

a WEB-based Health Information System for In and Out-Patients' CARDIOlogy department
(WEBHIS-IPCARDIO & WEBHIS-OPCARDIO)

README

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WEBHIS-IPCARDIO Release 0.1 may 2005

The web-based health information system was designed to give answers to physician/nurse data management needs in a distributed cooperative environment. Two modules are released. The first is specialized to handle in-patient's cardiology data, the second out-patient's cardiology data, but a discharge letter may also be produced for convenience. In-patient management is still in the beta phase, so it is provided for testing only. To use it seriously, please wait for the next release.

Extensions to other departments are in progress. A good one is available on request for Pneumology out-patient's.

Requirements: Hardware & Software

- any PC, any operative system supporting Apache, PHP and Firebird/Interbase, any browser. For single user or network unlimited users. Windows XP and Internet Explorer 6 are recommendend for single-user. A Linux server is recommended for multi-users.
- A CD drive to install from the distribution and a floppy drive to log in as administrator.

Installation: The distribution comes with all needed for Windows and for Linux. Installation is performed in two steps: a) server side, to be done even in single-user environment, and b) client side.

a1) server side – only for a Windows machine:

- Apache and PHP are installed together. Run 'appserv-win32-2.4.3.exe' from the distribution CD. Next. Change SetupType to Custom. Next. In Select Components check Apache and PHP only (uncheck the other two). Next. Next. When copying finishes uncheck 'start mySQL' and close.
- Open with a text editor (Notepad) 'php.ini' in the windows folder. Set magic_quotes_gpc=Off and magic_quotes_sybase=On. Delete ';' at the beginning of the ';extension=php_interbase.dll'. Save and exit.
- Copy the whole distribution CD into the folder 'c:\appserv\www'
- Unzip 'SitoWeb.zip' into the folder 'c:\appserv\www' maintaining the subfolder structure.
- Unzip 'pdfClassesAndFonts_009e.zip' into the folder 'c:\appserv\www' maintaining the subfolder structure.
- Open with a text editor (Notepad) 'index.html' in the folder 'c:\appserv\www' and change headers data of your institution. Open with a text editor (Notepad) 'global.php' in the folder 'c:\appserv\www' and set the first six defines to your institution data. These will be used as headers in forms and in clinical reports.
- Install 'InterBase_tIB6_0_2_0' leaving the default settings. Next. I Agree. Next. Next.
- Run IBConsole from the Interbase group. Right click on 'Interbase Servers' and select 'Register ...'. In the 'Register Server and Connect' form leave the radio button 'Local Server' selected, set 'User Name' and 'Password' to 'sysdba' and 'masterkey' respectively. Click on 'OK'. Click on 'Local Server' then go to menu 'database' / 'maintenance' / 'Backup/Restore' / 'Restore'. In the 'Database Restore' form set the following: in the first alias field select 'File...' Browse to the CD drive and select 'Cardiologia.gbk'. In the server field select 'Local Server'. In the second Alias field input something meaningful i.e. 'cardiology'. In the Filename(s) field digit 'c:\sql\cardiologia.gdb' (*). Click OK. This will restore the database from the backup. Wait until 'Database restore completed'. OK. Close. Close IBConsole.
If interested to test in-patient's software, please repeat the restore procedure for the 'db_degenza.gbk' to be restored to 'c:\sql\db_degenza.gdb' (*).
Note (*) = if you change the default path or database name, the same modification must be done in the 'global.php' and 'degenza/Global.php' files. Be sure the path exists!

a2) server side – only for a Linux machine: (note that we used MandrakeLinux 10.0)

- basic setup of the Linux OS:
 - o do not install any WEB server, will be done later
 - o ftp, mail, ecc.. are not needed
 - o do not install any Database server, will be done later
- Install the following from the distribution CD:
 - o 'Firebird*' (server SQL)
as root; default settings
 - o 'httpd*' (server WEB Apache2)
as root; gzip -d httpd*, tar xvf httpd*, cd httpd*, ./configure --enable-so, make, make install
 - o 'php*' (script preprocessor .php)
as root; gunzip php*, tar -xvf php*, cd php*,
./configure --with-apxs2=/usr/local/apache2/bin/apxs --with-interbase=/opt/firebird
--with-iconv=/usr/bin,

make, make install, cp php.ini-recommended /usr/local/lib/php.ini
edit last file to set 'magic_quotes_sybase=On'.

edit /usr/local/apache2/conf/httpd.conf. set DocumentRoot to
"/var/www/html".

add "AddType application/x-httpd-php .php .PHP". Save and exit.

