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Here is a brief review which I summarize from the Society of Nuclear Medicine Meeting. These materials are reported on the SNM website. If you are interested in detail of these reports you can access to these addresses;

www.med.harvard.edu/JPNM/physics/SNMmidwinter.txt

count51.med.harvard.edu/JPNM/Lectures/WebBasedNucMed/WebBasedNucMed.html

The first address is the Personal notes of Robert E. Zimmerman from the SNM mid-winter meeting took place at Palm Springs, CA on February 8-11, 1997. The second one is the joint program in Nuclear Medicine, Harvard Medical School written by J. Anthony Parker and is also presented at the Society of Nuclear Medicine Annual Meeting at San Antonio, Texas on June 3, 1997.

SNM mid-winter meeting⁽¹⁾

This personal notes is written by Robert E. Zimmerman. Some of us may know him. Most of his notes are about Image Registration and Fusion. Recently, this topic is interested by many institutes. In 1995, Katyal S et al.⁽²⁾ studied the role of fusion of immunoscintigraphy SPECT with CT in the staging of non-small cell lung cancer(NSCLC). They concluded that fusion of CT and SPECT augmented the information provided by each separate modality. Also, there are three researches in 1996. Gilardi MC and his friends⁽³⁾ reported the use of multi-modal biomedical images of the heart (PET, SPET, MRI, Echocardiography). The other research is about intracardiac thrombus by Suga K et al.⁽⁴⁾ They used the In-111-labeled platelet SPECT and CT/MRI superimposition to localize the intracardiac thrombus. They concluded that this technique was useful in accurately localizing the intracardiac

thrombus. Moreover, Pietrzyk U et al.⁽⁵⁾ applied this technique in brain images.

In 1997, there are two reports about this technique. One is the fusion image between Bremsstrahlung SPECT and CT written by Parsai EL et al.⁽⁶⁾ This technique is useful for direct anatomic confirmation in the neoplasms treatment by using infusional brachytherapy. Another one is the normal fusion technique reported by Stokking R et al.⁽⁷⁾ This technique is the three-dimensional integrated visualization of functional (from SPECT) and anatomical (from MRI) information. They applied this technique in brain images and concluded that it provided a potentially comprehensive and diagnostically value.

As mentioned above, image fusion is an interesting topic at the present time. In Zimmerman's notes, there are several researchers presented their experiences in this technique and also some discussions.

Dr. Alpert from Massachusetts General Hospital, Boston divided the methods for image fusion and registration as follows;

1. guess and try
2. matching of intrinsic and extrinsic fiducials
3. principal axes transformation
4. surface matching
5. volume-intensity

Whereas, Dr. Pizer from University of North Carolina, Chapel Hill presented some different technique from Dr. Alpert's i.e.,

1. manual
2. intensity matching
3. point matching
4. boundary matching
5. medial locus method
6. optimized, involving guided measure on locus introducing concepts of boundariness and medialness.

Another topic is about internet in Nuclear Medicine and the PACS (Picture Archiving and Communication System). Dr. Smith from U Rochester, Rochester presented the objectives of the spec as follows ;

The major objectives were

1. all image systems in nuclear medicine should be on the PACS
2. integration of hard copy printing for all stations
3. interchange files between all vendors for optimal processing
4. soft reading of all images
5. digital archive of all data with reversibility
6. modular approach
7. less than \$400k
8. had to interface to IDXrad, the RIS for the department
9. adhere to standards such as Interfile 3.3, DICOM 3.0 and HL7

