



UniversitätsKlinikum Heidelberg

Open Source Software in a University Hospital

Prof. Dr. med. Björn Bergh

Chairman – Center of Information Technology and Medical Engineering

Professor for Medical Information Systems



Overview

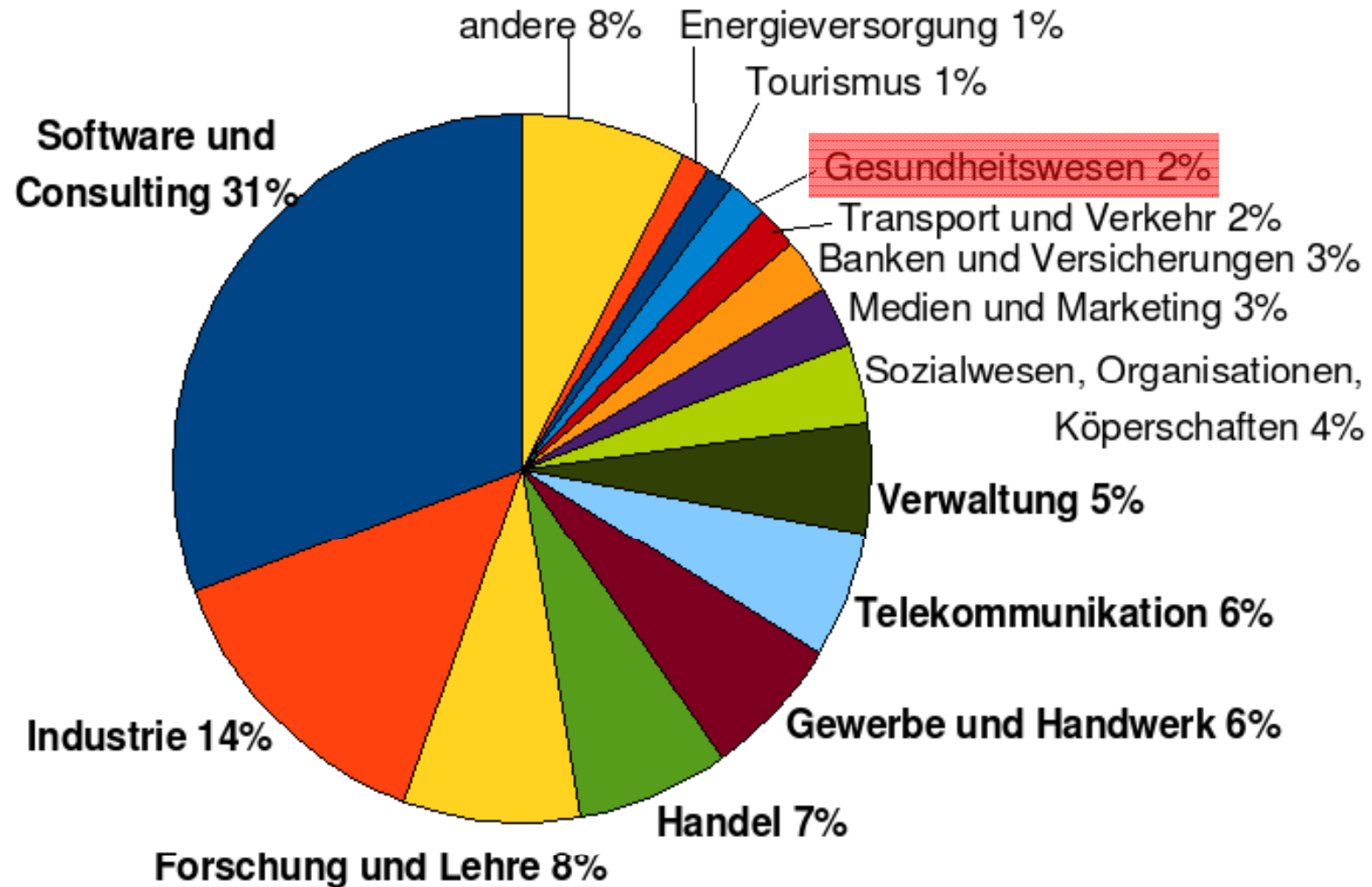
- What are the main domains of OSS?
- What do we do in Health IT (HIT)
- Where does it fit or why not?



