

Visualisiertes Wissensnetz für medizinische Applikationen

Waltraud Winter Siemens Healthcare CR

Karsten Schrempp Pantopix

Agenda



- A few words about CT
- Why did we start this project?
- New scanning software requires new approach
- Methodical approach
- Semantic net
- Outlook

Agenda



- **What we are and what we do**
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- Outlook

Who we are and what we do

Waltraud Winter



Computed Tomography and Radiation Oncology

Siemens AG Healthcare, Imaging & Therapy

Head of Siemens H IM CR R&D SW PTD

(Software processes & tooling, release management and calibration & documentation)

Karsten Schrempp



Consultant for information management

PANTOPIX

- Data modeling and process development for information management
- System integration
- Project management and coaching

Agenda

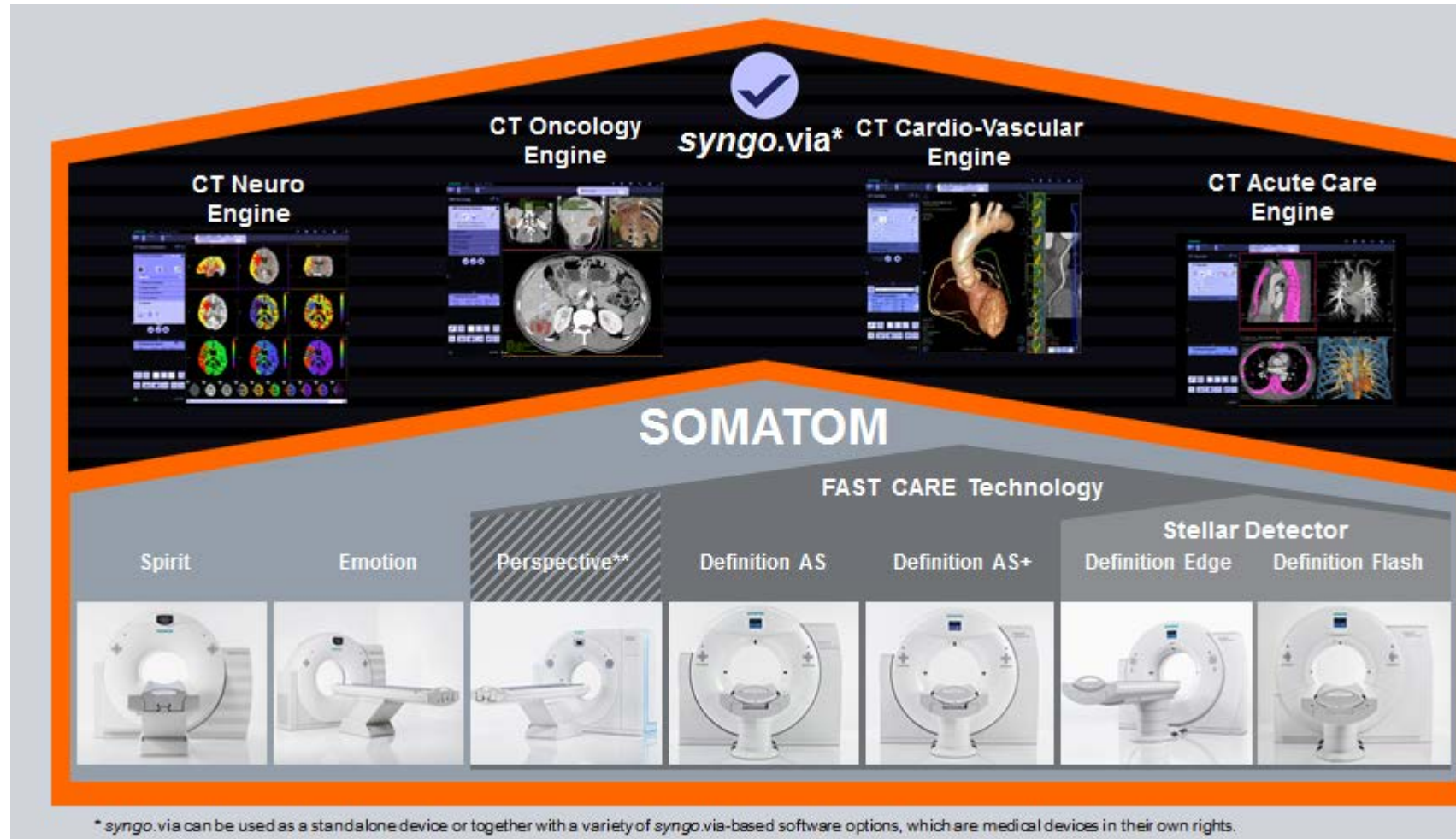


- What we are and what we do
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Computed Tomography

Product Portfolio

SIEMENS



Some examples



Agenda



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Do you remember clicking the HELP button?

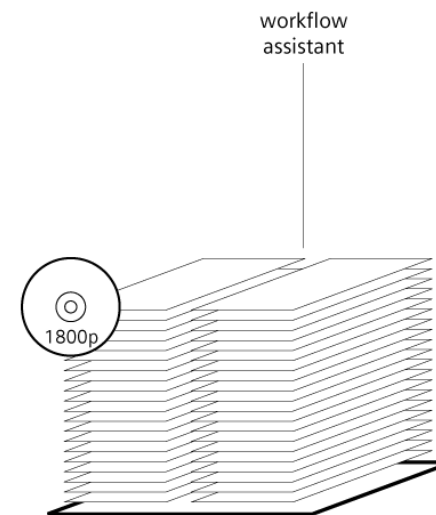
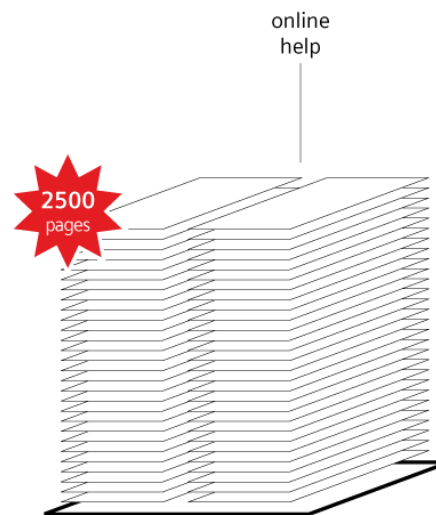
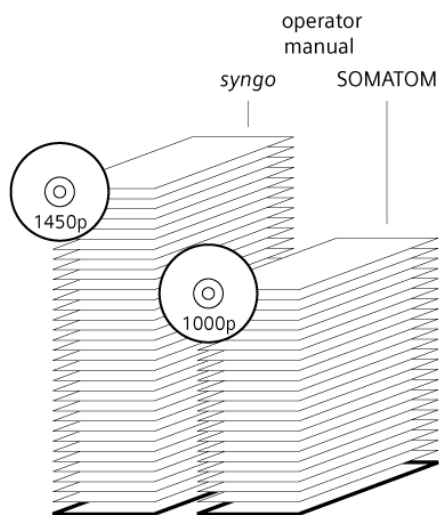


Only when nothing else works...

Why does the Healthcare documentation not reach our customers?

