A Web-based Data Management System for Ubiquitous Bio-signal Data Monitoring

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Research Purpose

- **Development of ubiquitous bio-signal telemonitoring system**
  - **Using standard exchange format**
  - **Using efficient web technologies**

Motivations

- Necessity of medical information standardization
  - To reduce medical error
- Convenient practical use of medical information
  - Dynamic manufacturing and administration of patient information and measuring information of medical devices
- Application and development of standardization technology
  - HL7 : A standard for the exchange of electronic data used in medical environments
  - MFER : A JAHIS (Japanese Association Health Information System Industry) standard for waveform data

Overall Scenario

Home Monitoring Devices

Data

Ubiquitous Home Server

Standard (HL7, MFER)

BIRD

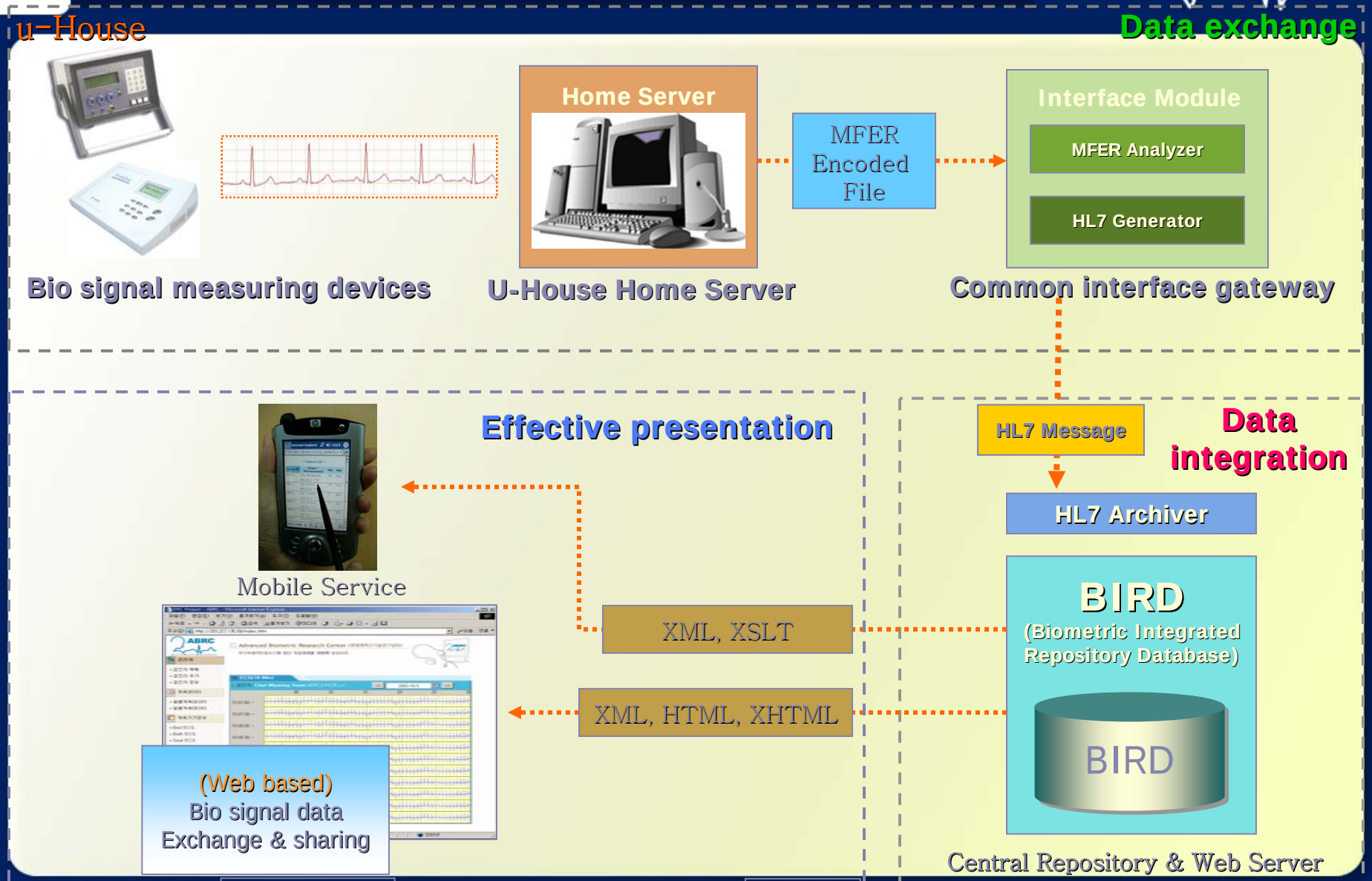
(Biometric Integrated Repository Database)