N.B.: the parameter '--with-iconv=/usr/bin' in the ./configure script is needed only to share data between linux and windows applications (it converts the charset to dos). If not needed, omit it and remember to edit later the file 'global.php' to uncomment the three lines relative to the 'iconv' function definition.

- o in /etc/rc.d/rc.local add before any other command:
"/usr/local/apache2/bin/apachectl start" to make Apache running at startup.
- o Expand 'sitoweb.zip' and 'pdfClassesAndFonts_009e.zip' in /var/www/html.
- As root set privilege 777 to /var/www/html.
- Personalize /var/www/html/index.html and /var/www/html/global.php (remember the 'iconv' definition if needed!)
- The database restore may be done at the server, or at a Linux client, by using Flamerobin (expand 'Flamerobin*' from the distribution CD; this requires a graphic interface installed), or at a Windows client, by using IBOConsole (expand 'IBOConsole' from the distribution CD).
-> with Flamerobin <-: Right click on 'Firebird Servers' and select 'Register server ...'. Specify Hostname 'localhost'. OK. Right click on 'localhost' and select 'Create new database ...'. In the field 'Database path' set '/sql/Cardiologia.gdb' (*); username 'sysdba' and password 'masterkey'. Create. Right click on '/sql/Cardiologia.gdb' and select 'Restore database ...'. Browse to the backup file 'Cardiologia.gbk' on the distribution CD. Check 'Replace existing database'. Select Page Size '4096'. Restore. If interested to test in-patient's software, please repeat the restore procedure for the 'db_degenza.gbk' to be restored to '/sql/db_degenza.gdb' (*).
Note (*) = you have to change the database path or filename also in the 'global.php' and 'degenza/Global.php' configuration files.
-> with IBOConsole <-: This program is quite the same as IBCConsole. Follow the instructions found in the preceding windows section. (you have to register the server instead of localhost)

The OPCARDIO restored database contains two default users: TEST (password 80369558) that allows to work only with the patient 'PAZIENTE DI PROVA' and can be put on the public domain for test purposes, and ADMIN (the corresponding password can only be read from the file 'webhis.pss' coming with the distribution CD. Copy this file to a floppy disk and label it as "WEBHIS password admin". If your machine doesn't have a floppy drive, or if the path is different from '/mnt/floppy', please copy the file to the folder '/mnt/floppy'). The IPCARDIO restored database contains two default users: test (password test1) that allows ordinary work, and admin (password admin1) for administration of the site.

Reboot to be sure all is upgraded!

b) client side (may be the server, too):

Open the browser and go to the home page (digit 'localhost' in the address bar if access is local to the server, or digit the server name or IP address if access is remote from a PC client). The home page "Benvenuto nel sito WEB dell'U.O. di Cardiologia" comes. If not, a problem with the server Apache or the network should be fixed.

To have full capabilities (Java must be enabled to read the password from the floppy disk.

This may be limited only to the first access by the ADMINISTRATOR) on a Windows PC, you need to install the advanced options. On Linux skip this step. Click on 'scarica ed espandi il file ...'. Save it into a temporary folder. Expand (*) the file and run 'aggsito.bat'. Wait until finished (**). For Windows 95/98/ME restart the PC.

Note: (*)= Not having XP nor Winzip. Download 'scarica ed installa WINZIP95'. Restart the PC.

(**)= Windows may show the following message: 'Spazio per le variabili d'ambiente esaurito'. If so you have to edit 'c:\config.sys' and insert the following line at the top:

```
Shell=c:\command.com /e:4096 /p
```

Save, Restart the PC and repeat.

For Windows PC only: to have full capabilities Internet Explorer 6 is required. Download the upgrade from the home page and install it (but first DO A BACKUP of Outlook Express database and of agenda if you have email in use on the machine. In that case it may be necessary to import the email database in Outlook Express 6 after installation). Verify to have Java and JavaScript support. If you have Windows XP service pack 2 (released by Microsoft without JRE), or simply do not have a Java Virtual Machine installed, download 'Java 2' from the home page and install it. If there is not Acrobat Reader installed download 'se non funziona "visualizza pdf" scarica ed installa ACROBATE READER 5'.

