

RISPad:

Radiological Information System – notePad

**Implementation of a RIS-PACS compatible handout
Documentation system Into An Existing Examination.**

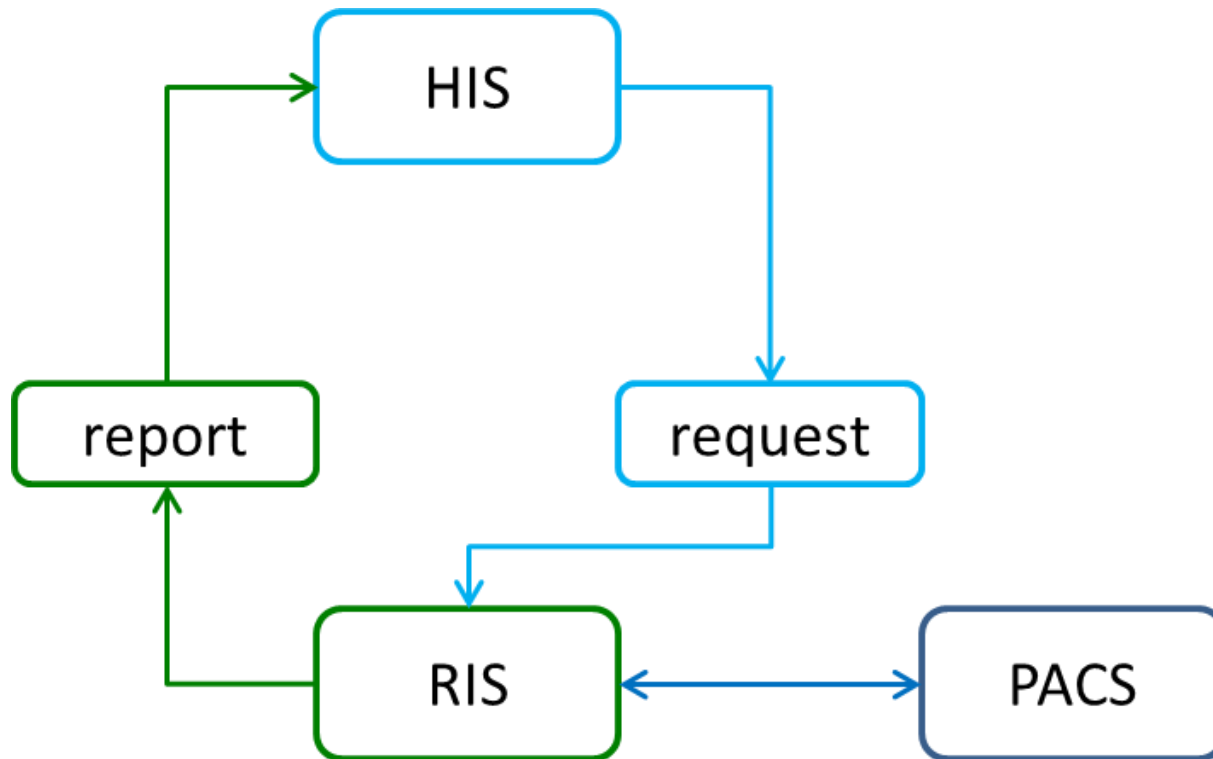
Ganster Barbara and Nasel Christian

Master Course Digital Healthcare (supervisor: Ritschel H.)

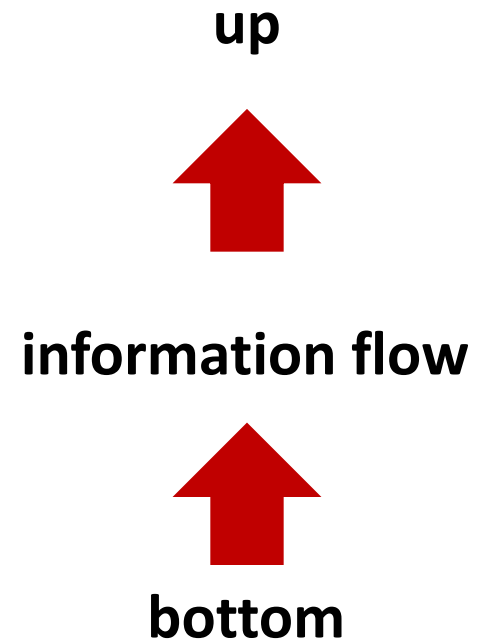


Functionality of the RIS/PACS – HIS interface:

1) *unidirectional*

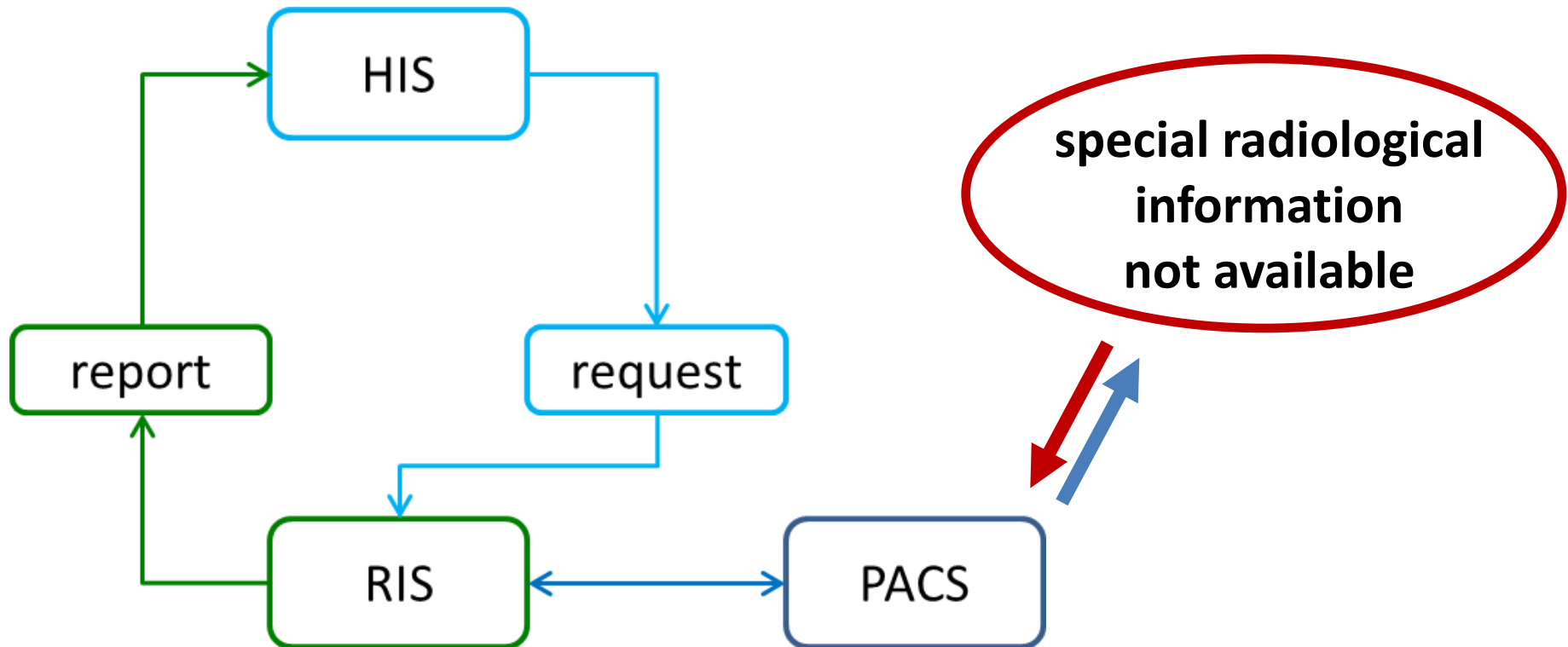


2) *bottom-up*

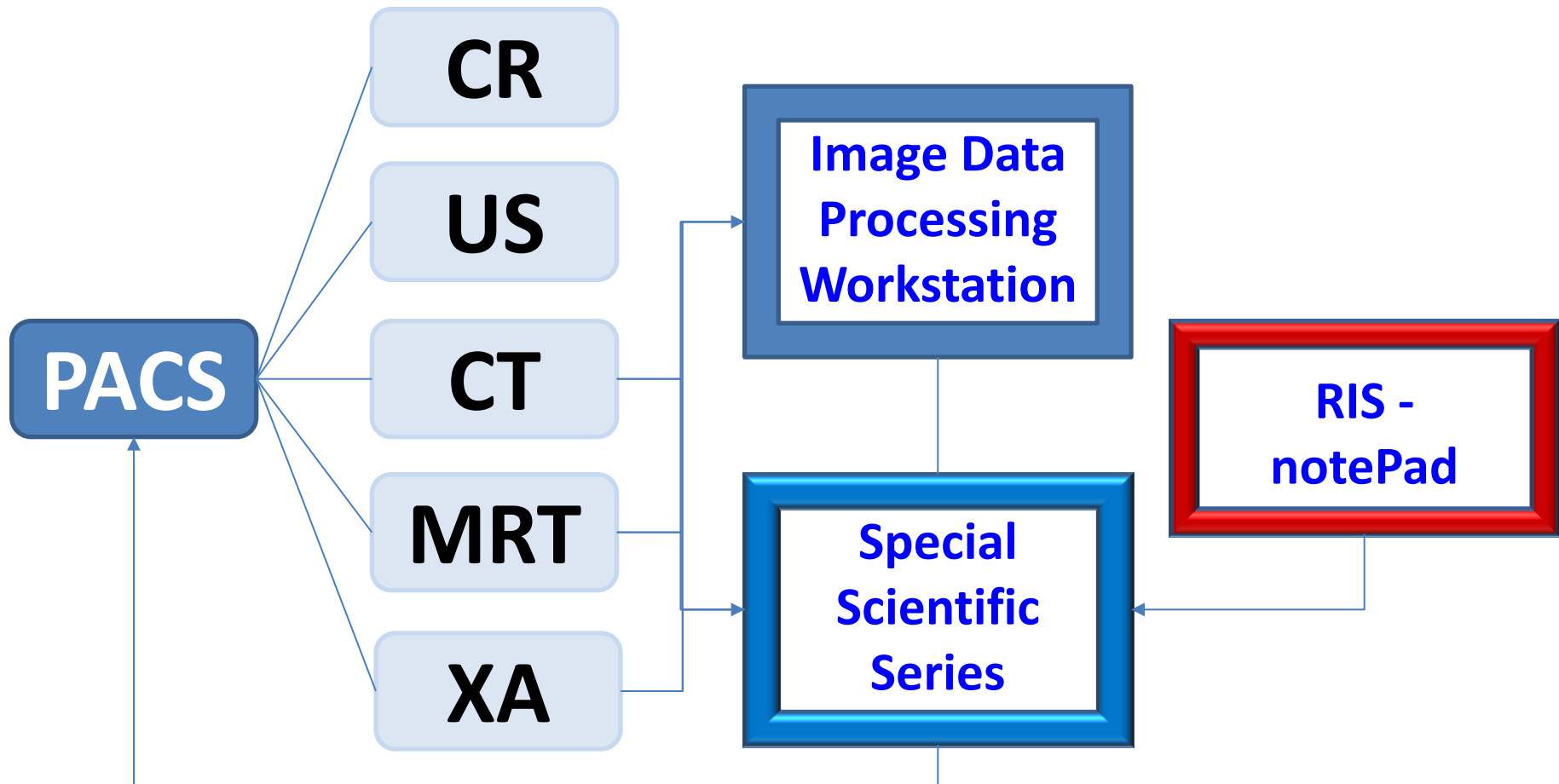


Due to legal regulations some situations would require storing special information along with the image data:

