The first Japanese implementation of IHE-ITI EUA/PSA and the Impact of Visual Integration

Yutaka Ando[a], Masami Mukai[a], Takumi Tanikawa[a], Shoji Hongo[a], Takashi Nakashima[b], Yasuaki Hayashi[c], Hiroyuki Sonoda[d], Shoei Takada[e], Noriomi Suzuki[f], Yoshiaki Hayatsu[g], Masayoshi Seki[h]

a *Medical Informatics Section, National Institute of Radiological Sciences, Chiba, Japan,* **b** *Medical Information Technology Division, Hitachi Medical Corporation,* **c** *Health Care Solutions Unit, Fujitsu Limited*
d *TechMatrix Corporation* **e** *Medical System Business Div., Fujifilm Corporation*
f *Life Science Division, Infocom Corporation*
g *Chiba branch, Nippon Telegraph and Telephone East Corporation*
h *Global For Corporation*

Introduction

- Our hospital is specially designed for the heavy particle radiation therapy. Systems (HIS, PACS, clinical database and schedule management system) are running. Some systems were recently replaced. Then we made a modification to use the IHE ITI profiles.
- We planed to study the effectiveness and availability of IHE[1][2] IT-Infrastructure profiles in the Japanese environment. The final aim is to evaluate the availability of the integration profiles in Japanese environment.
- We expand the function of the EUA and PSA, because one clinical unit includes 2-3 personal computers in the outpatient clinic and the ward. We defined the context area for the context manager defined by the HL7 CCOW (Clinical Context Management Specification)[3]. We developed the middleware to realize the function of the EUA (Enterprise User Authentication) and PSA (Patient Synchronized Applications).

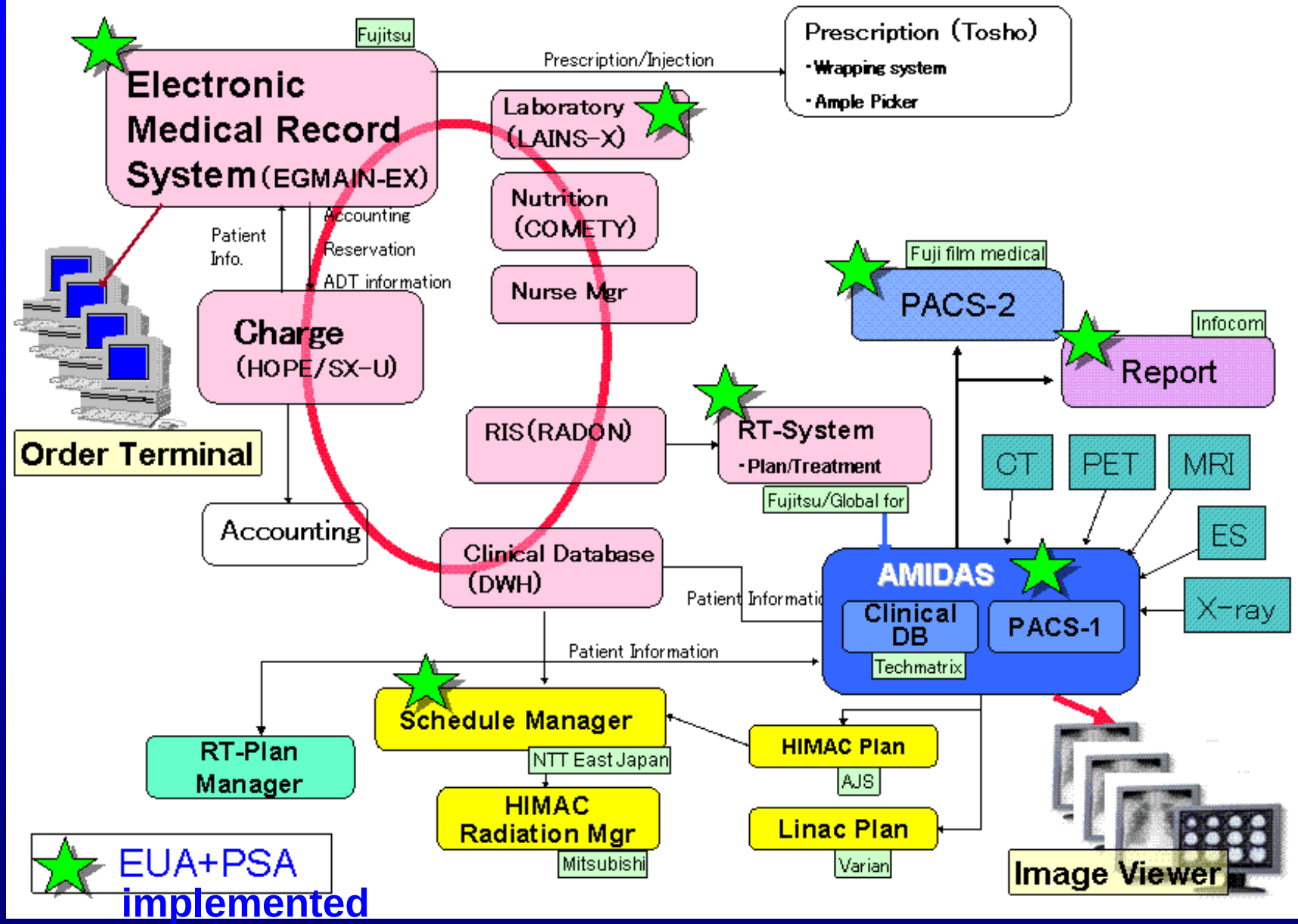
National Institute of Radiological Sciences Hospital