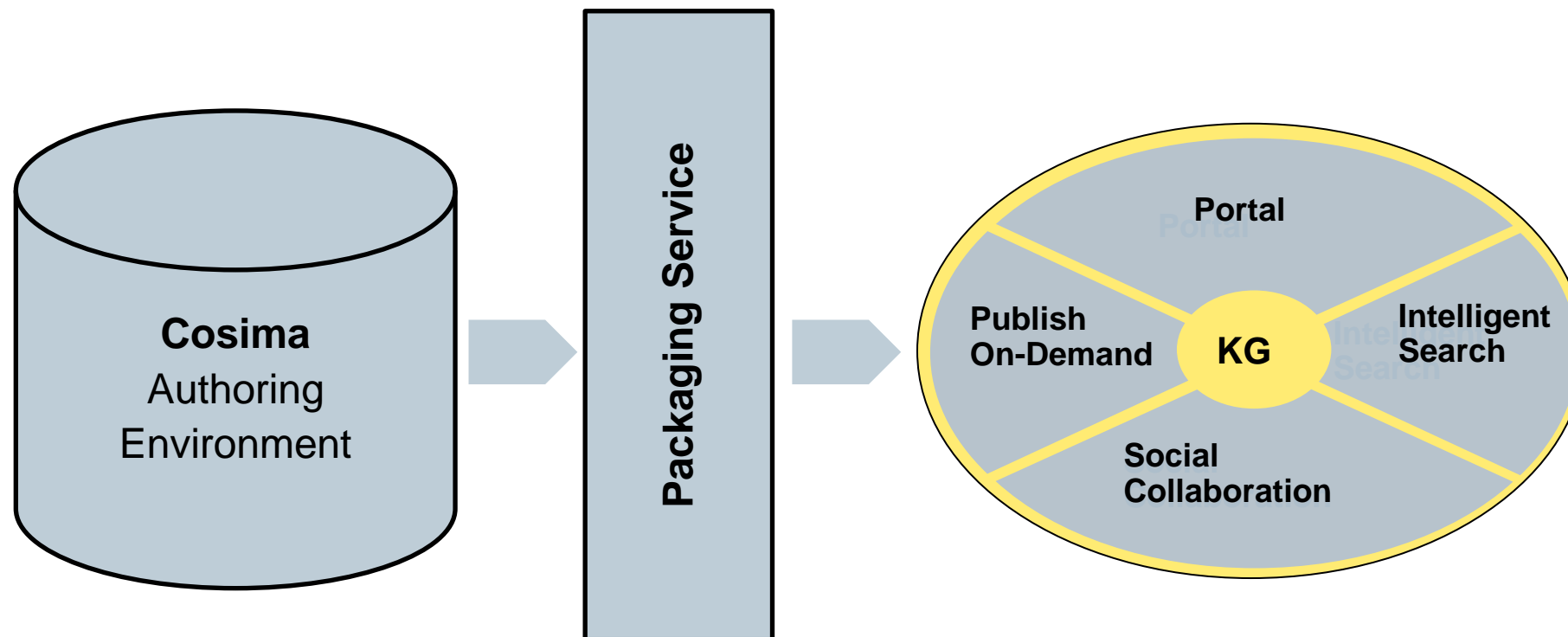


...too much, unsorted, unspecific information.



New information environment for our customers

From documentation to communication



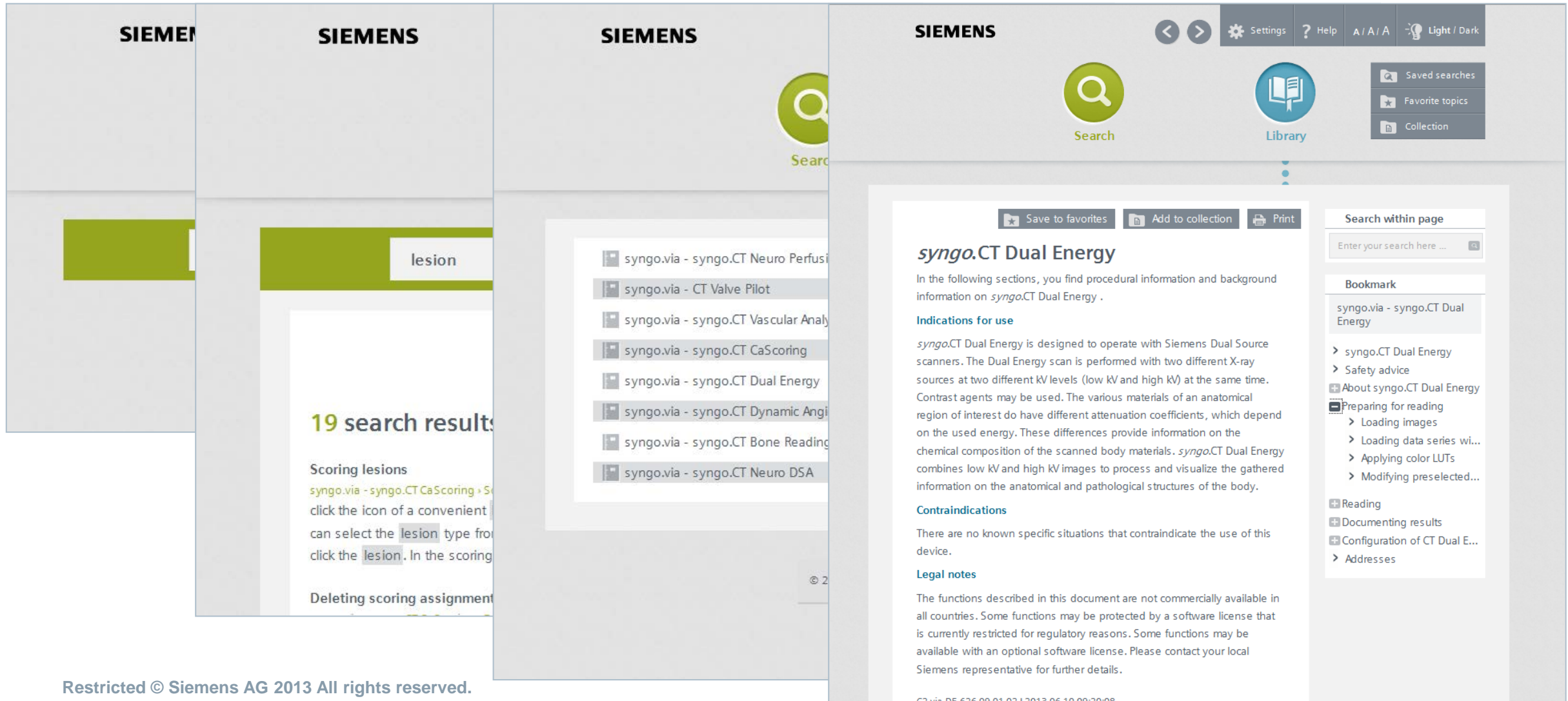
Functional modules

- **Web portal** that provides users with a flexible interface to achieve their goals
- **Search engine** for easy retrieval of needed information in the right granularity
- **Collaboration platform** to connect customers and facilitate collaborative working
- **Publishing** module to provide information in multiple formats for various devices

Knowledge Gateway Version 1

User Interface

SIEMENS





Search



Library



Saved searches



Favorite topics



Collection

centerline



Save search

1 | 2 | 3 | 4 | 5 ▶

47 search results:

Displaying centerlines

[syngo.via](#) - [syngo.CT Vascular Analysis](#) > [Displaying centerlines](#)

activated **centerline** is shown in suitable segments. You can switch on or off the **centerline** representation. From the upper left corner menu, choose Show **Centerline**. The currently activated **centerline** is shown ...

Adding controlpoints

[syngo.via](#) - [syngo.CT Vascular Analysis](#) > [Adding controlpoints](#)

you need to modify sections of **centerline** without changing other parts of the same **centerline**. You can add several controlpoints to each **centerline**. Select the **centerline** that you would like to edit. In ...

Filter results

- ☒ Anatomy (19)
- ☒ Information classes (38)
 - ☒ Clinical (32)
 - ☐ Safety (1)
 - ☒ System (5)
 - ☒ Product descrip...
- ☒ Software component...
 - ☒ CT (19)
 - ☐ Cardiac Functio...
 - ☐ Vascular Analysi...

Language

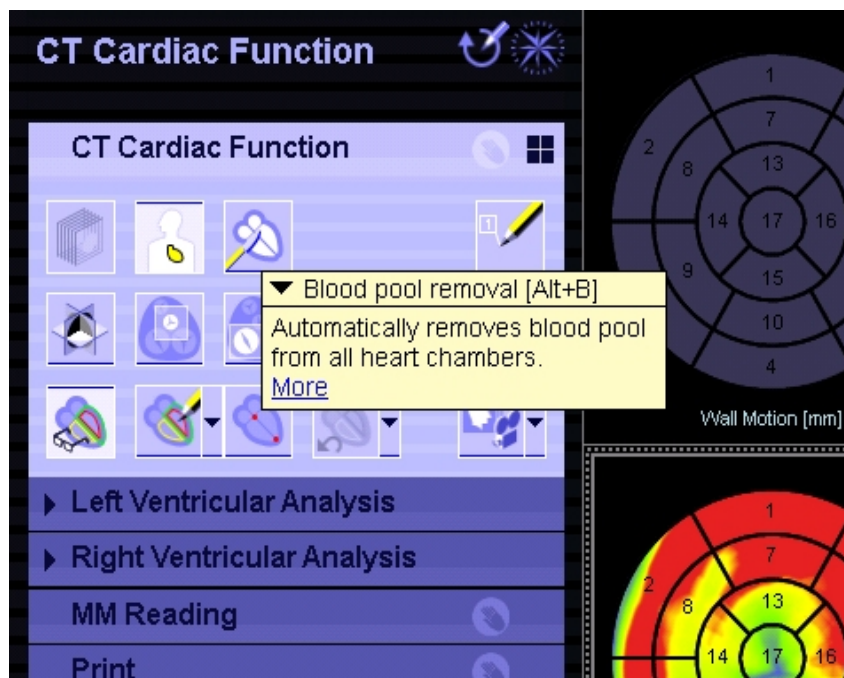
☒ English

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Context-sensitive help 1:1



1 : 1

Head Bone Removal parameters

With the Head Bone Removal application subclass, you can automatically remove bone or dense plastic from CT angiography (CTA) data sets. This application subclass is particularly designed for the visualization of head angiographies, including carotid scans.