- informed consent
- study-data (numeric or image data)



RisPaD simply implements an interface between the PACS and the study/science specific framework:



RISPAD: *Getting the Data into the PACS*

jPerfusionModule (role: SCU && dicom-ties-demon):

DICOM-send implementation:

JAVA (SE & SDK 7 - 64Bit) → cross platform support

JAVA-IDE: NetBeans (available: <https://netbeans.org>)

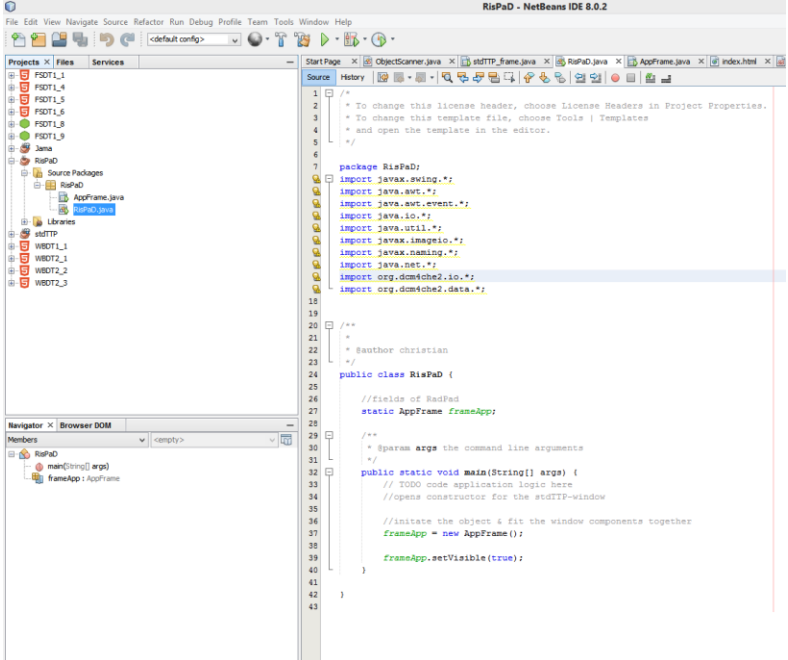
professional developer environment also integrates

JAVA, HTML5 and node.js

JAVA-DICOM-library:

dcm4che.org

(available: <http://www.dcm4che.org>)



```
1  /**
2  * To change this license header, choose License Headers in Project Properties.
3  * To change this template file, choose Tools | Templates
4  * and open the template in the editor.
5  */
6
7  package RisPad;
8  import javax.swing.*;
9  import java.awt.*;
10 import java.awt.event.*;
11 import java.io.*;
12 import java.util.*;
13 import javax.imageio.*;
14 import javax.naming.*;
15 import java.net.*;
16 import org.dcm4che2.io.*;
17 import org.dcm4che2.data.*;
18
19
20 /**
21 *
22 * @author christian
23 */
24 public class RisPad {
25
26     //fields of RisPad
27     static AppFrame frameApp;
28
29     /**
30     * @param args the command line arguments
31     */
32     public static void main(String[] args) {
33         // TODO code application logic here
34         //opens constructor for the stdITP-window
35
36         //initiate the object & fit the window components together
37         frameApp = new AppFrame();
38
39         frameApp.setVisible(true);
40
41     }
42
43 }
```

RISPad-dicom link server: *nodeJS*

integrates:

socket.io [real time message and stream engine]

express [web framework]

daikon [dicom parser]

fs [node's file system]

RISPad-dicom link client: *HTML5-web app*

integrates:

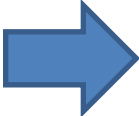
java script – runables for web-DocumentCam

jquery - jTable for jquery

C#-stuff, whenever I did not know what else to do....

RISPAD: *components*

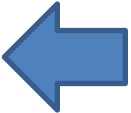
dicom-SCP:
puts dicom-images
from various modalities
into assessment-folder



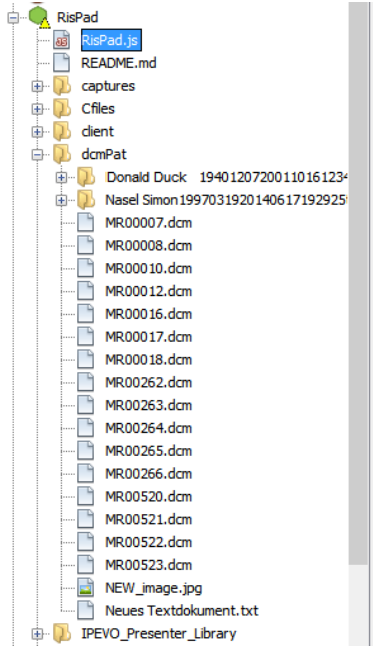
```
scpReceive
C:\xex\scpReceive>rem      localisation storage      AETitle      loc.co
nfig file      datendirectory port
C:\xex\scpReceive>c:\xex\scpReceive\simple_storage.exe -c DIGITAL_JACKET -i -n c
:\xex\scpReceive\my.cfg -s -x c:\SCAN 104
```