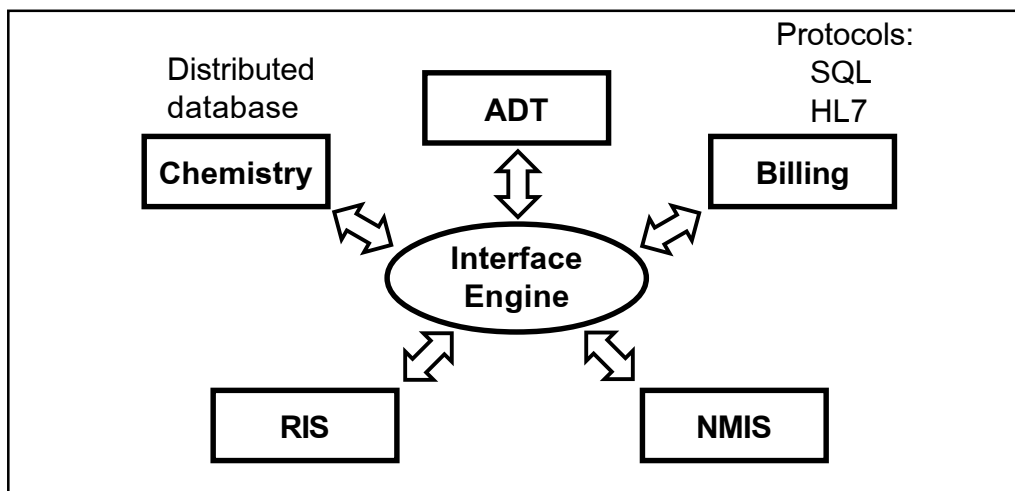


Fig. 1 Hospital Information System for Web-Based system⁽⁸⁾
 (Figure was re-created to improve printing quality - editor)

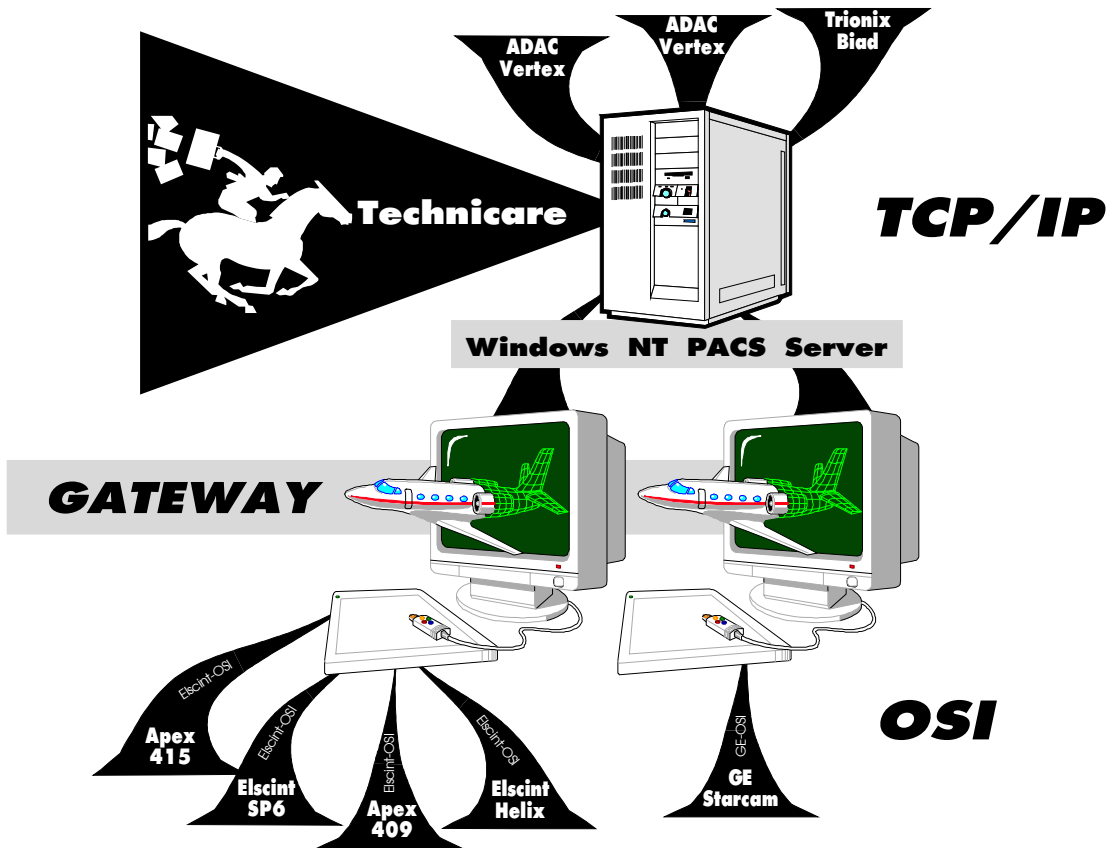
- HIS = Hospital Information System
- ADT = Admission Discharge Transfer
- RIS = Radiology Information System
- NMIS = Nuclear Medicine Information System
- HL7 = Health Level 7
- SQL = "Structured Query Language"?
- DICOM - ACR/NEMA 3 for European sensibilities

Also, Dr. Halama from Loyola U, Chicago discussed about a www activities within the nuclear medicine community. In the future, there will be a project at Loyola to integrate multiple vendors onto a www system based on NT server with SQL database using ActiveX and VBscript as the programming environment. This system would bring together Siemens, Toshiba and ADAC systems into a common environment for reading, archiving and printing.