The basis for Head Bone Removal is the decomposition of the material into its component parts: blood, contrast agent, and bone.

Visualization tab

For this application subclass, the tab does not contain any parameters.

Presets tab

From the VRT Preset Selection list, you can select a VRT which controls the initial color display in a VRT image.

New scanning approach requires a new information retrieval

The screenshot displays the Siemens vegafedt software interface for configuring a Body Angio protocol. The left sidebar contains a list of protocol steps: Protocol Body Angio, Topogram, PreMonitoring, Monitoring, Pre Condition (checked), Body Angio (selected), Quality Check Body Angio, Venous Phase, Reconstruction, and Finalize. The Body Angio step is expanded, showing parameters: CTDIvol(32cm) 14.19 mGy, DLP 167.5 mGy*cm, kV 120, mAs 210, and Scan Time 5 s. The main display area shows a topogram and a cross-sectional CT scan of the abdomen. The right sidebar, titled 'Recon Ranges', shows thumbnails for Topogram, PreMonitoring, Monitoring, Body Angio, and Venous Phase. The bottom of the interface features a timeline with various time intervals: 3 s, 2 s, 6 ml/s, 5 ml/s, 8 s, 5 s, and 43 s. A green vertical bar highlights the 'Body Angio' step in the left sidebar.

7 parameters: Find the best matching information for the user!

New scanning approach requires a new information retrieval

SIEMENS vegafedt

BA Pat Protocol F
Body Angio Protocol
9/30/1960 02

Protocol Body Angio

Topogram ☐

PreMonitoring ☐

Monitoring ☐

Pre Condition ☒

Body Angio

CTDIvol(32cm) 14.19 mGy

DLP 167.5 mGy*cm

kV 120

mAs 210

Scan Time 5 s

Quality Check Body Angio ☐

Venous Phase ☐

Reconstruction

Finalize

Recon Ranges

Topogram

PreMonitoring

Monitoring

Body Angio

Venous Phase

Body Angio

Confirm Go Stop

1 → 1 is not an option!

How to retrieve the best fit?

Semantics, ontologies?

Other options?

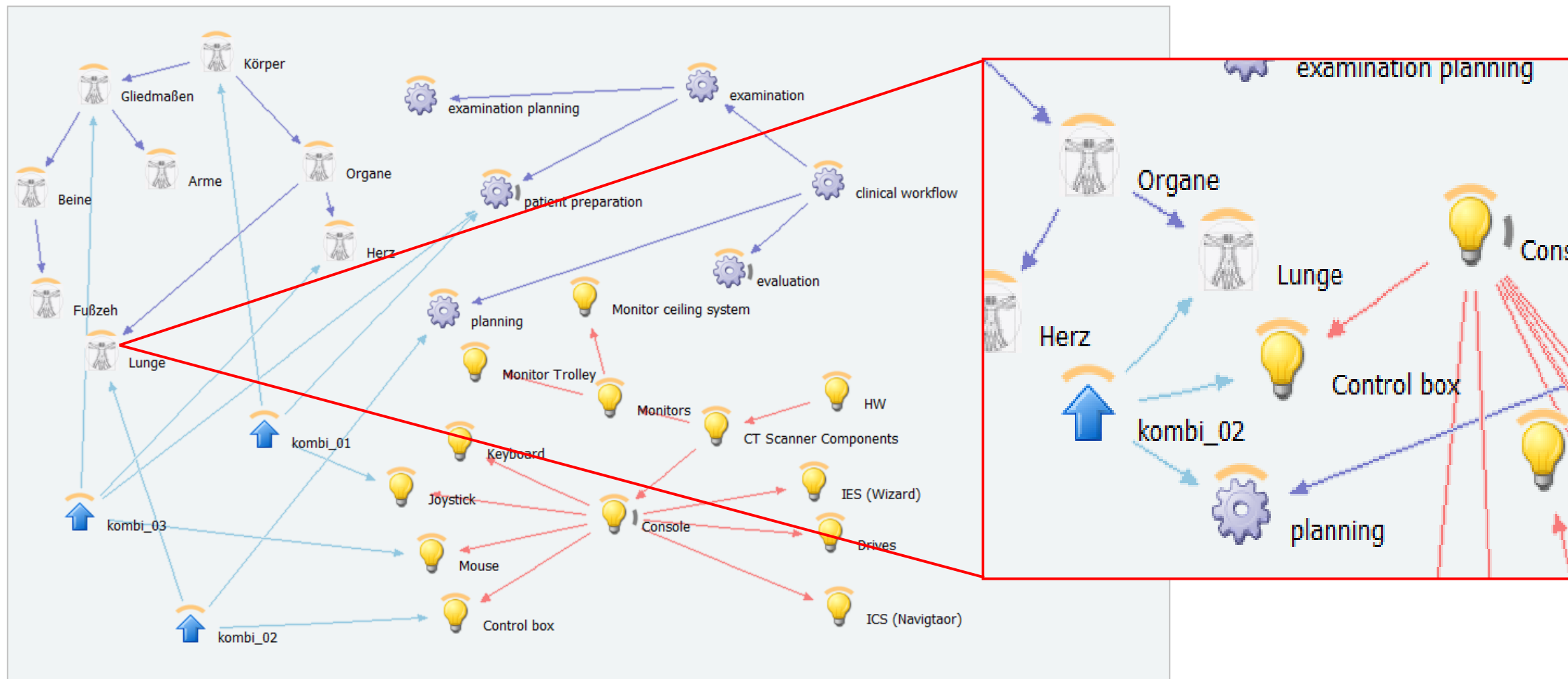
7:02 PM inter/Karsten Schrepp

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Semantic nets?



Topic oriented approach

★ Save to favorites 📁 Add to collection 🖨️ Print

Gantry (scan unit)

The interior of the gantry consists of a rotating X-ray detector system. This X-ray detector system consists of the X-ray tubes, the collimators, and the UFC detectors (Ultra Fast Ceramic detectors). (→ [Scan Unit \(Gantry\)](#))

Furthermore, the gantry contains the following components:

- Generators
- Motor drive
- Data acquisition system
- Unit control
- Laser light markers for vertical and horizontal positioning
- Cooling system
- Microphone and loudspeaker for the intercom system
- Mood Lighting for lighting the gantry ring and gantry funnel (optional)

C2-058.620.01.01.02 | 2013-08-13 17:42:40

What is a...?
What is the function of...??

How to ...?

★ Save to favorites 📁 Add to collection 🖨️ Print

Starting measurement

1. Position the table such that the water phantom is in the scan plane.

OK

2. Click on the OK button.

The "Quality Assurance Patient" is automatically selected. Table movement starts automatically.

C2-058.620.01.01.02 | 2013-08-13 17:42:40

Documents are an hierarchical collection of topics

Save to favorites Add to collection Print

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C2-058.620.01.01.02 | 2013-08-13 17:42:40

Save to favorites Add to collection Print

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C2-058.620.01.01.02 | 2013-08-13 17:42:40

- + Introduction
- + Safety
- System Description
 - System Overview
 - Components of the...
 - > Gantry (scan u...
 - > Gantry operator...
 - > Patient table
 - > Console with in...
 - > Image reconstr...
 - > Power distributi...
 - > Wall switch
 - > Heat exchanger
 - > Accessories
- + User guidance con...
 - > Expansion levels of...
- + Scan Unit (Gantry)
- + Patient Table
- + Console Related Safet...
- + syngo Acquisition Wor...

Topic type: description

Save to favorites Add to collection Print

Gantry (scan unit)

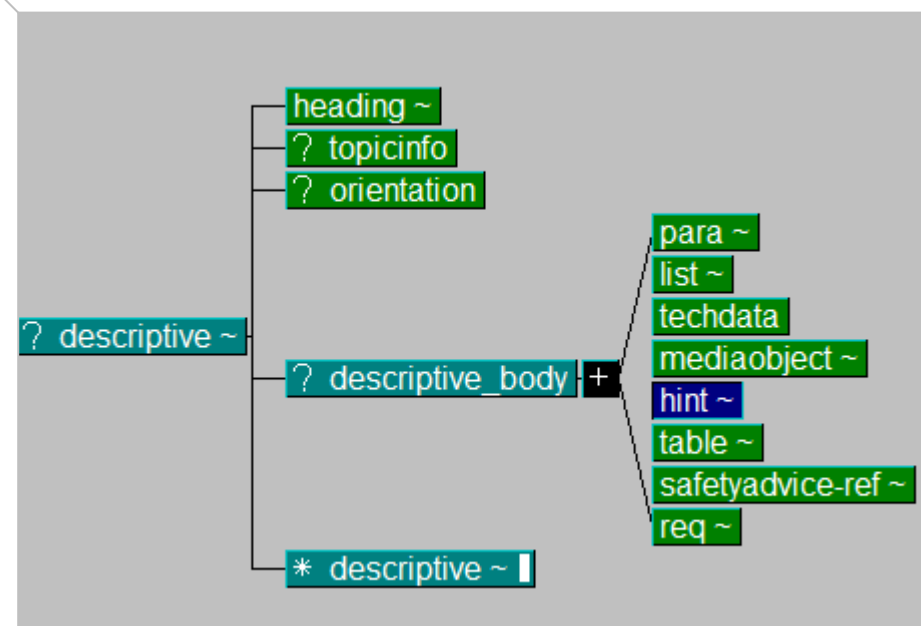
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C2-058.620.01.01.02 | 2013-08-13 17:42:40

What is a...?
What is the function of...??