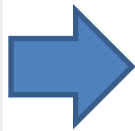
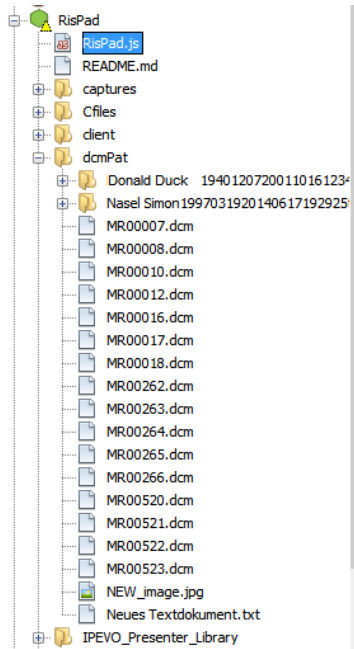


dicom-ties-demon-SCU

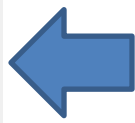


dicom-link-server

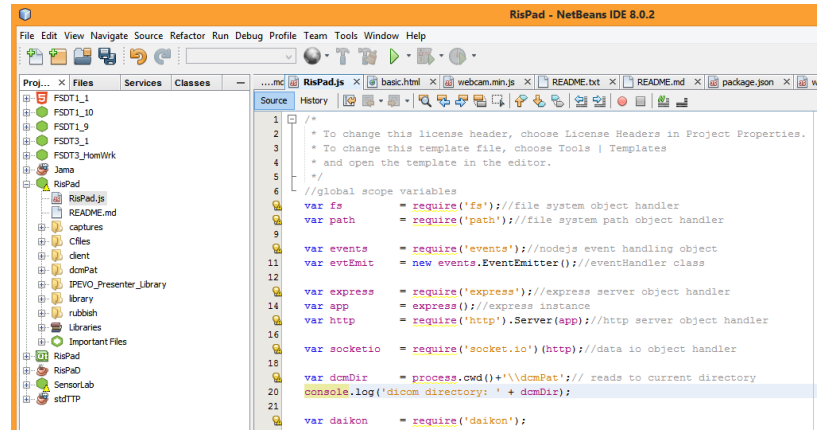




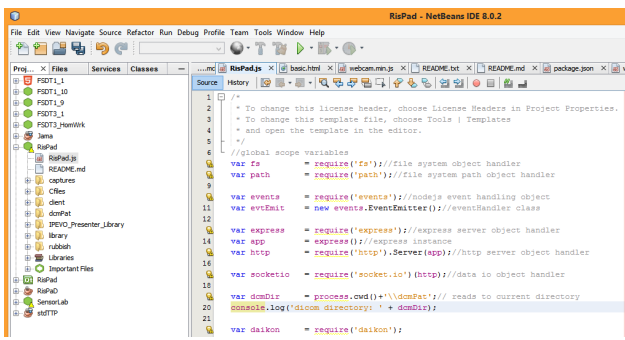
dicom-link-server:
scans assessment-
folder for new
patient-entries



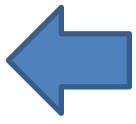
dicom-link-server:
creates new ties for
encapsulation and
dicom-send to PACS



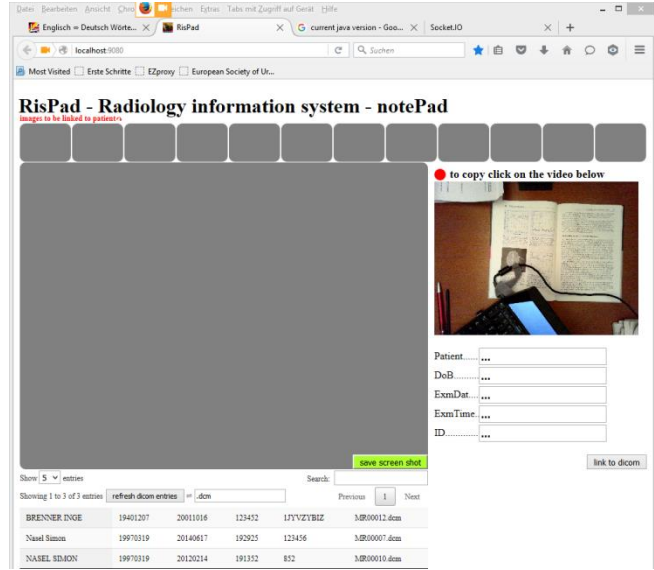
RISPAD: *components*



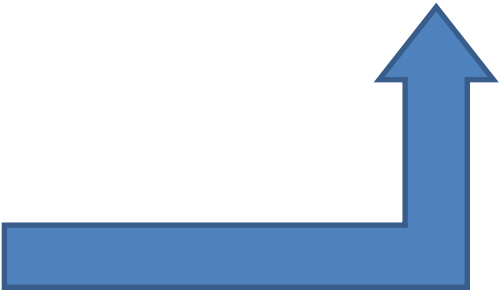
dicom-link-client:
receives patients'
entries



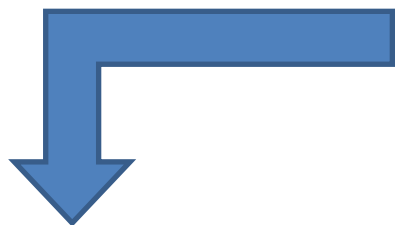
dicom-link-client:
sends doc-images
with dicom link