- Located at Inage, Chiba
- Beds for inpatients: 100 beds
- Outpatients: 70-100 patients/day
- Specialized for a radiation therapy with the heavy particle
- Film-less environment (August 2005)

Purpose

- To evaluate IHE IT Infrastructure Integration Profile (EUA, PSA, CT)
- To adapt the EUA and PSA to the Japanese clinical environment
- IHE IT Infrastructure Profile:
  - EUA: Enterprise user authentication
  - PSA: Patient synchronized application
  - CT: Consistent time

Hospital Information System in NIRS October 2006

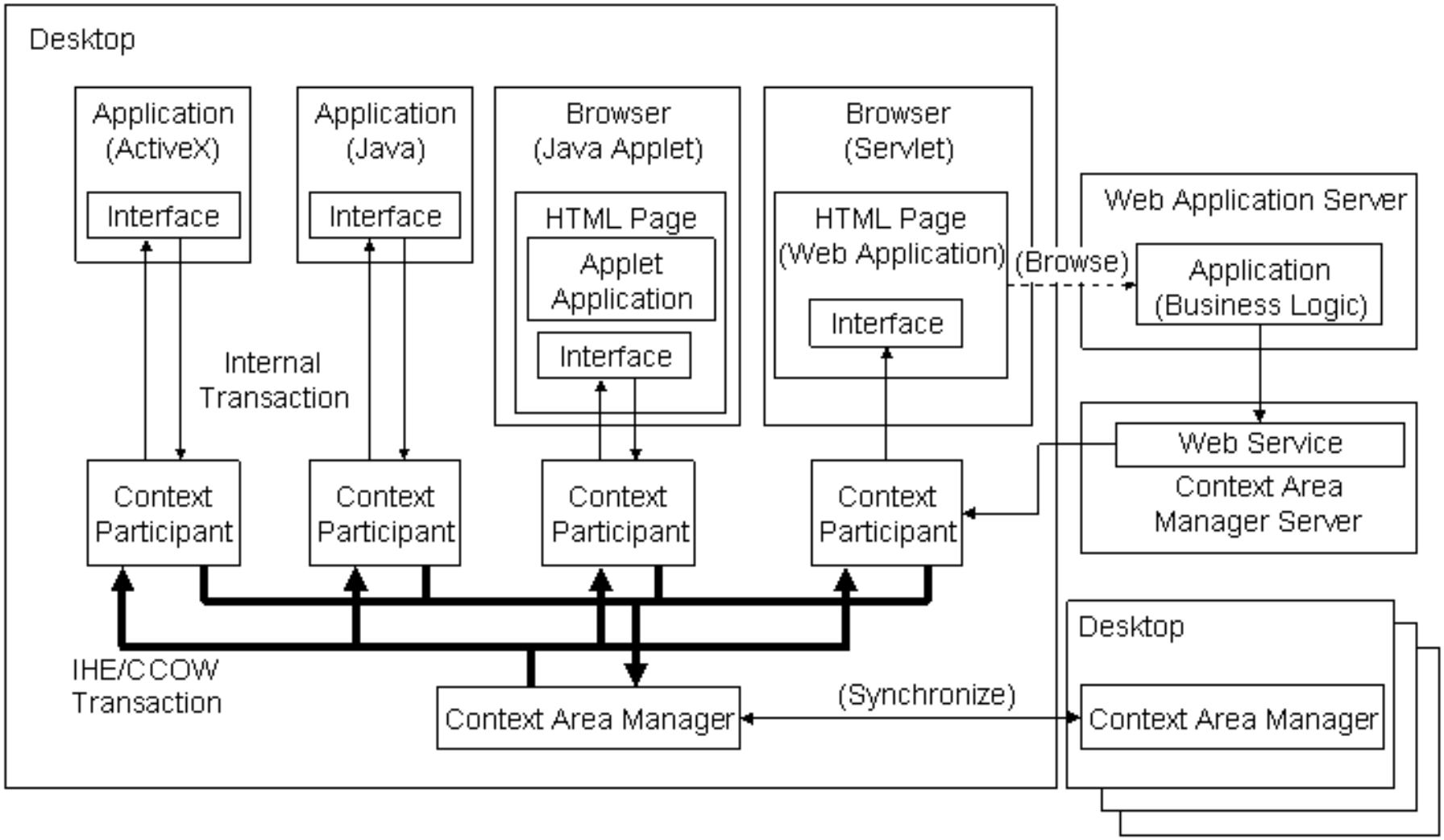


Target Systems

- (1) EMR: HOPE/EGMAIN-EX C/S Edition®, HOPE/DrABLE-EX®, HOPE/LAINS-PC® (Fujitsu)
- (2) PACS-1: SDS-DicomViewer® (TechMatrix)
- (3) PACS-2: SYNAPSE® (Fujifilm)
- (4) Report system: F-REPORT® (INFOCOM)
- (5) RO-RIS: RIGIA (Global-for)
- (6) Radiation schedule system: RSS (Nippon Telegraph and Telephone East)

These six systems were adapted by each vender.

Configuration of the context area manager and the relationship between the context area manager and applications



Methods

- We developed four types of EUA/PSA middle-wares (ActiveX application, Java application, Java applet and Servlet).
- We use this middle-ware to communicate the context area manager each other. We analyzed the flow of the applications. We implemented the function of the EUA and PSA into the existing applications.
- Next we established guidelines for the implementation of the EUA/PSA. The venders of the existing systems modified their applications according these guidelines.
- We evaluate the functionality of the EUA and PSA by using the each application.

Result

- Our EMR has been running since October 2006 and uses the ActiveX module. PACS-1 uses the Java module. PACS-2 uses the ActiveX module. The Report uses ActiveX. The RSS uses the Java applet. RO-RIS uses the ActiveX. No system uses the Servlet module.