Open Source Software in numbers

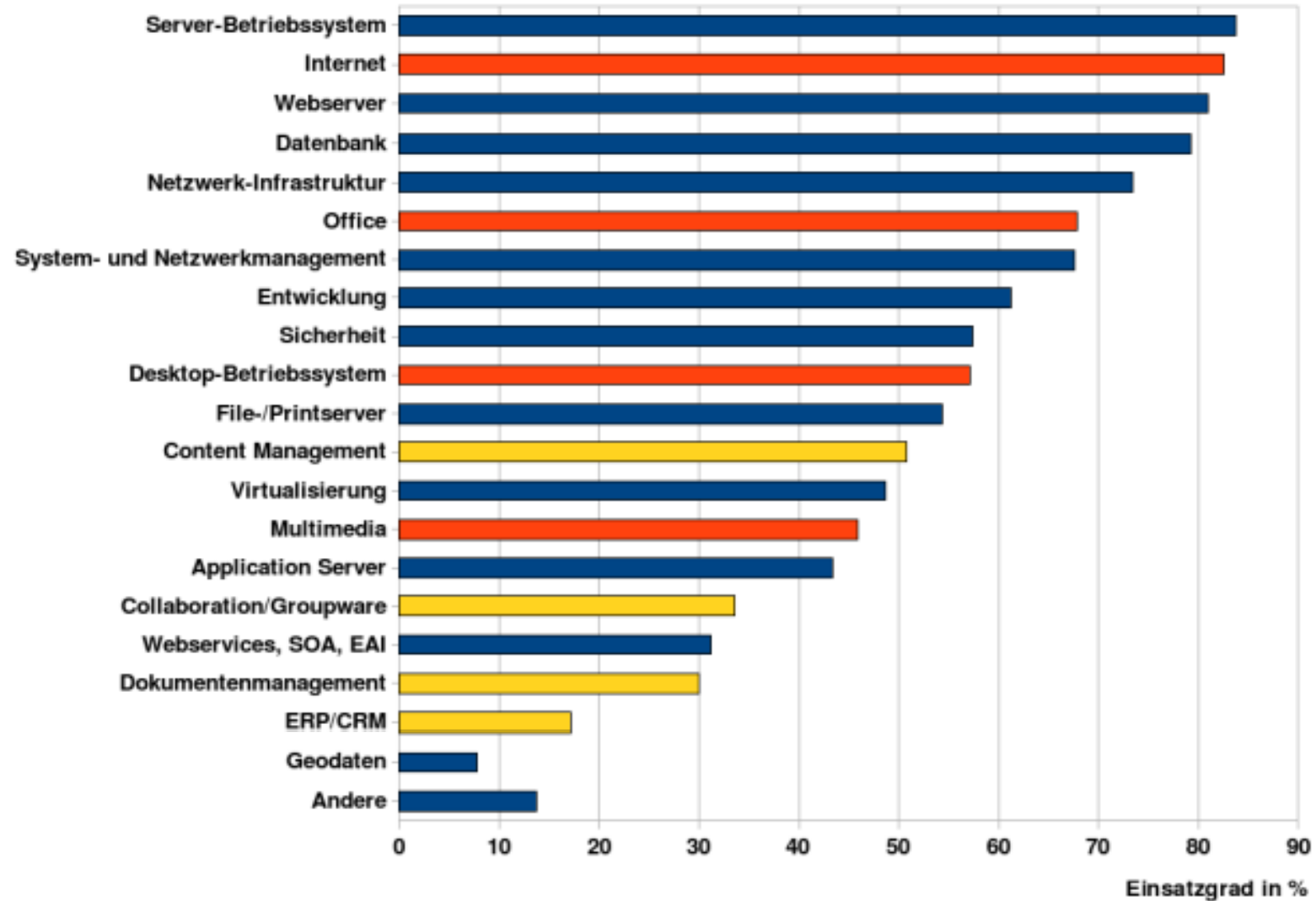


Branchen





Welche Open-Source-Software wird eingesetzt?



