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Medfloss.org – A comprehensive open information portal for medical free/libre and open source software

H. Schmuhl[1,4,5], H. Demski[2,4,5], T. Karopka[3,4,5], B. Bergh[1,6]

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LinuxTag 2012 - Open Mind Economy, 24th of May 2012

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Disambiguation
Free Software, Open Source, Medical FLOSS

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- *Free Software* (Free Software Foundation)
- *Open Source* (Open Source Initiative)

Most licenses in this field compliant to both definitions

- *Medical Free/Libre and Open Source Software (FLOSS)*
  - Professional software or supporting components
  - Designed specifically for the health care domain
  - Used in daily routine at hospitals, GPs

Health care domain I

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Health care domain is *very specialized* also in terms of software:

- dedicated and substantial communication and information representation standards
- numerous and diversified terminologies and encoding systems
- profound legal regulations
- unique requirements regarding the maintenance and availability
- dynamic and ever changing environment concerning underlying medical knowledge and regulatory implications
- criticality to life

Health care domain II

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However health care is also a field, in which nearly everyone has to cope with *similar* problem:

- nowadays nearly every workflow is assisted by or based on software
- strong cost pressure
- heavy workload
- new requirements constantly arise
- highly dynamic field of expertise
- "Big Data"

Users' perspective
Bundesverband Gesundheits-IT - Branchenbarometer 2012

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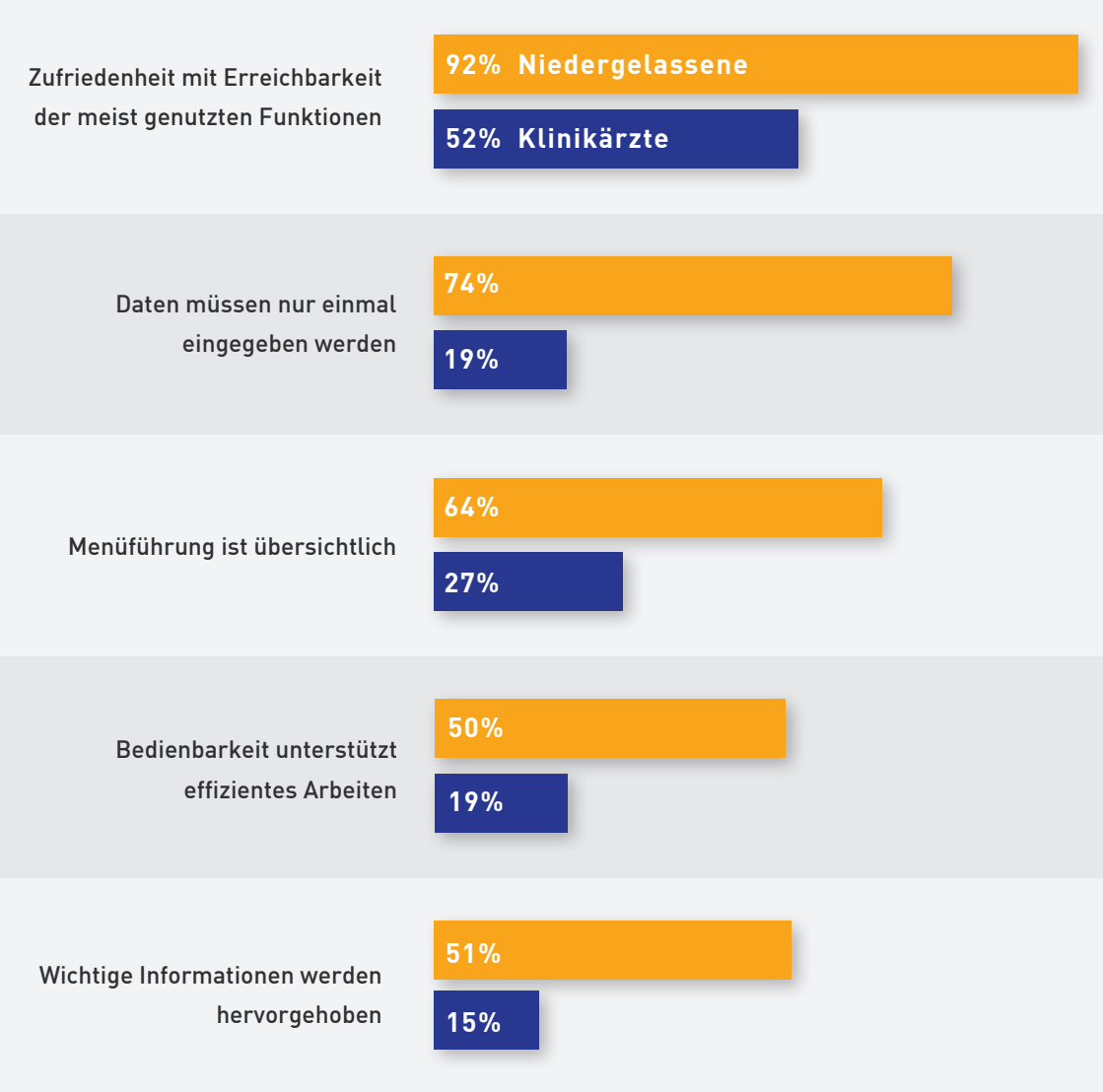
Clinical users in general not satisfied with current software systems.