**USB-camera
document scanner:**
3264 x 2448 pixel
webcam interface
IPEVO ziggy-HDplus

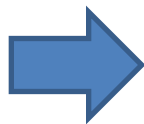
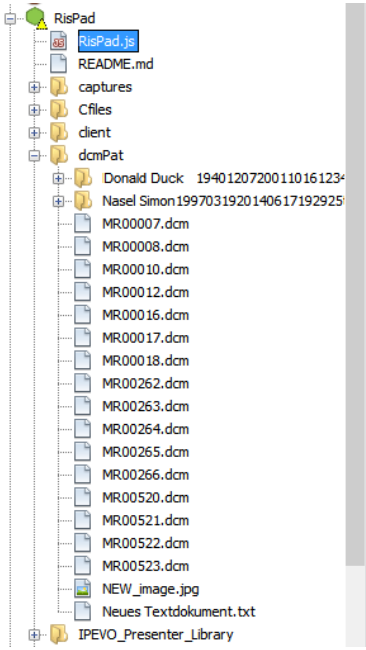


RISPAD: *components*

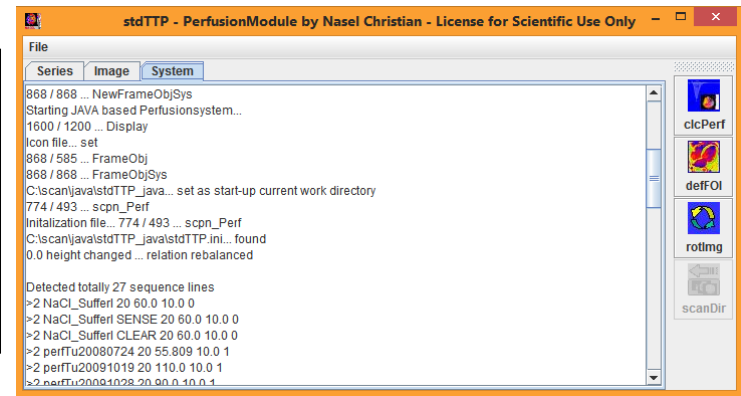


dicom-link-server:
creates new ties for
encapsulation and
dicom-send to PACS

```
1  /*  
2  * To change this license header, choose License Headers in Project Properties.  
3  * To change this template file, choose Tools | Templates  
4  * and open the template in the editor.  
5  */  
6  //global scope variables  
7  var fs = require('fs');//file system object handler  
8  var path = require('path');//file system path object handler  
9  
10 var events = require('events');//nodejs event handling object  
11 var evtEmit = new events.EventEmitter();//eventHandler class  
12  
13 var express = require('express');//express server object handler  
14 var app = express();//express instance  
15 var http = require('http').Server(app);//http server object handler  
16  
17 var socketio = require('socket.io')(http);//data io object handler  
18  
19 var dcmDir = process.cwd()+'\\dcmPat;// reads to current directory  
20 console.log('dicom directory: ' + dcmDir);  
21  
22 var daikon = require('daikon');
```



dicom-ties-demon-SCU:
scans assessment folder
for ties, encapsulates
and performs dicom-
send



PACS

RISPAD: *client - GUI*

RisPad - Radiology information system - notePad

images to be linked to patient ↗



● to copy click on the video below



Patient.....

DoB.....

ExmDat...

ExmTime...

ID.....

save screen shot

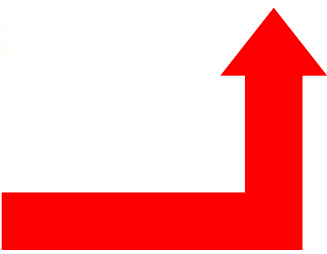
link to dicom

Show entries Search:

Showing 1 to 3 of 3 entries refresh dicom entries = .dcm Previous 1 Next

Donald Duck	19401207		1JYVZYBIZ	MR00012.dcm	
Nasel Simon		192925	123456	MR00007.dcm	
NASEL SIMON	19401207	20120214	191352	852	MR00010.dcm

