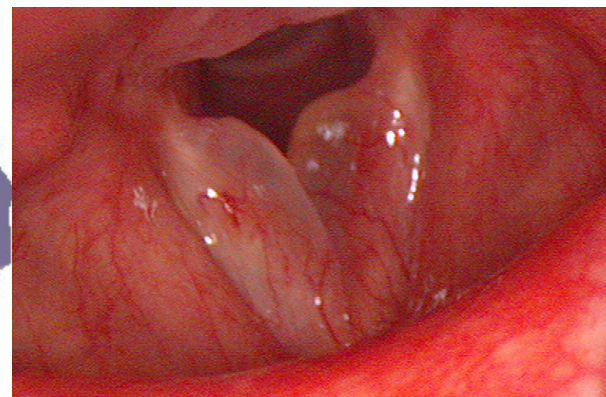
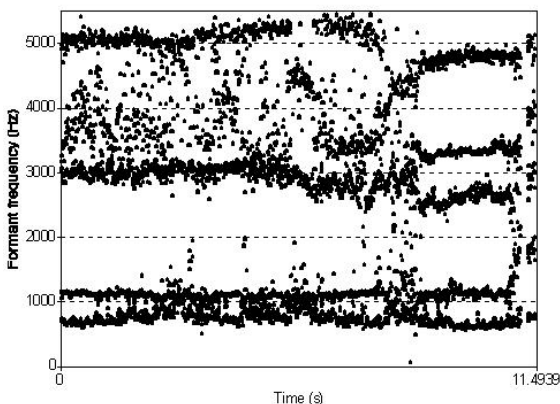
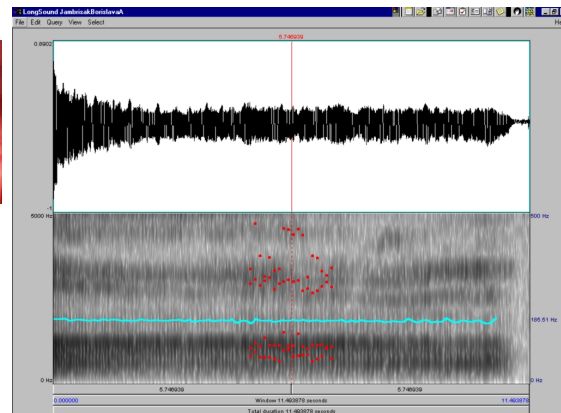
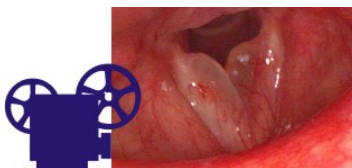
Let us see what is a presentational integration of hypermedial presentation of knowledge in the field of otorhinolaryngology (phoniatics) and let us compare it with conventional ways of knowledge presentation.

**anamneza - dijagnoza**

god. rođenja	1953
zanimanje	novinar
govorni profesionalac	da
pušenje	da (60 kom.)
...	
dijagnoza:	oedema Reinke

**liječenje**

- smanjiti ili ukinuti pušenje, alkohol
- ne glasno govoriti
- ne piti gazirana pića
- uzimati lijekove prema preporuci