Source (bvitg e.V.): http://www.bvitg.de/branchenbarometer.html

Collaboration

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What about *collaborative software development* and the *open and free/libre exchange of code and related knowledge and expertise*?

Regarding their professional medical knowledge and skills, physicians are adhering to this principle since centuries.

References in literature
Any relevance in medical informatics?

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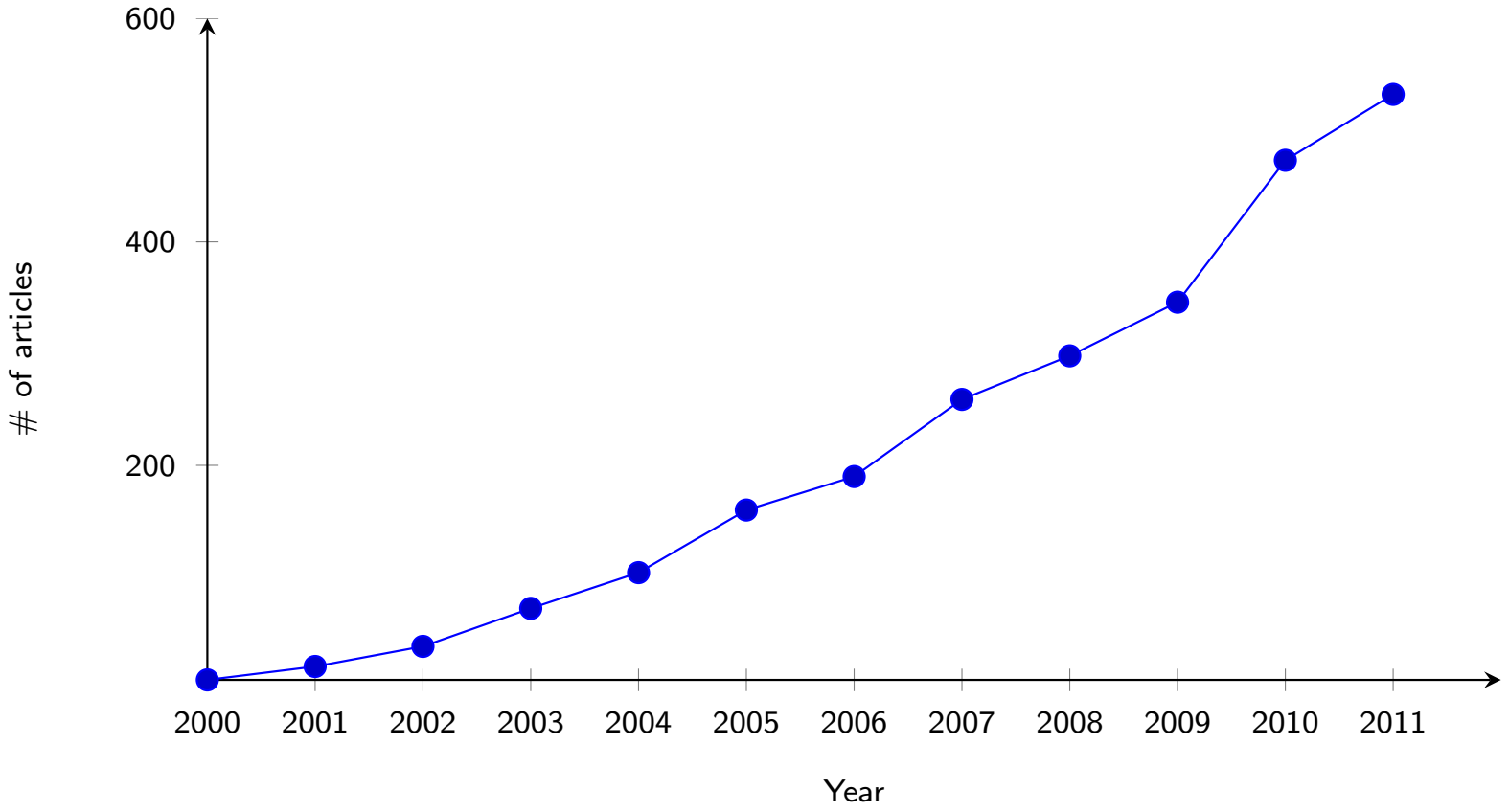
Number of publications containing the keyword "Open Source" at PubMed (MEDLINE)[1]