Topics with descriptive content

[Save to favorites](#) [Add to collection](#) [Print](#)

Anlagenübersicht

In diesem Teil erhalten Sie einen Überblick über die Komponenten Ihres Computertomographen und dessen optionale Bestandteile.

i Manche Komponenten oder Software-Funktionalitäten sind möglicherweise nicht in Ihrer Systemkonfiguration inbegriffen, werden aber trotzdem in den vorliegenden Gebrauchsanweisungen beschrieben. Es kann sein, dass nicht alle davon ausdrücklich als optional gekennzeichnet sind. Die Verfügbarkeit dieser Komponenten oder Software-Funktionalitäten hängt von Ihrem Kaufvertrag ab.



The image shows a 3D rendering of a Siemens CT scanner system. It includes a large gantry (2) with a patient table (6) extending from it. To the left is a control console (1) with a chair. To the right are several cabinets: a tall one (3), a shorter one (4), and a small one (5). A large floor-standing unit (7) is also visible. Numbered callouts 1 through 7 point to these specific components.

[Save to favorites](#) [Add to collection](#) [Print](#)

Wartungsintervalle

! VORSICHT

Fehlende Wartungsarbeiten an der Anlage!

Scanabbruch oder verminderte Bildqualität aufgrund von Fehlfunktionen.

- ♦ Sorgen Sie dafür, dass die vorgeschriebenen Wartungsintervalle eingehalten werden.
- ♦ Kontrollieren Sie die Bildgebung mit dem monatlichen Konstanztest.

1. Weitere Hinweise zur Wartung und zu den Wartungsintervallen entnehmen Sie bitte: *Betreiberhandbuch*

C2-058.620.01.01.01 | 2013-08-26 09:37:24

Topic type: task

Save to favorites Add to collection Print

Laser-Lichtvisier verwenden

Der Patient darf nicht in das Laser-Lichtvisier blicken. Falls es erforderlich ist, muss der Benutzer sicherstellen, dass die Augen des Patienten geschützt sind (z. B. bei nicht ansprechbaren Patienten oder bei fehlendem Lidschlussreflex).



Der Patient darf keine Sehhilfen tragen.

1. Weisen Sie den Patienten an, nicht direkt in den Laserstrahl zu blicken.



2. Schalten Sie das Lichtvisier ein.

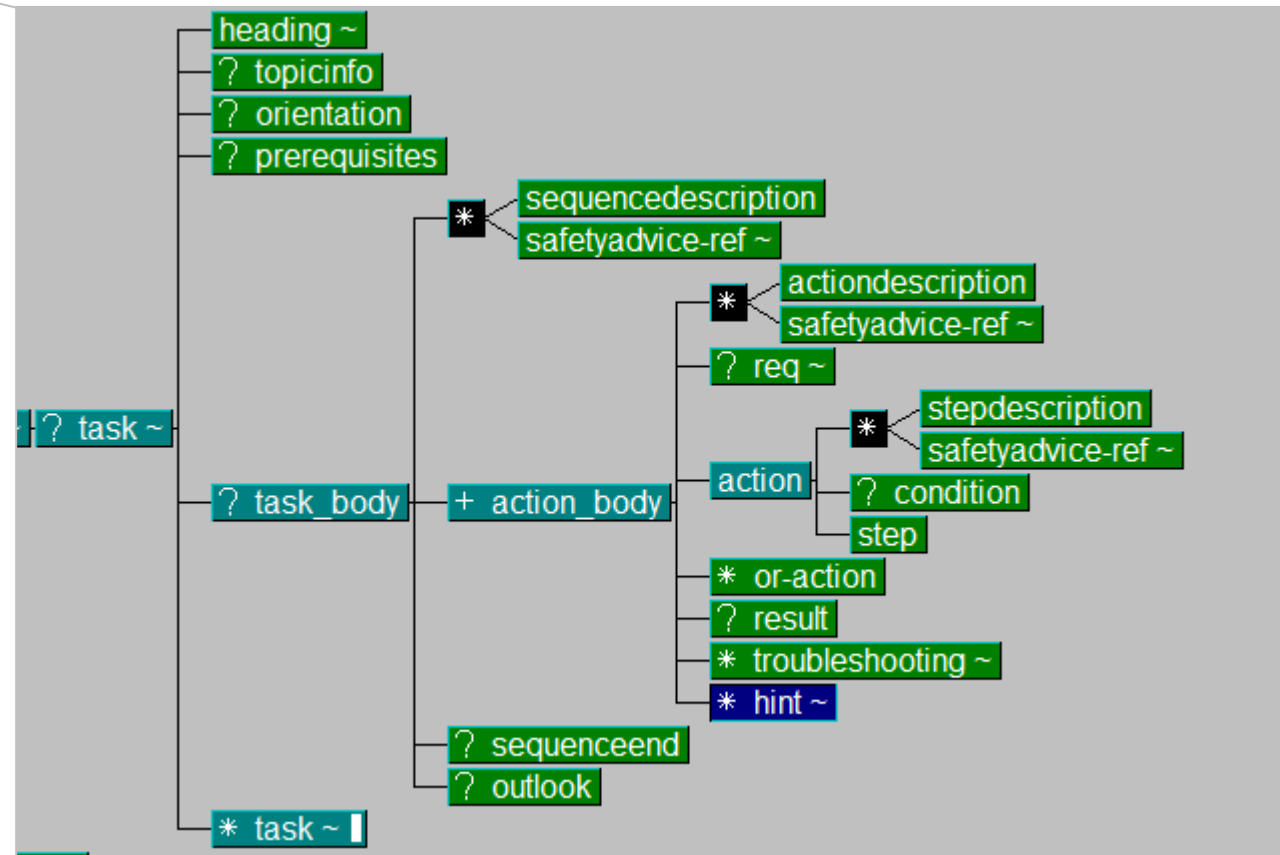


3. Passen Sie die Längsposition des Tisches an. Verwenden Sie hierfür die Tasten für die horizontale Tischbewegung.

Der Startpunkt für die Messung wird nun vom Offset-Lichtvisier markiert.



4. Passen Sie die Höhe des Patiententisches an. Verwenden Sie hierfür die Tasten für die vertikale Tischbewegung.



Instructional content

Inserting a USB device

CAUTION

Using USB devices without own power supply!

The USB controller can be permanently damaged.

- ◆ Use USB devices as recommended in the operator manual.

CAUTION

Use of non-integrated USB storage device!

Reboot request of the operating system.

- ◆ Ignore the reboot request and press Cancel.
- ◆ Finish your examination or application.
- ◆ Restart the system with **System > End > Restart System** .

1. Insert the USB device into the USB port at the front of the computer
(→ *USB devices*).

The operating system recognizes the USB device.

Removing a USB device

- ✓ Reading or writing from or to the USB device has been completed.

XML-based authoring

descriptive

Embedded descriptive

heading

Gantry operator panels

heading

descriptive_body

para

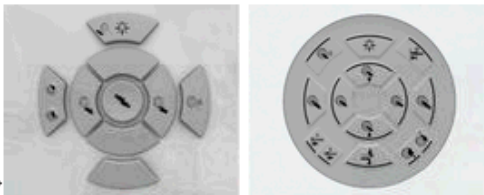
Your SOMATOM CT system has one of the following gantry operator panels.

para

mediaobject

Width: textsize

image/



image/

mediaobject

list

listintro

Due to the separation of the gantry and the patient table, the table movement keys on the gantry control panel work differently.

listintro

item

para

The keys for vertical table movement are nonfunctional.

para

item

item

para

The keys for horizontal table movement are used to move the gantry along the patient table.

para

item

item

para

The patient table retraction key is nonfunctional.

para

item

list

descriptive_body

descriptive

Embedded descriptive

heading

Laser light marker and examination range

heading

descriptive_body

mediaobject

Width: textsize

descriptive / descriptive / descriptive_body

XML-based CMS (Content Management System)

COSIMA enterprise

File Edit CMS Folder Object XML References Language Variants Translation Reports Window Help