XML,HTML,XHTML

Internet

Web based Medical Information Sharing

Data Exchange Through Gateway

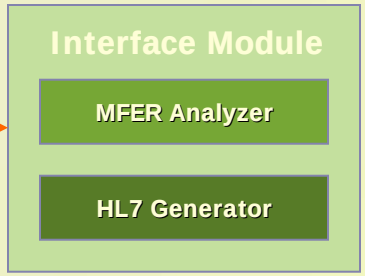


Device Interface

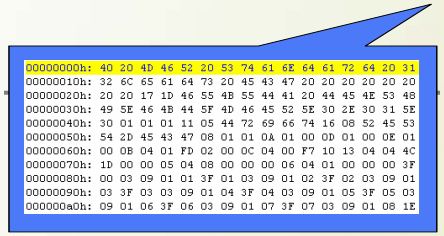
u-House

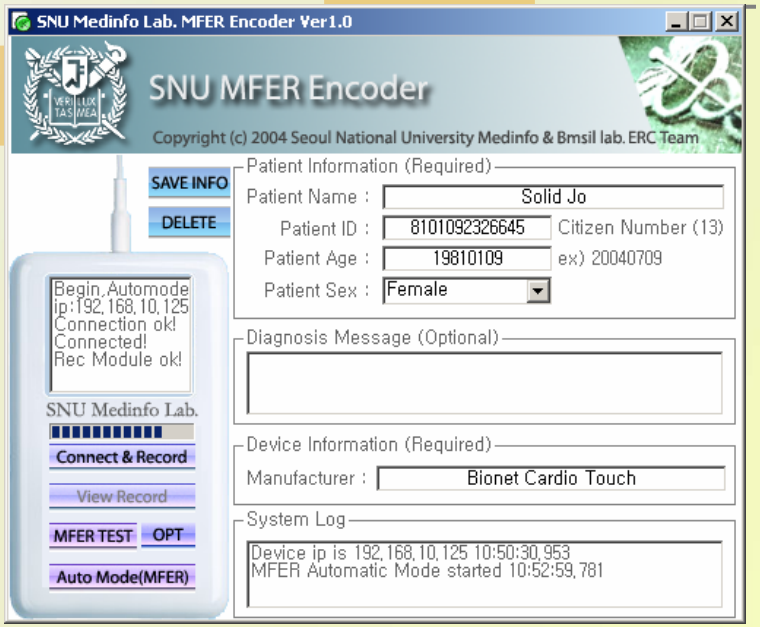
Data exchange

MFER Encoded File



Common interface gateway

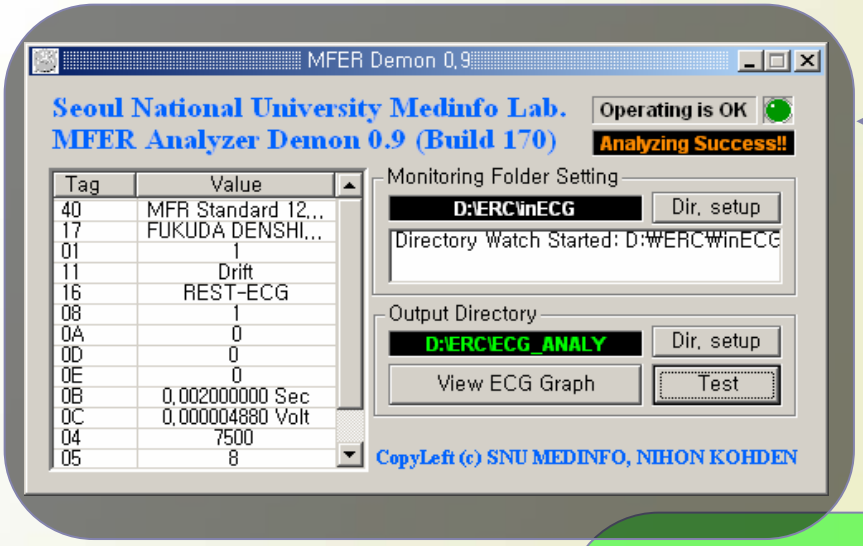




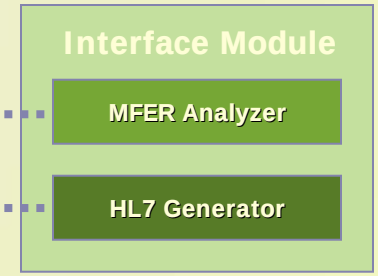
MFER Encoder

For device interface, we developed MFER Encoder that encodes waveform data into the MFER standard format.