[1] http://www.ncbi.nlm.nih.gov/pubmed/

IT executives' perspective

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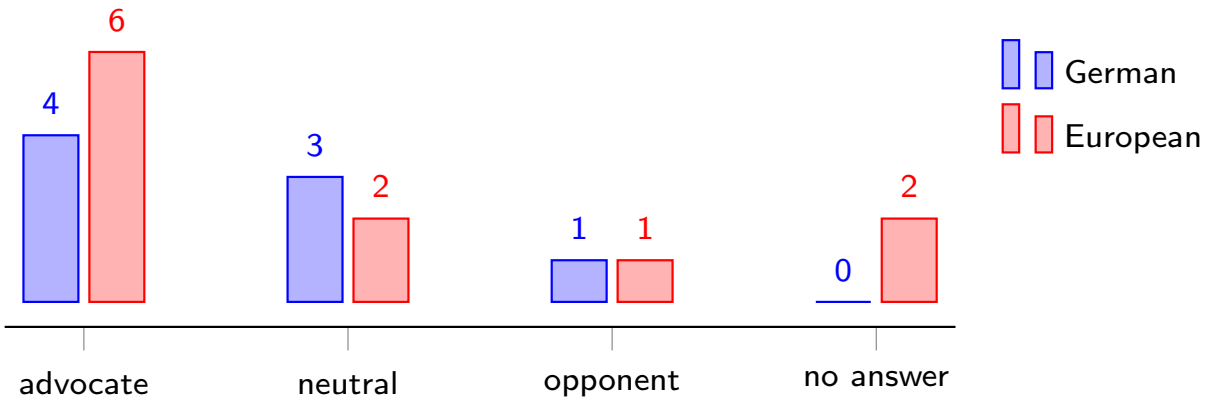
- 8 German and 11 European current or former IT executives of university hospitals interviewed in 2011 [1]
- Would you denoted yourself more like an opponent or advocate of Open Source?



- What medical Open Source software are you using in clinical routine?

NONE.

Why is FLOSS not utilized?

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No medical FLOSS projects available?

VistA
Sample projects

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Veterans Affairs VistA (EHR, HIS)[2]

- Initiated in the 1970s, meanwhile consisting of 160 integrated software modules
- Public domain EHR utilized in the U.S. Veterans Health Administration (VistA) and Indian Health Service (RPMS)
- Deployed at 2500 sites, about 30 million patient records within the U.S. [2], various deployments in more than 13 other countries

[2] Links: http://www.hardhats.org/, http://www.osehra.org, http://vistapedia.net/, http://en.wikipedia.org/wiki/VistA

OsiriX and OSCAR McMaster
Sample projects

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OsiriX (PACS Workstation), http://www.osirix-viewer.com/

- LGPL licensed, Objective-C/Cocoa based DICOM Viewer and image processing software
- FDA cleared/certified version available
- 50,000 users, 200 official reference sites worldwide[3]

OSCAR McMaster (EMR, PMS), http://oscarmcmaster.org/

- GPL licensed, Java based EMR with Web UI
- More than 8 companies offering professional service
- More than 1,000 users in Canada, according to EMR Advisor[4] 16.6 % market share in Ontario

[3] Source: http://www.osirix-viewer.com/Users.html
[4] Source: https://www.emradvisor.ca/compare

COMS and PORS
Own projects

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Consent Management Suite (COMS)

for the management of patients' consent

Provider and Organization Registry Service (PORS)

for the identification of healthcare providers

- Central components of the standards-based PEHR infrastructure for the Rhein-Neckar region [3, 4]
- Developed by the Dept. for Information Technology and Medical Engineering, University Hospital Heidelberg
- Soon to be released via Open eHealth Foundation

Many more . . .
Projects

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Let's try and find some in the wild . . .

Code repositories
Popular project hosting platforms

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CodePlex (http://www.codeplex.com/)	28,307 projects	Microsoft, Inc.
GitHub (https://github.com/)	4,656,680 projects	GitHub, Inc.
Google Code (http://code.google.com/hosting/)	250,000 projects	Google, Inc.
Joinup (https://joinup.ec.europa.eu/)	407 projects	European Commission
Launchpad (https://launchpad.net/)	26,862 projects	Canonical Ltd.
Savannah (http://savannah.gnu.org/)	3,428 projects	FSF
Sourceforge (http://sourceforge.net/)	324,000 projects	Geeknet, Inc.