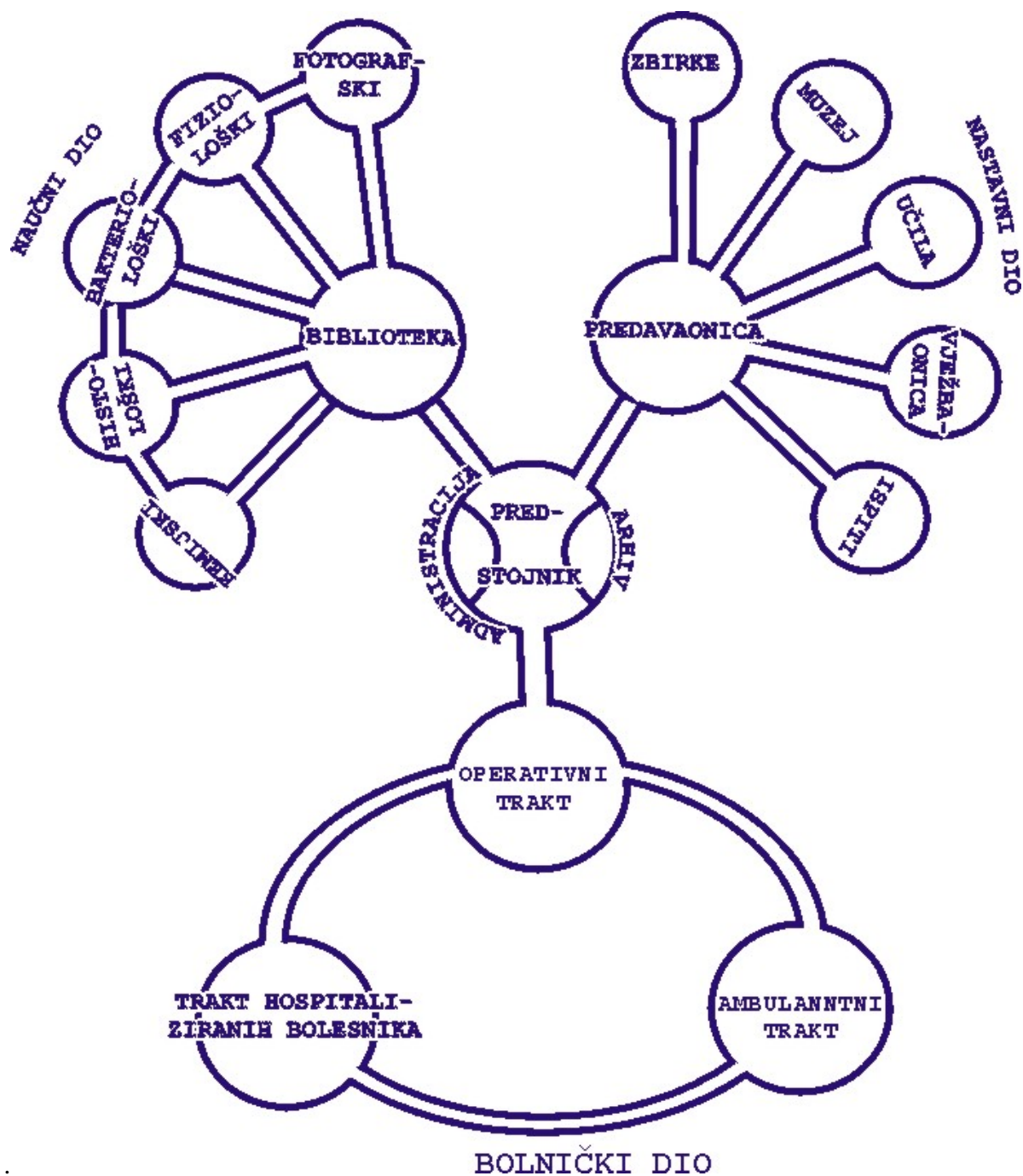


anamneza - dijagnoza  
liječenje

prevencija

# What would Ante Šercer say to those who think that physicians should use web only at home, because in hospital they have better things to do

Maybe it is not a coincidence that on the occasion of renovation and transformation of a large hall at Sisters of Mercy University Hospital into a Multimedial Center during the fall 2001, the emphasis is given to a new and unique level of clinical, scientific, and educational integration, which hypermedial organization brings to the hospital by means of optic cables. Ante Šercer (1896-1968), the Dean of Zagreb University School of Medicine, a member of the Academy, and one of our most prominent encyclopedists, initiated the building of that hall. He wrote erudite chapters of the genesis and generation of voice, speech and letters in his book Otorhinolaryngology I, Propedeutics (1951), and published the concept of the clinic in Liječnički vjesnik in 1941, in which he had integrated all the laboratory, scientific, educational, and bibliothecal functions. Today, we might say that he was already aware of hypermedial needs of every (medical) profession (see figure).