Source: Trendstudie Open Source, heise open and Wilken GmbH 2009



Healthcare IT (HIT)





Core facts



	Castle	Hospital/Faculty
Age	800 years	723 years (1386)
Visitors	1.000.000 pa	1.300.000 pa
Av. length of stay	90 min.	1200 min.
Ranking (in Germany)	9	1 (16 worldwide)
Employees	57	8500
Beds (in use)	-	2000



Centre of Information Technology and Medical Engineering (ZIM)

- 150 staff members
- Plans, purchases, implements + operates
 - all IT infrastructure, applications (incl. RIS, PACS, LIS. . .)
 - all medical devices + furniture
 - telephony, record archives...
- Scientific unit
 - eHealth, IT + med. engineering, radiological informatics, digital signatures



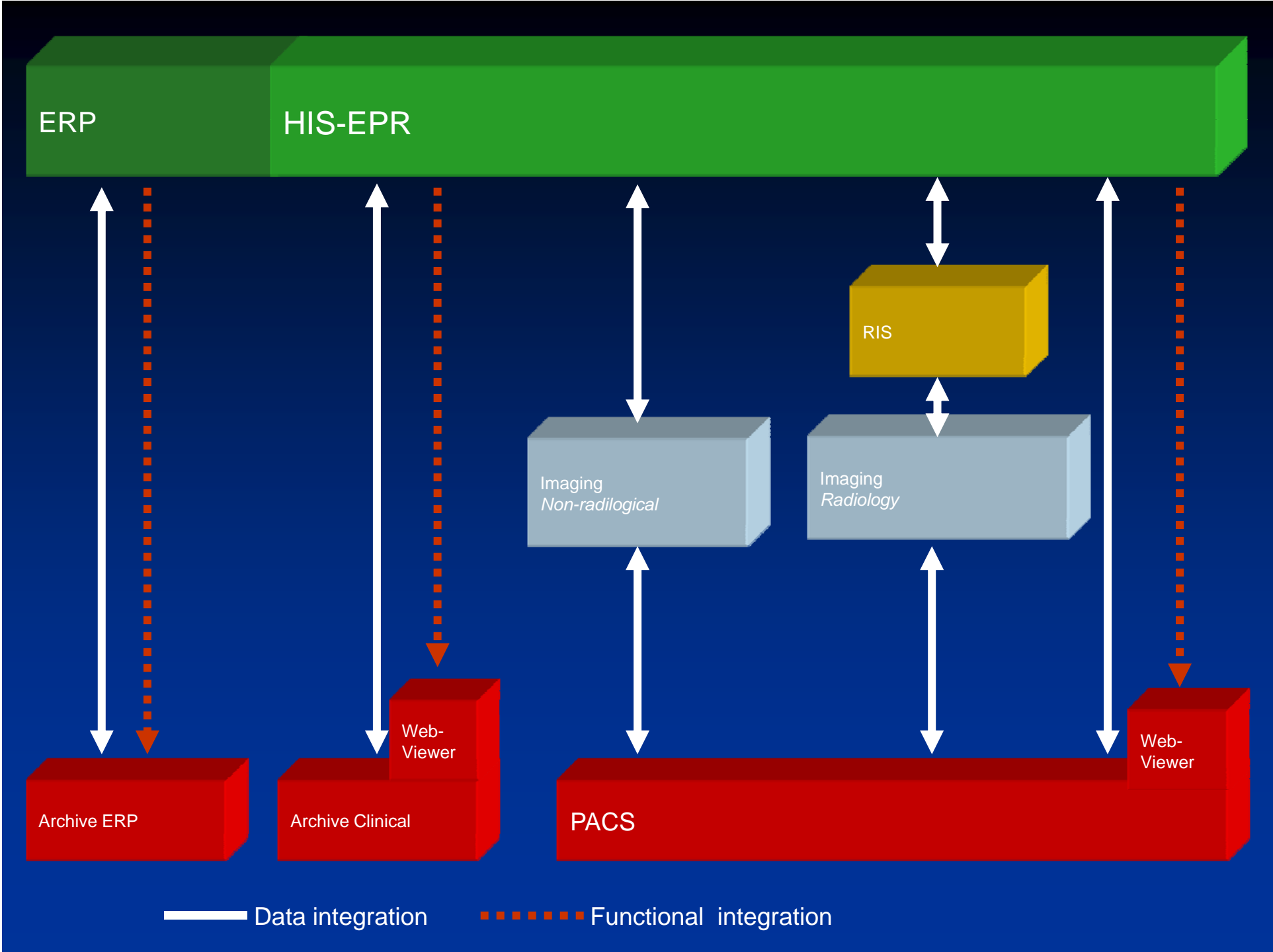
Infrastructure – PC + server

PC (automatic SW-distribution, asset management)	5500
Domain (1 central, MS Server 2007)	11509 accounts
eMail (Exchange, full GW, XCH 2007)	8668 accounts
Server (Wintel, Unix)	94, 35
Storage (without PACS)	58,6 TB
Backup Tape (without PACS)	138 TB
Availability	99,892 % only 25 min. unplanned