CMS Navigator

- 26_MobileKit_DefinitionAS
- 29_MonitorCeilingSystem
- 30_UsageForVeterinaryPurposes
- 31_Mattress_with_spill_protection
- 32_SlidingGantry
 - Graphics
 - Modules
 - DATA_SlidingGantry_PatientTableReq, 1, en_US
 - DATA_SlidingGantry_Specifications, 1, en_US
 - DATA_SlidingGantry_TableHeightsAS+Ed
 - DATA_SlidingGantry_TableHeightsASOpen
 - DATA_SlidingGantry_TableTopReq, 1, en_US
 - DATA_SlidingGantry_TechSpec, 1, en_US
 - DESCR_SlidingGantry_Components, 1, en_US**
 - DESCR_SlidingGantry_CTMRestriction
 - DESCR_SlidingGantry_Description, 1, en_US
 - DESCR_SlidingGantry_Purpose, 1, en_US
 - DESCR_SlidingGantry_SystemOverview, 1, en_US
 - DESCR_SlidingGantry_UseOneTable, 1, en_US

Preview

DESCR_GantryOFF_Overview, 1, en_US [read only] DATA_SlidingGantry_Specifications, 1, en_US [read only] DESCR_SlidingGantry_Components, 1, en_US

the patient table is displayed as a positive value. A gantry movement away from the patient table is displayed as a negative value. `</para>` `</h1>`

`<para>` The relative gantry position is also displayed on the `<screenText>` **Routine** `</screenText>` parameter card of your `<nt>` *syngo* `</italic>` `</nt>` Acquisition Workplace. Depending on the current status of the CT system, the displayed patient table height can take not every continuous value, but only certain predefined values. `</para>`

`<descriptive body>` `</descriptive body>`

`<descriptive body>`

Embedded descriptive

`<heading>` **Gantry operator panels** `</heading>`

`<descriptive body>` `<para>` Your SOMATOM CT system has one of the following gantry operator panels. `</para>`

`<mediaobject>` Width: textsize

`<descriptive / descriptive / descriptive body>`

CMS Search Object Usage Authors Memory

Search hits: 125 | Displayed hits: 1-25

Name	Version	Language	Variant	Status	IO type	Revision - Last change
DATA_SlidingGantry_TableHeightsASOpen	1	English	United States	Draft	Module (descriptive)	Nov 6, 2013 10:56:41 AM
DATA_SlidingGantry_TableTopReq	1	English	United States	Draft	Module (descriptive)	Nov 6, 2013 10:59:19 AM
DATA_SlidingGantry_TechSpec	1	English	United States	Draft	Module (descriptive)	Mar 12, 2013 8:38:10 PM
DESCR_GantryOFF_Overview	1	English	United States	Draft	Module (descriptive)	Oct 8, 2013 1:39:40 PM
DESCR_GantryOFF_RemoteSignal	1	English	United States	Draft	Module (descriptive)	Oct 8, 2013 1:57:33 PM
DESCR_GantryOFF_Switch	1	English	United States	Draft	Module (descriptive)	Oct 8, 2013 1:54:28 PM
DESCR_GantryOperatorPanels_Description	1	English	United States	Draft	Module (descriptive)	Apr 22, 2013 5:54:32 PM
DESCR_SlidingGantry_Components	1	English	United St...	Draft	Module (descri...	Aug 14, 2013 4:56:1...
DESCR_SlidingGantry_CTMRestrictions	1	English	United States	Draft	Module (descriptive)	Mar 11, 2013 5:25:51 PM
DESCR_SlidingGantry_Description	1	English	United States	Draft	Module (descriptive)	Mar 11, 2013 4:22:35 PM
DESCR_SlidingGantry_Purpose	1	English	United States	Draft	Module (descriptive)	Mar 11, 2013 4:23:36 PM
DESCR_SlidingGantry_SystemOverview	1	English	United States	Draft	Module (descriptive)	Aug 14, 2013 4:57:11 PM
DESCR_SlidingGantry_UseOneTable	1	English	United States	Draft	Module (descriptive)	Aug 14, 2013 4:57:59 PM
DESCR_SlidingGantry_UseTwoTables	1	English	United States	Draft	Module (descriptive)	Aug 14, 2013 4:58:48 PM
DocVar_Comp_Gantry	1	English	United States	For approval for release	Module (descriptive)	May 8, 2013 11:08:12 AM
Gantry lighting colors	1	English	United States	Draft	Module (descriptive)	Apr 24, 2013 9:41:54 AM

Properties Metadata

Property	Value
IO	
Department	n/a
Identifier	ba1a1dfd5a1812a2c0a81...
IO type	Module (descriptive)
Name	DESCR_SlidingGantry_Co...
Project	n/a
IO language va	
Language	English
Last change	Mar 11, 2013 4:35:59 PM
Last change Klein, Eva	
Last status	Mar 11, 2013 5:08:45 PM
Variant	United States
IO version	

Auffindbarkeit

The screenshot displays a search interface with a green header bar. A search bar at the top contains the text 'gantry' and a magnifying glass icon. Below the search bar, a 'Save search' button is visible. A pagination bar shows page numbers 1 through 13, with page 1 selected. The main content area displays '128 search results:' followed by three search results. Each result includes a title, a breadcrumb trail, and a brief description. A red rectangular box highlights a 'Filter results' sidebar on the right. This sidebar contains expandable categories: 'Hardware component...' (with 'CT (71)' as a sub-item), 'Information classes (1...)' (with 'Clinical (17)', 'Safety (8)', and 'System (79)' as sub-items), and 'Software component...' (with 'CT (7)' as a sub-item). The 'System (79)' category is currently expanded. At the bottom of the sidebar, there is a 'Language' section with radio buttons for 'English' and 'Deutsch', where 'Deutsch' is selected.

gantry

Save search

1 2 3 4 5 ... 13

128 search results:

Gantry-Bedienfelder
SOMATOM - SOMATOM Force > Gantry-Bedienfelder
Mit den Bedienfeldern steuern Sie die Gantryfunktionen, die Bewegung der Patientenliege und das Ausl ...

Scaneinheit (Gantry)
SOMATOM - SOMATOM Force > Scaneinheit (Gantry)
Gerätebewegungen und der Strahlung Gantry-Rückseite Auf der Rückseite der Gantry befinden sich die folgenden Bedienelemente: (1) Darstellung Beschreibung der Gantry-Anzeige Gantry-Anzeige Beschreibung des EK ...

Gantry (Scaneinheit)
SOMATOM - SOMATOM Force > Gantry (Scaneinheit)
Scaneinheit (Gantry) Außerdem enthält die Gantry die folgenden Komponenten: Generatoren Motorantrieb Datenakquisitionssystem Gerätesteuerung Laser-Lichtvisiere zur vertikalen und horizontalen Positionierung ...

Filter results

- ☐ Hardware component...
 - ☐ CT (71)
- ☐ Information classes (1...)
 - ☐ Clinical (17)
 - ☐ Safety (8)
 - ☒ System (79)
 - ☐ Maintenance (1)
 - ☐ Product descrip...
 - ☐ Quality Assura...
 - ☐ Startup/Shutdo...
- ☐ Software component...
 - ☐ CT (7)

Language

- ☐ English
- ☒ Deutsch

Metadata

Hardware
Family

Software
Family

Software
Version

★ Save to favorites

📁 Add to collection

🖨️ Print

Positioning the Patient

This section gives you information about positioning the patient.

We will start with important information about positioning. Then, you will learn how to position the patient correctly.

After that, the use of accessories for positioning in various examinations is discussed.



The CT images shown in this section are only examples.

System

It is assumed that you are already familiar with the system. (→ [System Overview](#)) (→)

Positioning aids

For information about the accessories available, see (→) (→) (→ [Positioning aids](#)).