## Hypermedial Function of the Multimedial Center at Sisters of Mercy University Hospital

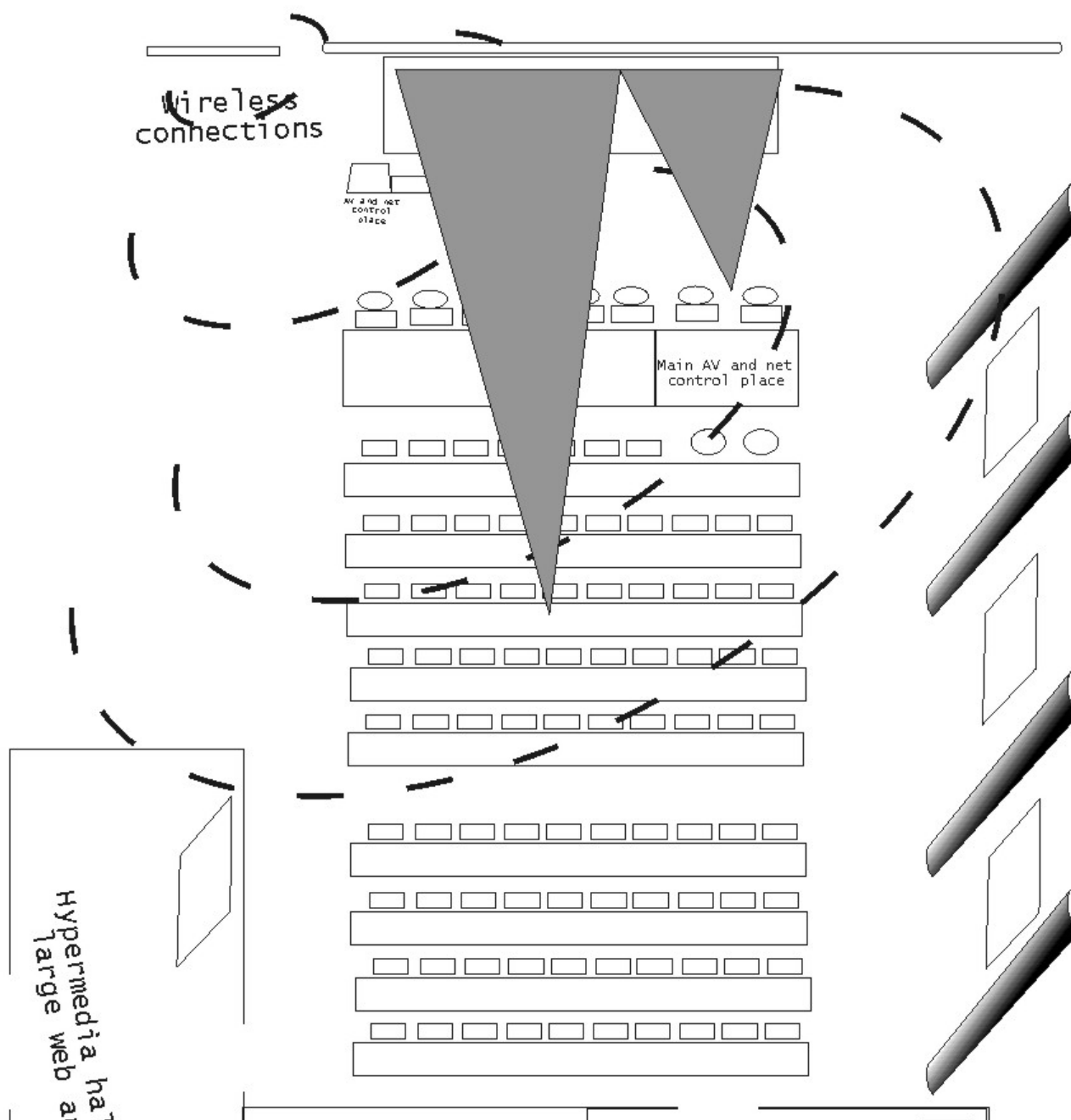
While making a concept of hypermedial function of the Multimedial Center at University Hospital Sisters of Mercy in the mentioned hall to serve for presentation of above mentioned elements of telemedical sign, we were aware of the possibility that we might miss to mention some of the important elements. Here we offer those most important ones and ask kindly all interested readers to warn us and add what we have not.