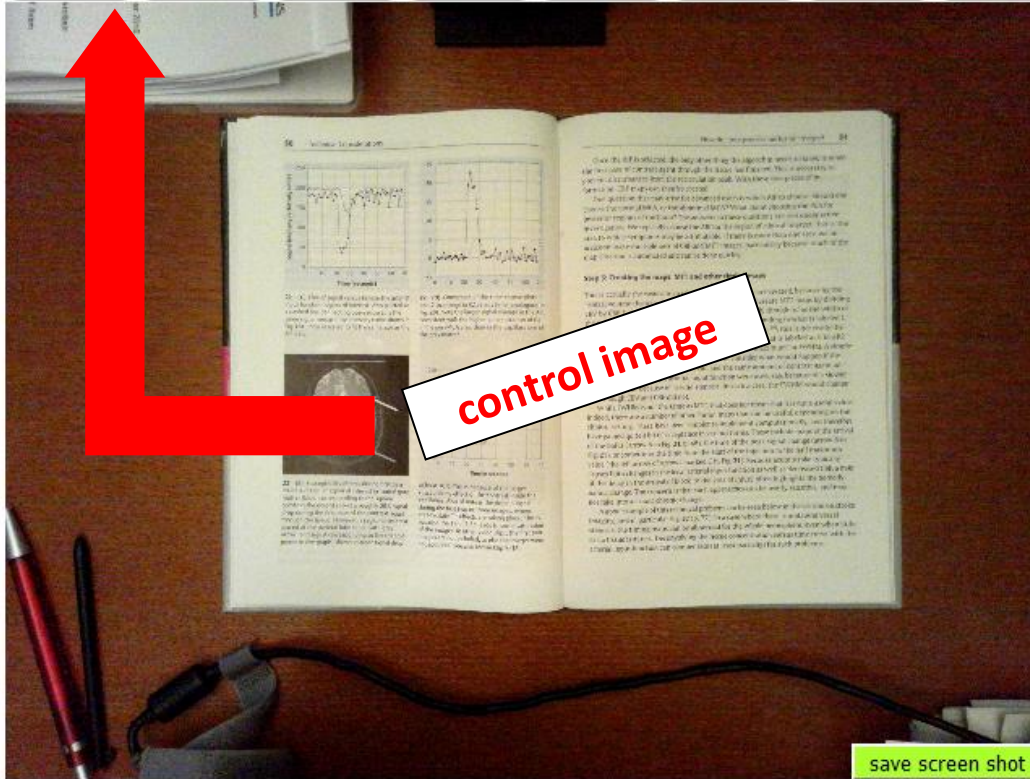
interactive table



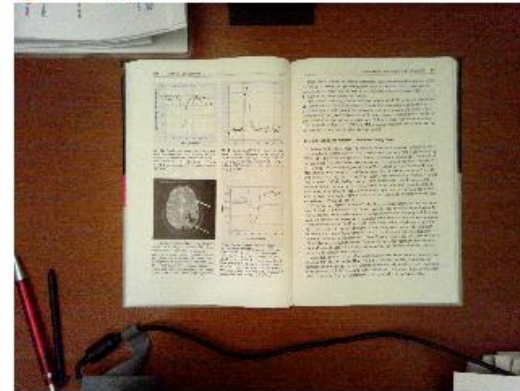
RISPAD: *client - GUI*

RisPad - Radiology information system - notePad

images to be linked to patient



● to copy click on the video below



Patient..... **Nasel Simon**

DoB..... **19970319**

ExmDat... **20140617**

ExmTime.. **192925**

ID..... **123456**

save screen shot

link to dicom

Show **5** entries

Showing 1 to 3 of 3 entries = Search:

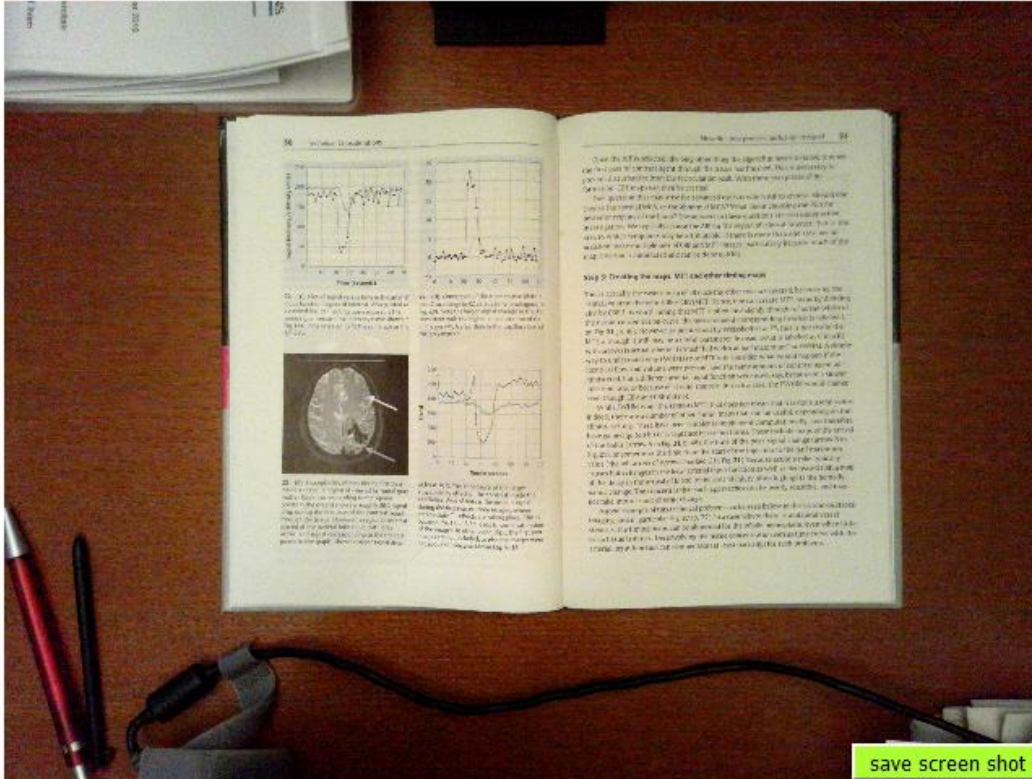
Previous Next

Donald Duck	19401207	20011016	123452	1JYVZYBIZ	MR00012.dcm
Nasel Simon	19970319	20140617	192925	123456	MR00007.dcm
NASEL SIMON	19970319	20120214	191352	852	MR00010.dcm