Safety

The safety information contained in this manual must be observed, especially the following sections: (→ [General Safety Information](#)), (→ [Information about Personal Safety](#)), (→ [Accessory Related Safety Advice](#))

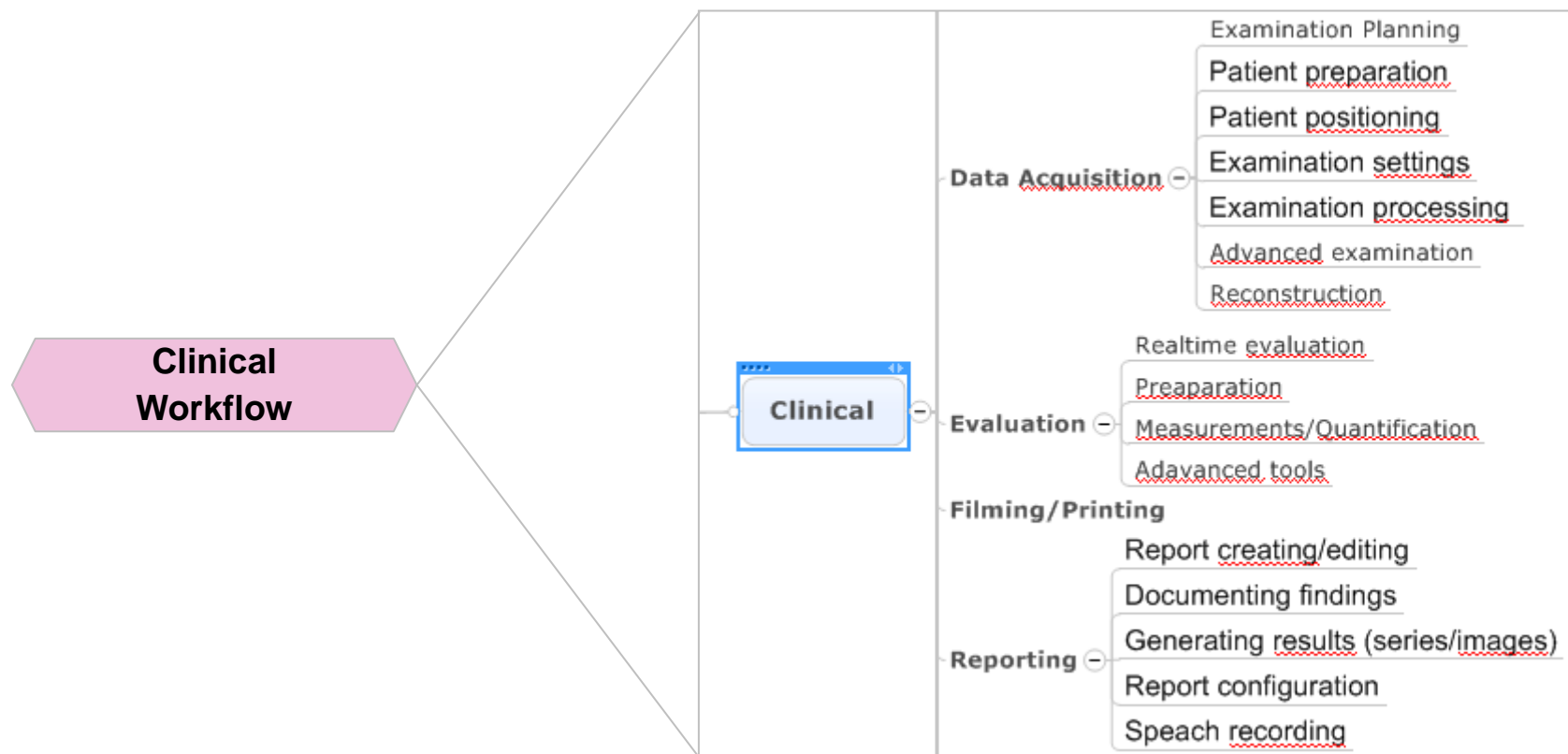
C2-058.620.01.01.02 | 2013-08-13 17:42:40

Clinical
Workflow

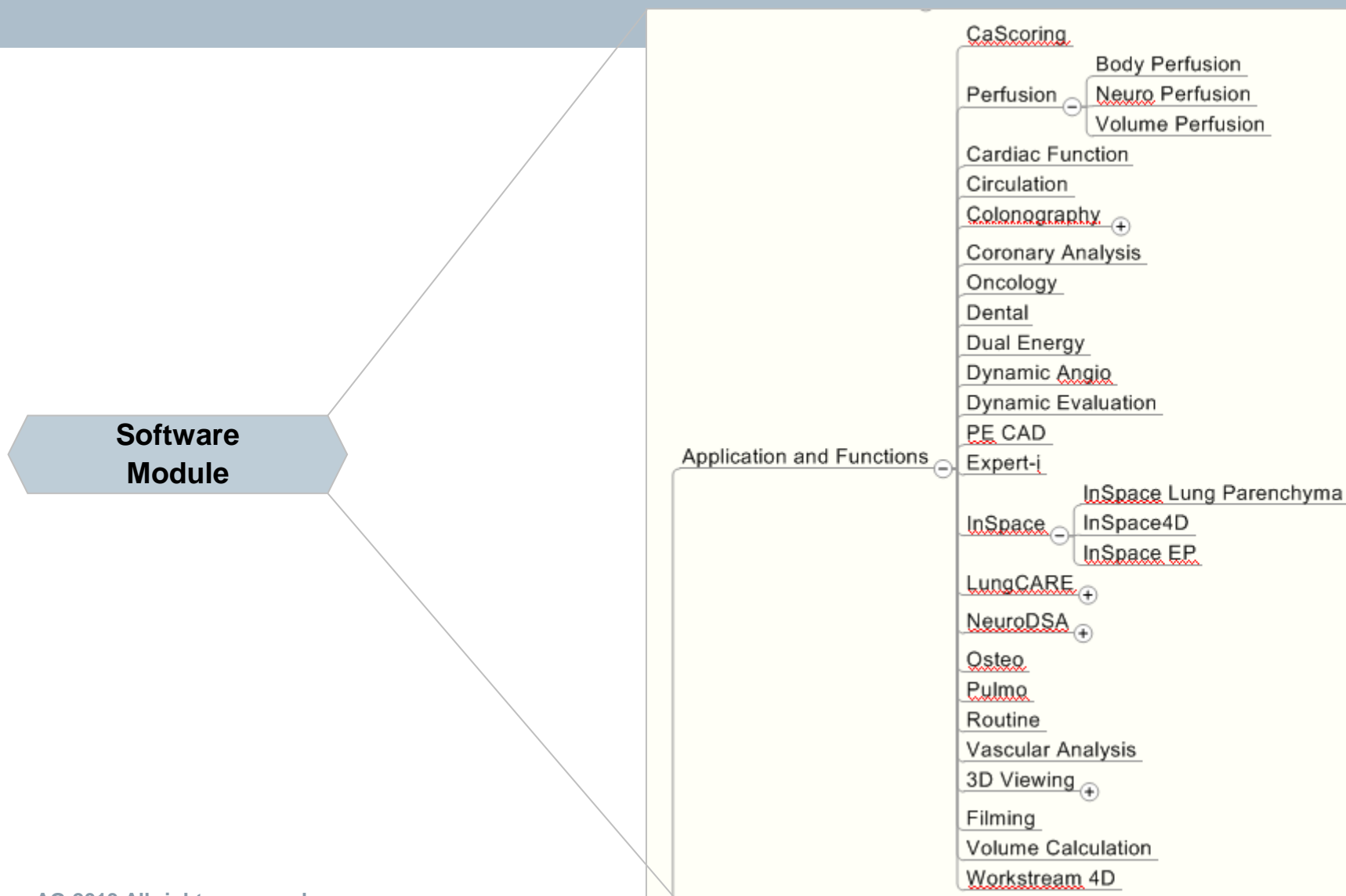
Hardware
Component

Software
Module



Metadata – Clinical Workflow



Metadaten – software modules



Metadata ext.

Hardware
FamilySoftware
FamilySoftware
Version Save to favorites Add to collection Print