Gateway

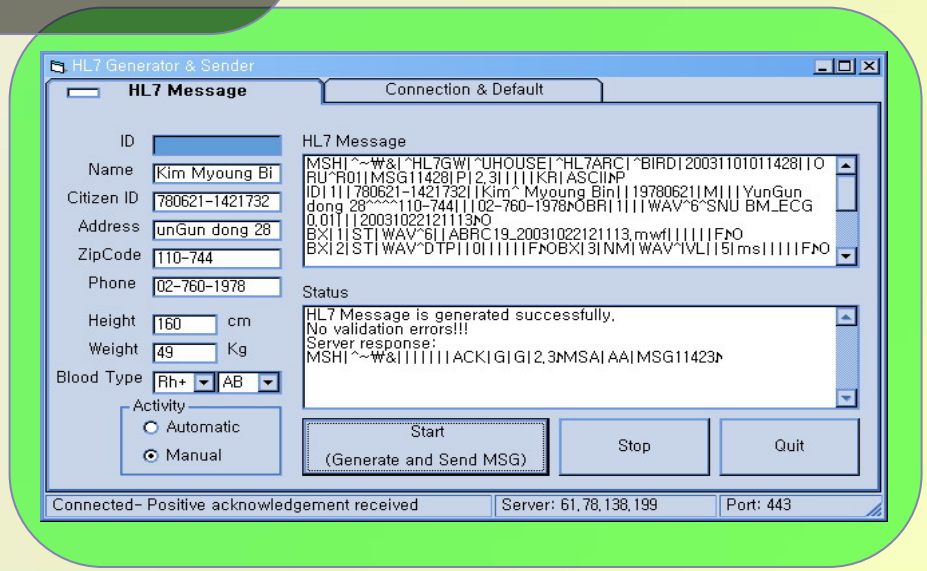


MFER Analyzer



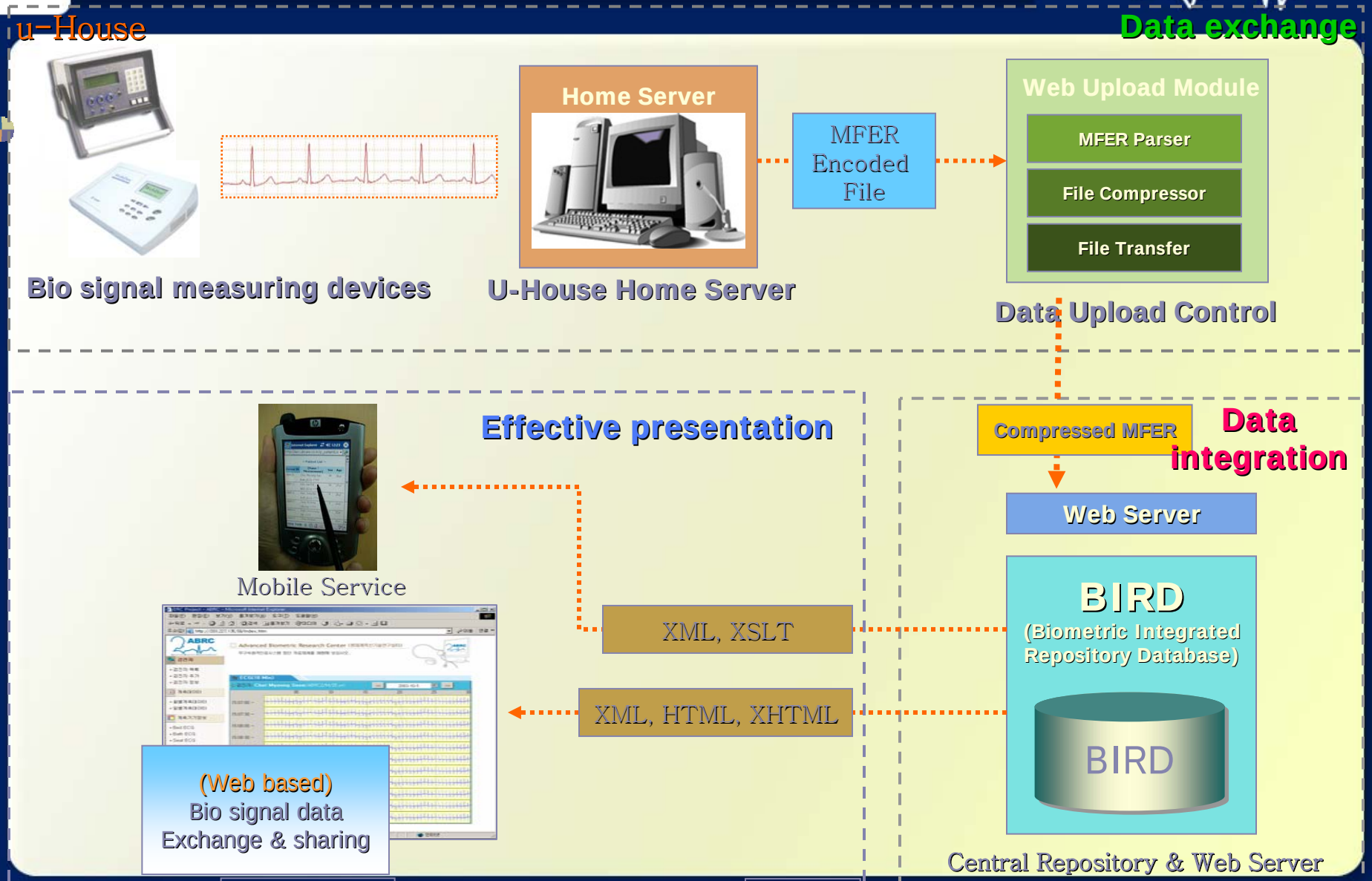
Common interface gateway

HL7 Generator



Gateway sends the patient information and the metadata for the measured waveform data into the HL7 standard format.

Data Exchange Through Web



Web-based Data Upload

- The Web-based data upload is our enhanced mechanism for transferring waveform data
- We designed it as a client-side ActiveX control
- Waveform data is transferred into the compressed MFER form
  - To speed up large file upload