Moreover, Dr. Parker from Beth Israel-Deaconess Medical Center in Boston described about the Web-based Nuclear Medicine Department which I would like to go into some details from website mentioned on the first paragraph.

Implementing PACS : Web-Based Nuclear Medicine⁽⁸⁾

The web-based system has been used in the Department of Nuclear Medicine, Beth Israel Deaconess Medical Center since 1995. (Fig. 1)



*Fig. 2 Nuclear Medicine Information System⁽⁸⁾
(Figure was re-created to improve printing quality - editor)*

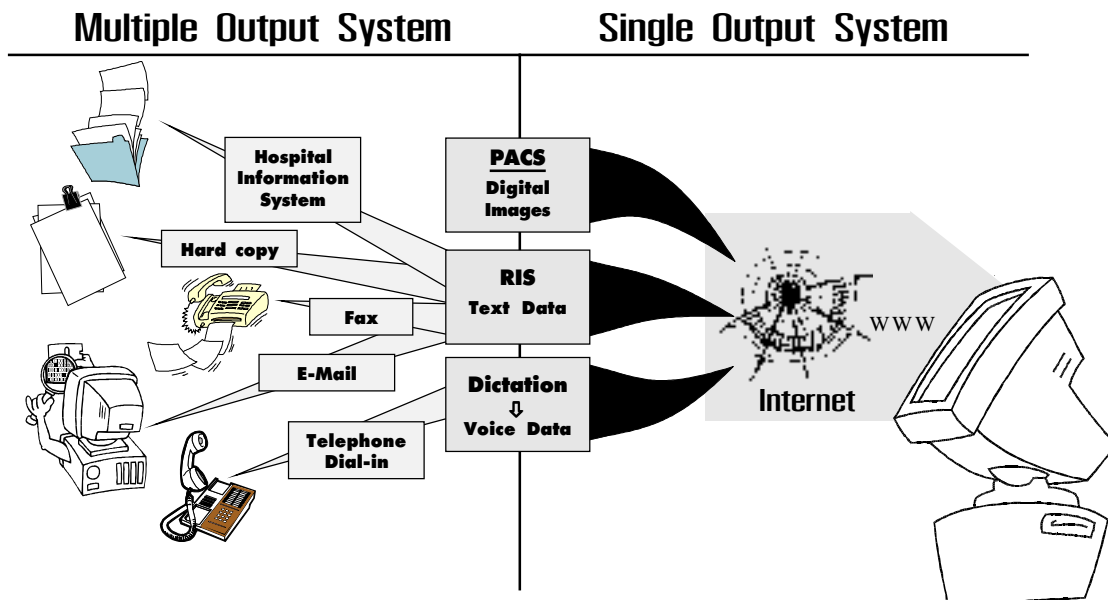


Fig. 3 Multimedia Reporting⁽⁸⁾ (Figure was re-created to improve printing quality - editor)

From this system, it is no need for film(filmless). The database can be created and stored. According to Dr. Parker's report there are three objectives for Web-based Nuclear Medicine i.e.,

1. Integrate NMIS and PACS using the World Wide Web
2. Provide Multimedia Reports
3. Implement High Speed Tele Nuclear Medicine

Dr. Parker also classified the environment for this system as follows;

NMIS - Nuclear Medicine Information System (Fig. 2)

1. Server: Legacy, VAX 4100/VMS
2. Database: RMS
3. Display: X-windows & Character cell
4. Vendor: Developed in house

The last part is the results of this system. The report is presented by using multimedia. (Fig. 3)

There are some other reports about the internet in Nuclear Medicine such as the

use of teaching file software (TF-Web) for local and remote network sites written by Wallis JW et al.⁽⁹⁾ In 1995, O'Doherty MJ et al.⁽¹⁰⁾ reported the computer-based 'home office' for the home reporting for the nuclear clinician. They have used a 486 PC with a high-resolution screen and software provided by LINK Medical Ltd. to obtain images from hospital sites using a modem link to ADAC, Bartec and Nuclear Diagnostic SUN workstations.

In 1996, Parker AJ and other experts from the computer and instrumentation council internet focus group⁽¹¹⁾ reported the works on case-based teaching file, the sampling of world-wide-web sites, etc. They also showed the computer and instrumentation council homepage which was on the location as follows;

gamma.wustl.edu/tf/caic.html

Finally, I hope this review will give you some ideas and some news in Nuclear Medicine for our members.

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