- We set up the context area in our hospital. There are 23 context areas in the out-patient clinic and wards. Each context area covers several applications (EMR, PACS-1, PACS-2, Report, RSS and RO-RIS). Each context area consists of 2 personal computers, one which is used mainly for EMR and the other which is used mainly for the PACS/Report application and RSS application.

Discussion

- We wanted to reduce implementation problems and to unify the application interfaces: middle-ware could resolve these problems. We prepared guidelines for modification of the workflow. These guidelines include icons that indicate the status of an application.

- The validity of the enhanced context area was confirmed. In the future, the necessity of t visual integration will increase, and the unified procedure for visual integration is very important.
- The EUA/PSA defined by IHE ITI uses CCOW version 1.4, which defines the patient subject as the patient ID. CCOW version 1.5 defines detailed information about a patient such as DICOM objects.

Conclusion

- We developed four types of EUA/PSA middle-ware. Each application used suitable middle-ware for running environments and also enabled the simple implementation of a single sign on and patient selection.
- We modified six existing information systems to use the EUA/PSA middle-ware. These modifications require the considerable effort, but otherwise we achieved good seamless operation by the EUA/PSA functions. We believe that the EUA/PSA function will be indispensable for multi-vender information systems and useful for clinical safety.

References

[1] EUA/PSA integration profile, Integrating the Healthcare Enterprise. website http://www.ihe.net/Technical_Framework/index.cfm#IT

[2] ITI Integration Profile, website http://www.ihe.net/Tecnical_Framework/index.cfm#IT.

[3] Clinical Context Management Specification Version 1.4, The Health Level Seven, ANSI/CMS, V1.4-2002.

Address for correspondence

Yutaka Ando MD E-mail: ando_y@nirs.go.jp
Medical Informatics Section,
Research Center Hospital for Charged Particle Therapy,
National Institute of Radiological Sciences

4-9-1, Anagawa, Inage-ku, Chiba, 263-8555, Japan