When completed this first setup step, click 'Gestione Pazienti Cardiologici' to access the login page of the OPCARDIO. If the login page doesn't come a problem with the server side installation of php exists.

At the bottom-left of the page should '1) carica password da floppy' appear. If not, if you installed Java from the distribution or had Sun Java already installed, add the following string at the end of the address bar: '?jre=sun', immediately after 'login.php'. Repeat the command. If '1) carica password da floppy' still doesn't appear something was wrong with the installation process of the java environment or of the advanced options. Please check the steps and retry.

Insert the floppy disk labelled "WEBHIS password admin" and click on '1) carica password da floppy'. Wait a few seconds. A message like '... lettura terminata ...' should appear in the applet box. Click on '2) trasferisci password'. Eight dots (or asterisks) should appear in the Password field. Click on '3) clicca per inviare'.

A new page labelled 'MODULO DI IMPOSTAZIONE UTENTI' should come. If not, a problem with the server Firebird/Interbase exists. Please verify the content of 'global.php' and 'php.ini'.

In this form you may add/edit users, passwords and privileges. It's now time to add a new user with full privileges on the database. Click on 'Aggiungi nuovo'. A new blank form comes. Digit the field 'Utente' with the username, the field 'livello' with 5 (that means full access to clinical report production; note that level 1 means read-only), 'password' and 'ripeti password' with the password of your choice. Warning: the password will be crypted and stored into the database. There is no way to read it back. If the password is later forgotten by the user, a new one should be entered in this form by the administrator. Click on 'salva modifiche'. A dialog 'dati salvati correttamente' should appear. Simply click OK.

Click 'Fatto! Esci' to go back to the login page. Digit the new username and password in the fields 'Utente' and 'Password' respectively. Click on '3) clicca per inviare'. A new page with the button 'Seleziona il paziente in anagrafica' should appear. The authentication procedure was successful.

In multi user environment, test the connection to the login page from all other clients on the network. Set the address of the login page in the preferred or as home page.

Screen resolution should be at least 1024x768.

Site settings:

As reported before, localization is performed by editing the 'global.php' file on the server. There you can find strings for form and clinical report headers, as well as paths and other setup constants.

Another localization is needed at least for Physician names and for regional codes, needed during clinical report production. To do that, log in as administrator and, in the 'MODULO DI IMPOSTAZIONE UTENTI' form click on 'Entra tabelle' at the bottom left of the page. In the following page, in the combo-box, select 'FIRMA' and click on 'Edita'. This allows to store the physicians working in the institution, for combo-box selection at the end of clinical report writing. Act on 'Nuovo ...' and 'Salva' to enter records. With 'Edita' you can modify a stored record. In the 'CODICE' column specify the code (a mnemonic three character, uppercase, unique), in the 'DECODIFICA' column specify the physician Last, First name. When finished, click on 'Chiudi'.

Repeat the same procedure for table 'PROV_' to store identification code and description of the departments of the hospital and of out-patients area codes. This allows to specify, by a combo-box selection, where the patient comes from at the moment of clinical examination, useful for statistical analysis of the database.

When finished, click on 'Chiudi'.

Log in as administrator again and, in the 'MODULO DI IMPOSTAZIONE UTENTI' form click on 'Entra chiavi' at the bottom right of the page. In the following page, in the combo-box, select one table at a time and click on 'Edita'. This allows to prepare a set of predefined sentences, for combo-box selection during clinical report writing. Act on 'Nuovo ...' and 'Salva' to enter records. With 'Edita' you can modify a stored record. In the 'N' column specify a unique numeric, in the 'DESCRIZION' column enter the text. The special symbol ';' will be translated to Enter key when the sentence will be used. The special symbols '[' may be used to delimit a piece of text that will be rendered in bold when printing a clinical report.

When finished, click on 'Chiudi', then close the browser.

OPCARDIO Usage:

Open the browser and go to the site address. Click 'Gestione Pazienti Cardiologici' to access the login page of the OPCARDIO.