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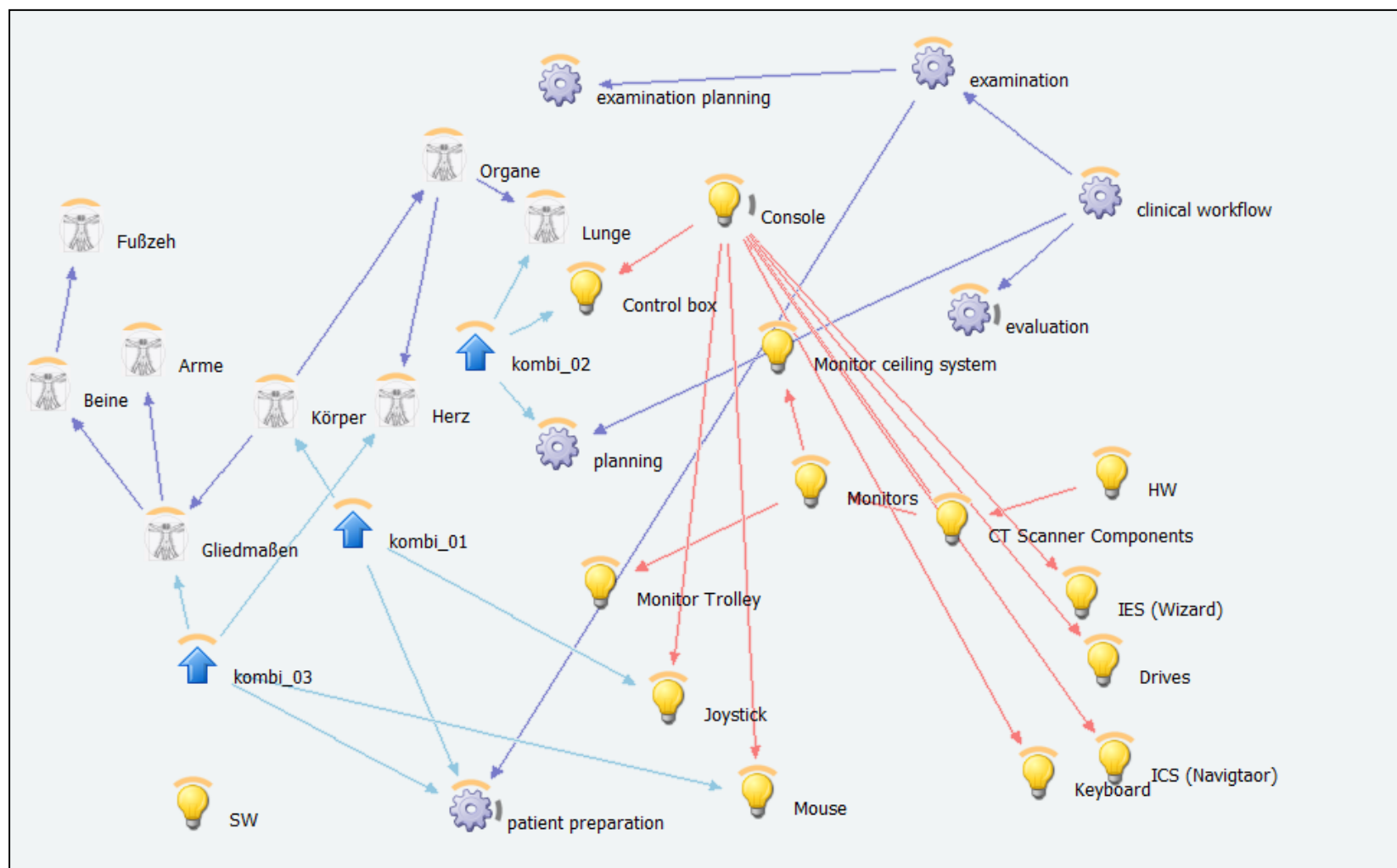
C2-058.620.01.01.02 | 2013-08-13 17:42:40

Clinical
Workflow

Anatomy

Hardware
ComponentSoftware
Module

Draft of an ontology



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- **Semantic net**
- Outlook

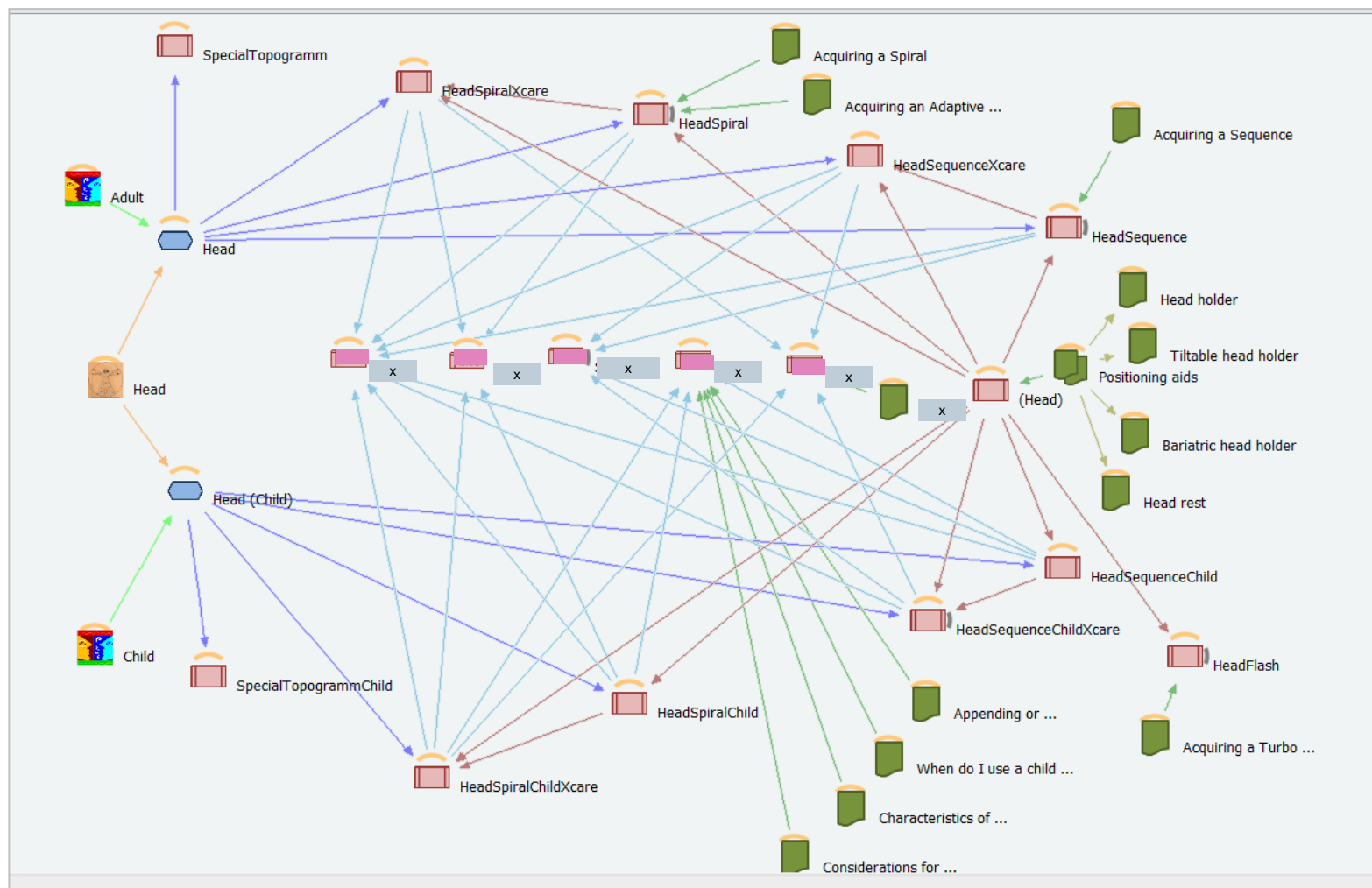
KGW 1.0: User acceptance test

- Google-like search leads to a very high acceptance!
- The users do not want an *Advanced Search*
 - Means: they do not want to parameterize a search
- The user expects information classified for his needs:
 - Background knowledge for *typical* processes
 - *Rarely* executed processes
 - But: we do not have any personalization
- Summary for the KGW:
 - The content has to be provided with an extended context of meaning
 - This context cannot be derived from the linear documents but from related subjects which are not linked as related topics.
 - The context has to be established in a flexible way as a qualified facet depending on the search result

Scan protocol parameter handover

Content Metadata										
	Weighting	0	1	1	1	1	1	1	1	
	Metadata Type	Infoclass	Anatomy	HW Comp	SW Mod	SW Version	HW Family	SW Family		
	Metadata Value									
Scan Protocol Parameter										
	Weighting		1	3	5	1	1	1		
	Metadata Type		Group	Mode	SubMode	SubSubMode	Clinical	Population	SubC	
	Metadata Value		Neck	Sequence						