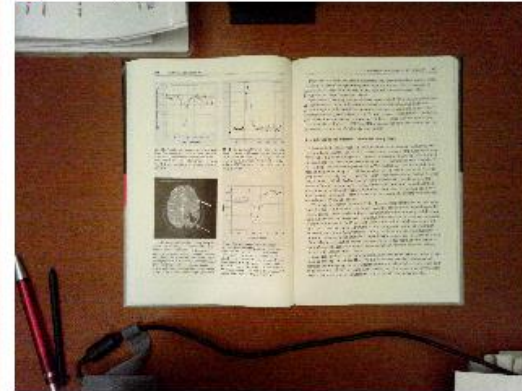
RISPAD: *client - GUI*

RisPad - Radiology information system - notePad

images to be linked to patient ↗



● to copy click on the video below



Patient..... **Nasel Simon**
 DoB..... **19970319**
 ExmDat... **20120214**
 ExmTime.....
 ID..... **123456**

dicom control



link to dicom

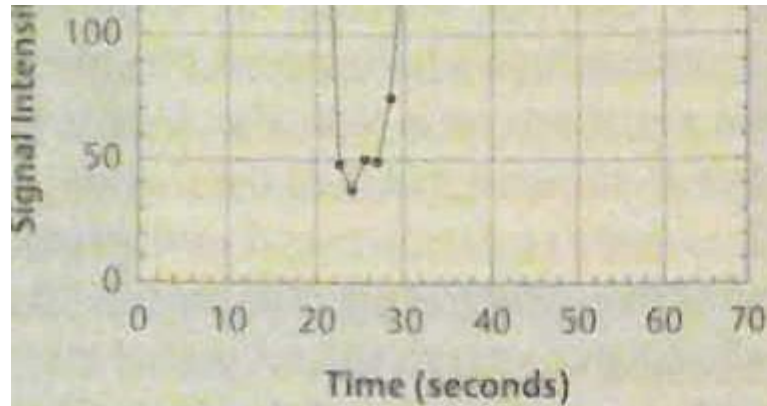
Show **5** entries Search:

Showing 1 to 3 of 3 entries refresh dicom entries = .dcm Previous **1** Next

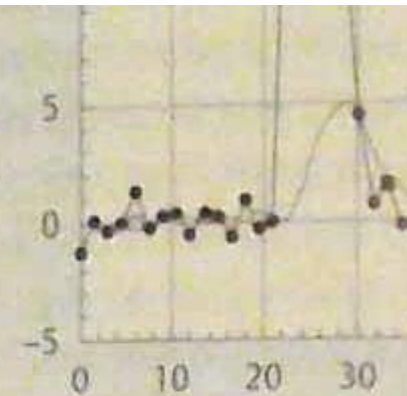
Donal Duck	19401207	20011016	123452	1JYVZYBIZ	MR00012.dcm
Nasel Simon	19970319	20140617	192925	123456	MR00007.dcm
NASEL SIMON	19970319	20120214	191352	852	MR00010.dcm

save screen shot

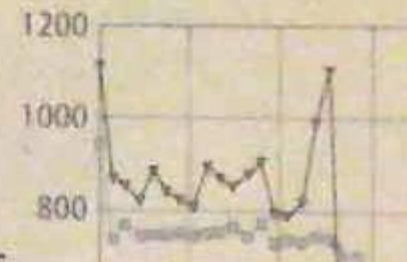
final image quality:
readable copy of
document



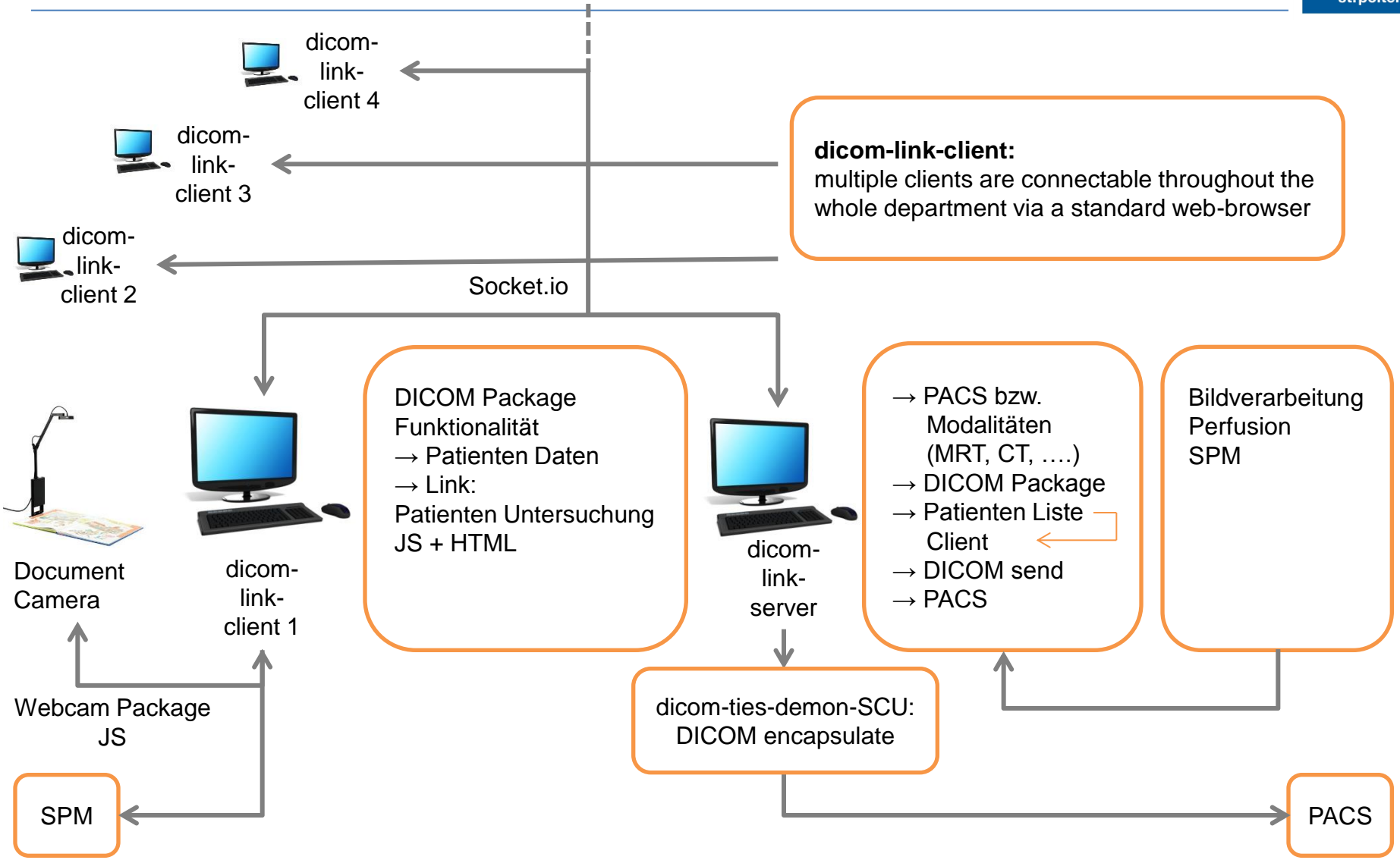
22 (C) Plot of signal versus time in the arterial input function region of interest. Also plotted as a dashed line connecting open squares is the same signal versus time intensity curve shown in Fig. 19C, now rescaled to fit the same axis as the MIF data.