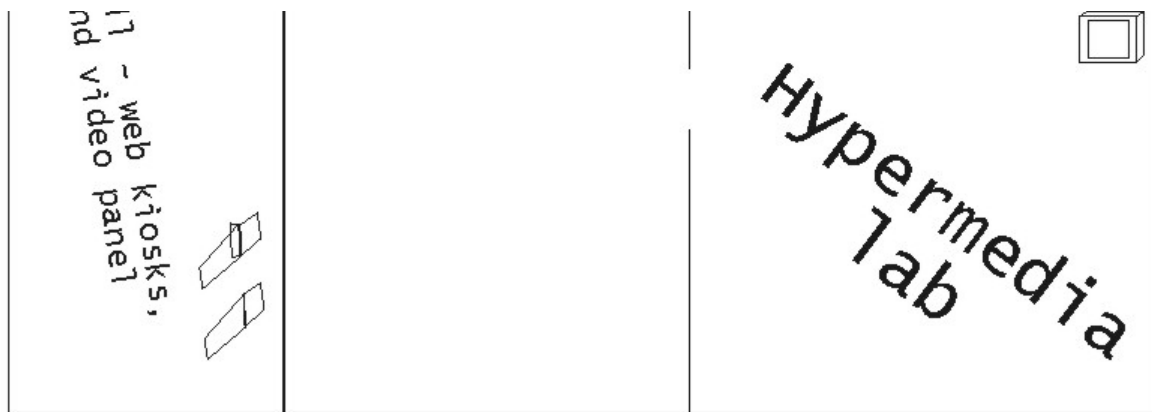
Present connection of Sisters of Mercy University Hospital is realized through 11 Mb air link to CARNet. Security layers and separated though integrated networks are being designed separately. Public (including the hall, lectures, and web-kiosks) and intranet layers are also planned. Everything is based on integrating network of optical cables connecting clinics, institute and Multimedial Center of the Hospital with a farm of servers. As a support to that activity, there will be a laboratory for hypermedial research (design center) established to follow (explosive) development, experimental work and as an aid in preparation and presentation of knowledge. Presentational, conferential, hypermedially networked hall, with

the teleconferencing support, wireless ways of inclusion into public part of the local network and room for teleconferential video panels and web-kiosks in the lobby is soon to be finished. The presentational website of the Hospital at <http://www.kbsm.hr> is in preparation. Procedures of video compression are also deliberated. Hybrid reading room of the hospital library is about to be linked with Multimedial Center. It seems that Šercer's integrations is under way.

Optical 24 MM cable connection to root node

To hybrid library reading room





## References

- *Visual captures for speech signal* was made with analytical program Praat 3.9.34 - a system for doing phonetics by computers, copyrighted 1992-2001 by Paul Boersma and David Weenink, free for noncommercial use, see (<http://www.praat.org>)

*Historical data are from:*

- I. Padovan *Život i djela Ante Šercera*, Globus, Zagreb 1997.

- ur. Z. Kusiač, *Sto pedeseta obljetnica Kliničke bolnice "Sestre milosrdnice"*, Birotisak d.o.o. Zagreb 1997

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