Web Services

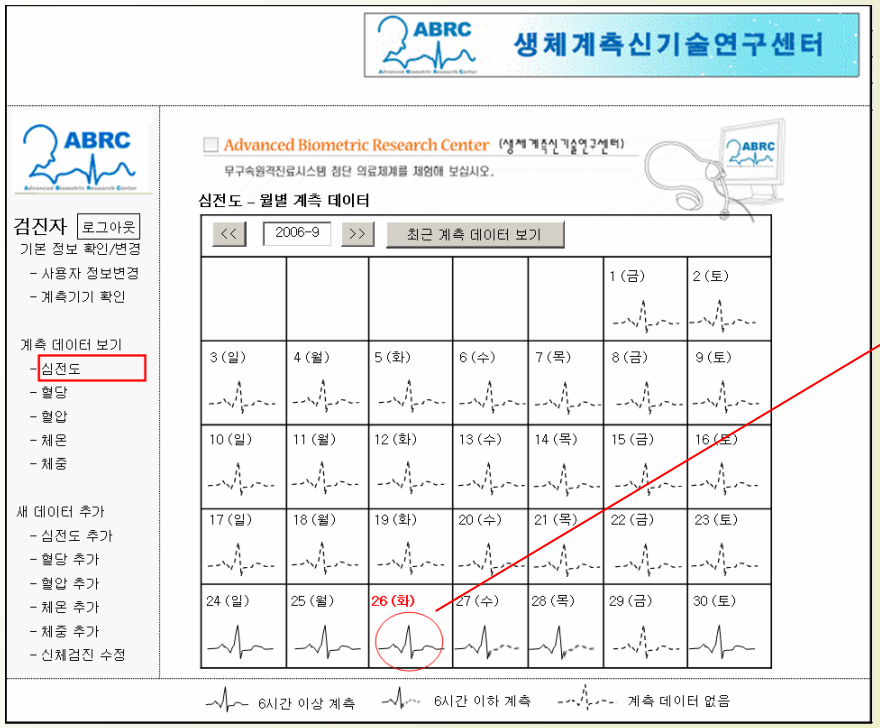
Target Users

- Doctors
  - Review all of the measured data of his/her patients
- Patients
  - Review and maintain their own bio-signal data
- System administrators
  - Register and manage bio-signal devices
  - Manage bio-signal device users

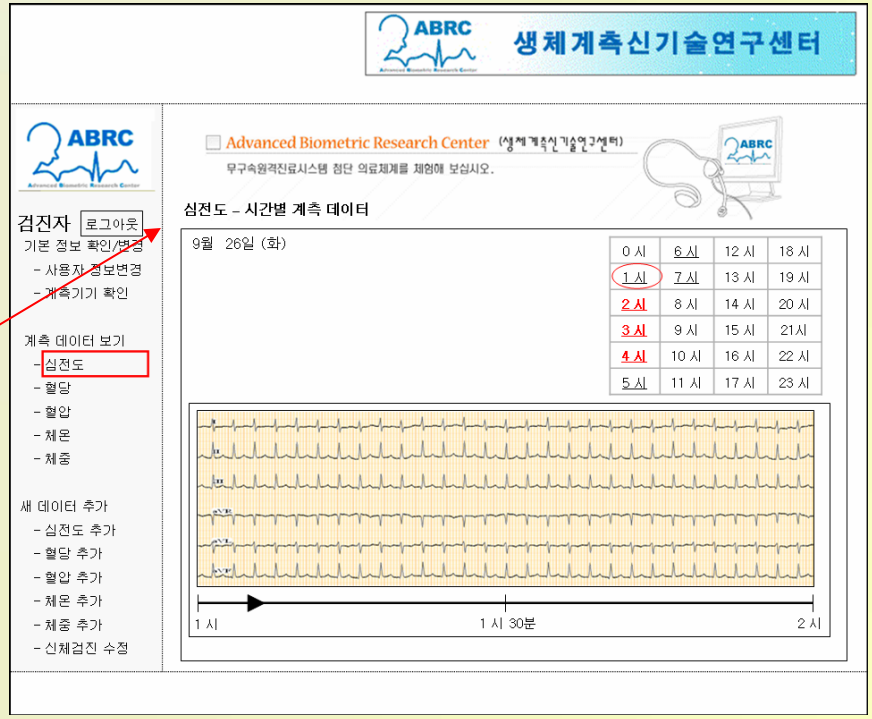
Currently, we are developing our web site using ASP and scripting languages.

Example of Web Services

- Storyboard of ECG retrieval interface



Monthly ECG retrieval storyboard



Hourly ECG view storyboard

Acknowledgments and Contact Details

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