Core Apps

1. Enterprise Ressource Planning (ERP = SAP)
2. HIS + CIS
 1. Hospital Information System (SAP)
 2. Clinical Information System (GSD/Siemens)
3. PACS (GE)
4. Digital archiving solutions (Agfa)





Status Functionality

■ ERP

- Financials, equipment
- Materials
- HR
- Controlling
- Facility Management
- Hotelery (Food, Transport...)
- Travels, Real estate,
- Warehouse

■ HIS

- In- Out- patient management
- In- Out- patient billing
- Coding Diagnosed + Procedures
- DRG-Workplace
- Tools medical Controlling



Status Functionality - EPR

■ Available reports

- Lab
- Radiology
- Pathology
- Intensiv care (PDMS)
- Endoscopy
- Cath lab
- Archived files
- Multiple...

■ Functionality

- Discharge letters
- OR planning
- OR documentation incl. QA
- Scheduling
- Order communication
- Digital dictation
- Digitale signature
- Nursing documentation
- Workflow planning (OR/beds)
- Decision support (DSS)
- Charting
- Clinical pathways



Status Functionality - Subsystems

■ Departmental

- Pathology
- Radiology (RIS)
- Lab (centralised)
- Cardiology
- Anaesthesia
- Obstetrics
- Cardiac surgery
- ...

■ Interdepartmental

- Intensive care (PDMS)
- Monitoring
- EKG
- Endoscopy
- Sonography
- Spirometry
- EEG



Applications

	IS-H	BWV
Named User	6.345	3.270
Concurrent User	1.500	410
Document types	545	
New documents/year	5.883.811	
Orders/month	25.000	
Communication interfaces	57	
Messages (HL7)/week	1.650.000	



PACS – core data

Connected modalities	~200
RIS PC	380
PACS Workstations	180
Examinations/year	320.000
Data production/year (TB = Terabyte)	24 TB
Storage PACS	108 TB



Summarised HIT requirements

- Operations
 - Stability + availability
 - Support + warranty
 - Stick to the market leaders and clear trends (main stream strategy)
 - Do not deviate, use detours, side roads
 - It is already complex enough to get things done, don't introduce more complexity
 - Interdependency between SW packages
 - Don't try things unless in side domains
 - Shortage of fundings



Open Source Software in Healthcare IT (HIT)



OSS in HIT - Why?

- Costs
- Deficits of existing SW
- Specific requirements
- Too slow development of exiting SW
- Connectivity



OSS in HIT – Why not?

- Technical
 - HIT applications impose a certain environment
 - Client SW compatibility
- Costs, resources and efforts
 - Feasibility study - upfront investment without definite outcome
 - Risk - Warranty + support
 - Staff qualification – time, second team, education + training
 - Establishing practical know-how and experience (risk)
 - Migration efforts (SW customization and additional development, „off-the-shelf“), testing SW compatibility
- Legal issues
 - Medical devices SW
 - Certification + Liability?



Areas of application of OSS in HIT

- General
 - Standard solutions not related to specific SW requirements
 - Where HIT apps do not impose requirements
 - New techniques and solutions
- Infrastructure
 - Some servers (Linux)
 - Windows 7 costs?
- Apps – not HIT specific
 - Internet + Web Server
 - Content Management systems
- Apps –HIT specific
 - PACS viewers?
 - **Systems integration (eGate)**
 - **eHealth and integration!**
 - Research and Teaching



Thank you!

University Hospital Heidelberg
Center of Information Technology
and Medical Engineering (ZIM)

Tiergartenstr. 15 | 69121 Heidelberg | Germany

Prof. Dr. med. Björn Bergh (Director ZIM)

Mail bjoern.bergh@med.uni-heidelberg.de

Fon +49 6221 56 2000