Statistics as of 04/2012, no recent data available for Google Code (last info dated 03/2011).

Databases
of available medical FLOSS projects

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- OLEX OpenLogic Exchange, http://olex.openlogic.com/ (529 projects[5])
- Open Health News, http://openhealthnews.com/ (about 140 projects)
- Sourceforge.net, http://sourceforge.net/ (1,054 projects[6])
- Wikipedia list of open-source healthcare software, http://en.wikipedia.org/wiki/List_of_open_source_healthcare_software (about 50 projects)

[5] projects tagged with "Medical Science Apps."
[6] projects tagged with "Medical Science Apps."

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Too complicated to compile from source?

Linux Distributions
offering ready-to-run medical FLOSS projects

Packaging teams who create one-click install packages (like .DEB or .RPM files) for popular Linux distributions:

- Debian Med: http://www.debian.org/devel/debian-med/
- openSUSE Medical: http://en.opensuse.org/Portal:Medical
- Fedora Medical: http://fedoraproject.org/wiki/SIGs/FedoraMedical

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Nobody cares?

Organizations

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Working groups

of professional societies:

- International Medical Informatics Association (IMIA) [5]
- European Federation for Medical Informatics (EFMI)
- American Medical Informatics Association (AMIA)
- International Society for Telemedicine and eHealth (ISfTeH)

Non-profit organizations

formed by companies and health care providers:

- Open Health Tools, http://www.openhealthtools.org/
- Open eHealth Foundation, http://www.openehealth.org/

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Resources are scattered all over the information space?

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- No comprehensive repository (database) of FLOSS dedicated to health informatics available
  - Comparability not given: no sufficiently structured information about projects available, no unified terminology used
  - Relevant projects for specific purpose cannot be identified or narrowed down
- Missing lobby and marketing machinery
- Original sources may lack detailed further information like number of deployments, reference sites/success stories, professional service providers and scientific publications

Medfloss.org
The Medfloss.org Web site [6, 7]

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Medfloss.org provides a comprehensive and structured overview of FLOSS projects in the domains of medical informatics and health care. It is an open information portal that aims to foster the exchange of ideas, knowledge and experiences about existing projects and the related ecosystem.

- Online since Feb. 2010, based on Drupal
- Users can add and modify any content, free registration required to prevent Spam
- Language: English, requests for French and Spanish translations
- Provided in cooperation with the IMIA OS WG, EFMI LIFOSS WG, Helmholtz Zentrum München and the University Hospital Heidelberg.

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Structured and interlinked information

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- Tags in numerous categories, like Application Type e.g. "PACS", Enterprise Function [8] e.g. "Medication Management", supported Standard e.g. "HL7" / "DICOM", ...
- 267 projects
- 87 professional service providers
- 145 scientific publications
- 27 events (conferences, trade shows)
- 43 organizations and other resources (Web sites, etc.)
- Linux distributions

Medfloss.org
Future development

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What is good?

- One of the most comprehensive and complete information portals about medical FLOSS
- Well accepted: 4,000 unique visitors per month with 14,000 page views, feedback in form of additions and corrections

Roadmap

- Improve user experience
- Integrate more data: reference sites, medical device class, community metrics, ...
- Improve quality of data: assure up-to-dateness, rework terminology

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So Medfloss.org is the cure for everything?

What else to bare in mind?
Utilization of FLOSS in health care

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- Functionality counts and not the type of license
- IT departments / guys
  - Do not like migrations, users do not like new systems
  - Have quite limited resources
  - Prefer to keep the number of vendors as high as needed and as low as possible
- Are there any professional service providers?
  - Responsibility and accountability (medical devices act) is the key
  - Combination of "Best of Breed" and "Single Vendor" IT strategies

What else could be done?
Utilization of FLOSS in health care

- Continue to promote and discuss the usage of FLOSS in health care
- Clarify legal requirements (medical devices act)
- Commitment of government and health care sector to
  - Encourage and fund the utilization of FLOSS
  - Establish a working ecosystem
  - Assist via competence center(s)
- Use Medfloss.org to present and promote your project, company or assist others with your expertise

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- Do you know the idiom *rocket science* to state that something is "overly complex, detailed or confusing"? Well even the NASA relies on FLOSS ... why shouldn't this work out for health care?
- Medfloss.org is just one means to address this issue, you are welcome to join!

Discussion
Discussion, Questions and Answers

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Thank you for your attention!

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