Semantic net



Related content for scan protocols

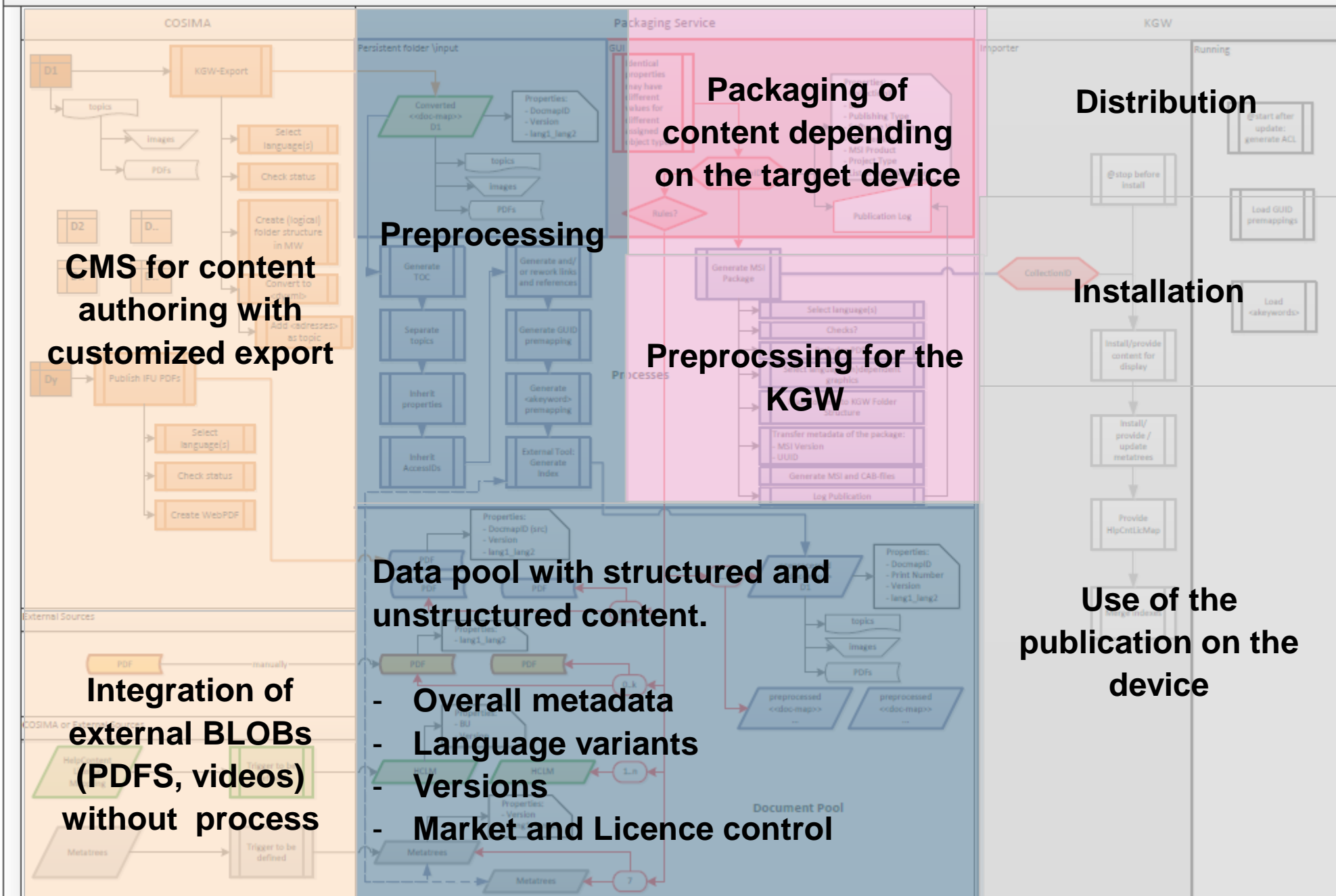
Scan Protocol Parameter									
	Weighting		1	3	5	1	1	1	
	Metadata Type		Group	Mode	SubMode	Clinical	Population	SubClinical	Feat
	Metadata Value		Neck	Sequence					



Metadata types and Values										
List of content objects with metadata										
Infoclass	Anatomy	Group	Mode	SubMode	SubSubMo	Content	Weighted Match	Depth of Information	Facets: (Relation, Weight)	
Product Description		SpecialECG	Sequence			ECG desc	3	4	(Infoclass;0)(Group;1)(Mode;3)	
		Neck				general	1	1	(Group;1)	
patient positioning		Neck				Neck	1	1	(Infoclass;0)(Group;1)	
Product Description			Sequence			Sequence desc	3	3	(Infoclass;0)(Mode;3)	
Product Description		Neck	Sequence	Uhr		NeckSequencUhr Desc	4	9	(Infoclass;0)(Group;1)(Mode;3)(SubMode;5)	
Product Description		Neck	Sequence			NeckSequence Desc	4	4	(Infoclass;0)(Group;1)(Mode;3)	

Overall process

Functional Architecture: KGW-Export -> Packaging Service -> MSI to KGW, version 1.1, released (Generation of CAB files added.)



Agenda

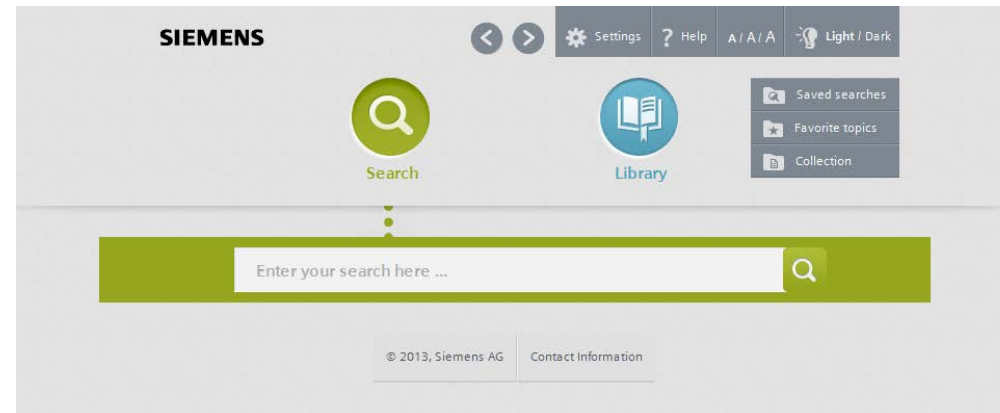


- What we are and what we do
- A few words about CT
- Why did we start this project?
- New scanning software requires new approach
- Methodical approach
- Semantic net
- **Outlook**

Knowledge Gateway

One solution for Siemens Healthcare

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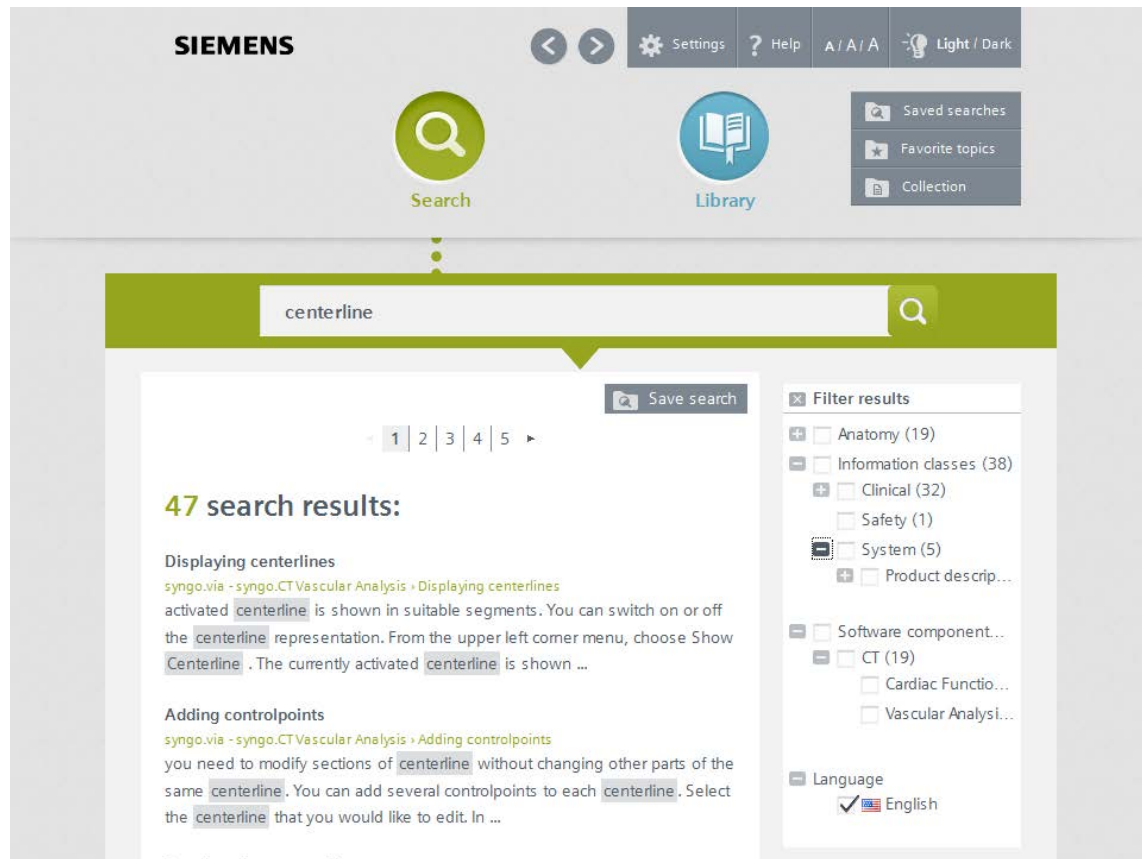
Somaris 7/VA50



ARTIS EAS



syngo.via VA30



Online Version

Chat, content sharing, communication features

Recipes

Learning from the customer by publishing their recipes

Speed Info

Quick information on safety issues

News

Information about new opportunities such as test licences, new features

Powerful Search

Based on semantic data



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The Siemens logo, consisting of the word "SIEMENS" in a bold, teal, sans-serif font, is positioned in the top left corner. Below the text is a horizontal white bar with a thin grey line above it.

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A man and a woman, likely medical professionals, are standing back-to-back in a clinical setting, possibly a CT scan room. The man is on the left, wearing a dark suit, and the woman is on the right, wearing a white shirt and a dark vest. They are both smiling and looking towards the camera. The background is a blurred view of a CT scanner.

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