Digit the username and password, given by the administrator, in the fields 'Utente' and 'Password' respectively. Click on '3) clicca per inviare', or press <Enter> key. The page with the button 'Seleziona il paziente in anagrafica' should appear. Click on that. In the following page, digit last and first name of the patient, or part of them. Press <Enter> key. A list of patients appears (if you entered the test password 80369558 the only patient showed is 'paziente di prova'. This for security). Click on the corresponding link.

If the patient is a new one for this system, click on 'Inserimento nuovo paziente'. Put patient's data in the form, then click on 'Salva'. OK. Close.

In both cases, a form with the main menu appears. Click on 'Visualizza schedina paziente' to obtain a report of the clinical history of the patient, if any yet stored.

Click on 'Accesso alla refertazione' to go to clinical report production. A form with all type of clinical report comes. Each row has the button 'Nuovo' that allows to insert a new report; the button 'Visualizza' that means read-only; the button 'Edita' that allows editing of the report.

On 'Nuovo' you may be requested 'Utilizzo come base il testo del referto precedente'.

Answer 'Annulla' to start from scratch, or 'OK' to start from the previous one of the patient, if any.

Data entry is organized in multiple forms. The navigation bar may help. You may use keyboard controls as well (Pag up, Pag dn, Enter, ESC, rows ...). Pag dn enables the spell checking (only italian dictionary at the moment!! In Windows, if the advanced options were

installed and if this procedure is tedious for you, please delete the file 'c:\class\dizionar.txt').
Predefined codes may be selected in combo-box.

Predefined sentences may be inserted by the combo-box 'TASTI PREIMPOSTATI – seleziona una voce' located under textarea controls.

When finished editing, click on 'Salva' to store data, or click on 'Chiudi' or press the ESC key to abort. A confirm dialog may appear. 'Sono state fatte delle modifiche alla refertazione. Abbandonare comunque?'. Click on 'OK' to abort editing, on 'Annulla' to go back.

The browser opens the clinical report in a new window. It is possible to select the previous one and go to the clinical summary, or even open another report, to copy and paste some interesting text. Copy and paste is obviously possible from any other document, so you may define your own sentences, if needed.

To produce a printable document PDF format is adopted. A button 'visualizza PDF' is always available to do this task. Click on the button and wait until the PDF document is opened by the browser (i.e. Acrobat Reader in Windows, Xpdf in Linux), then print by using the printer icon of the toolbar of the PDF viewer, not the icon of the browser!

In Internet Explorer, use the '← back' icon of the toolbar of the browser to exit Acrobat Reader and go back to the previous form (note that this is the only place you need to do this way).

To go back, click on the 'chiudi' button of the form, if any, instead of the '← back' icon of the toolbar of the browser. Try never to close the form with the border icon 'X'!

To safely log out, close the browser.

Do regular backups of the database by using the Interbase/Firebird client (IBConsole, IBOConsole or Flamerobin) to obtain a 'cardiologia.gbk' file to be stored offline.

IPCARDIO Usage:

Open the browser and go to the site address. Click 'Gestione UTIC-Degenza' to access the login page of the IPCARDIO.

Digit the username and password, given by the administrator, in the fields 'Utente' and 'Password' respectively. Select the ward and click on 'Entra'. The page with the beds should appear. Click on one of them. If empty, do a search of a new patient (any arbitrary string in the fields 'cognome' and 'nome'; click on 'Ricerca alfabetica'). An empty list appears; click on 'Inserimento manuale dei dati anagrafici'. If taken, this step is skipped.

In both cases, a form with a main menu on the left appears. Use links to navigate patient's data.

Four phases are defined: 'Dati ingresso' to collect demographic and previous data, 'Accettazione' to collect admission data, 'Degenza' to collect period in-hospital data and 'Dimissione' to collect discharge data.

To save changes click on the 'Salva' button, at the bottom left.

To produce a printable document PDF format is adopted. The link 'Anteprima Lettera' is available on the left menu. Wait until the PDF document is opened by the browser (i.e. Acrobat Reader in Windows, Xpdf in Linux), then print by using the printer icon of the toolbar of the PDF viewer, not the icon of the browser! When finished close the window. The '← back' icon of the toolbar of the browser is disabled. Never try to use it with IPCARDIO!

To safely log out, close the browser, or simply click of the 'Cambia Utente' link.

Do regular backups of the database by using the Interbase/Firebird client (IBConsole, IBOConsole or Flamerobin) to obtain a 'db_degenza.gbk' file to be stored offline.