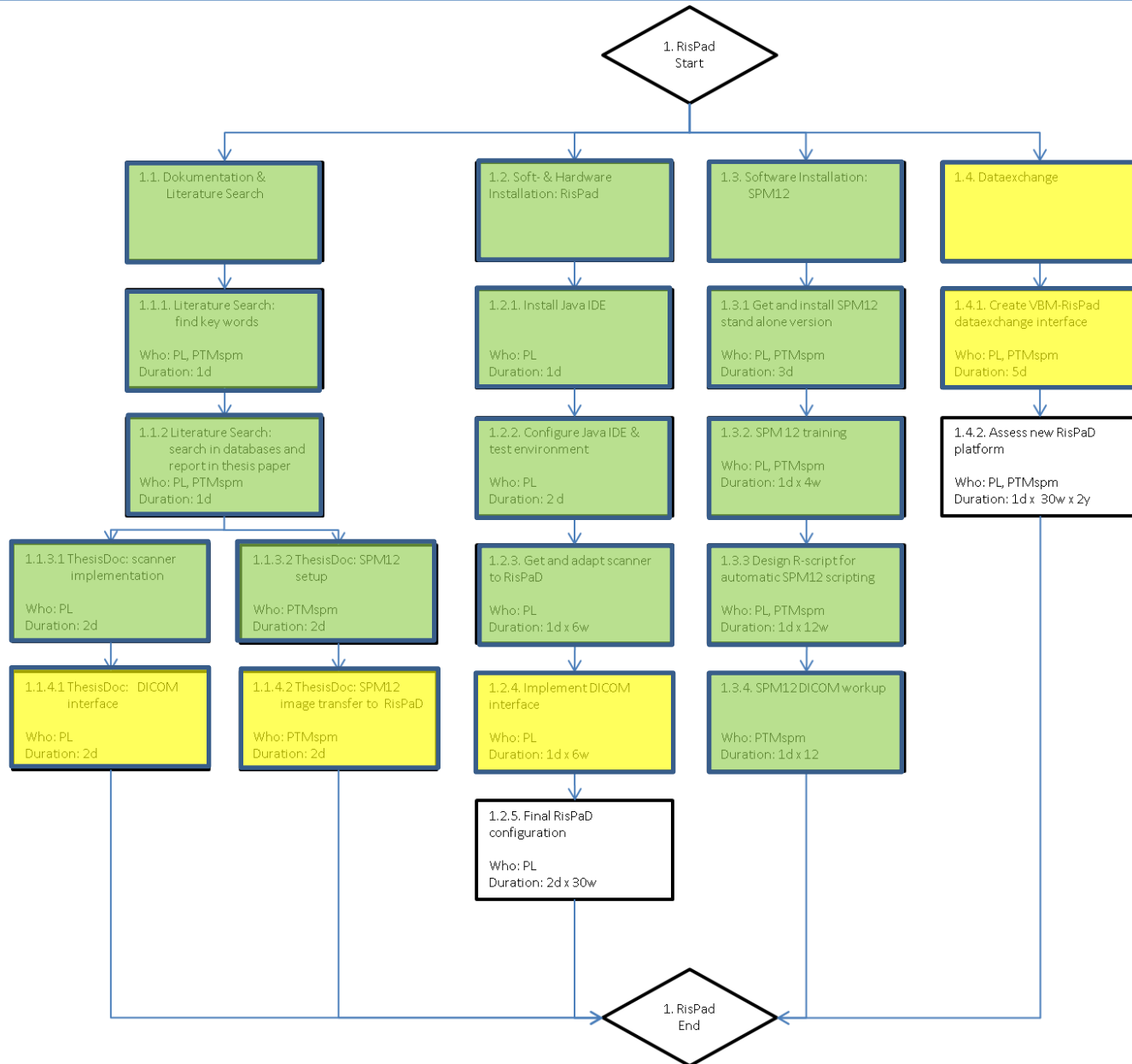
22 (D) Conversion of the part C to change in R_2 versus time (see Fig. 20). Note the larger signal change in the peri-MCA area than in the gray matter.



RISPAD: network structure



VBM – RISPAD: Project Plan



The RISPAD – Project

Demonstrating the Implementation of a **RIS-PACS** compatible
handout **D**ocumentation system.

Thank You for Your Attention

Ganster Barbara and Nasel Christian

Master Course Digital Healthcare (supervisor: Ritschel H.)