Carnegie Mellon
SCHOOL OF COMPUTER SCIENCE

VistA Ecosystem: Critical Choices for Robust Innovation

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Background

- Collaboration and software engineering
- Radical changes in the way systems are built
  - Ultra-large scale
  - Decentralization
  - Inherently conflicting, unknowable, and diverse requirements
  - Continuous evolution and deployment
  - Heterogeneous, inconsistent, and changing elements
  - Erosion of the people/system boundary
  - Normal failures
  - New paradigms for acquisition and policy

Northrop, et al, *Ultra-Large-Scale Systems The Software Challenge of the Future*

Asking a different question

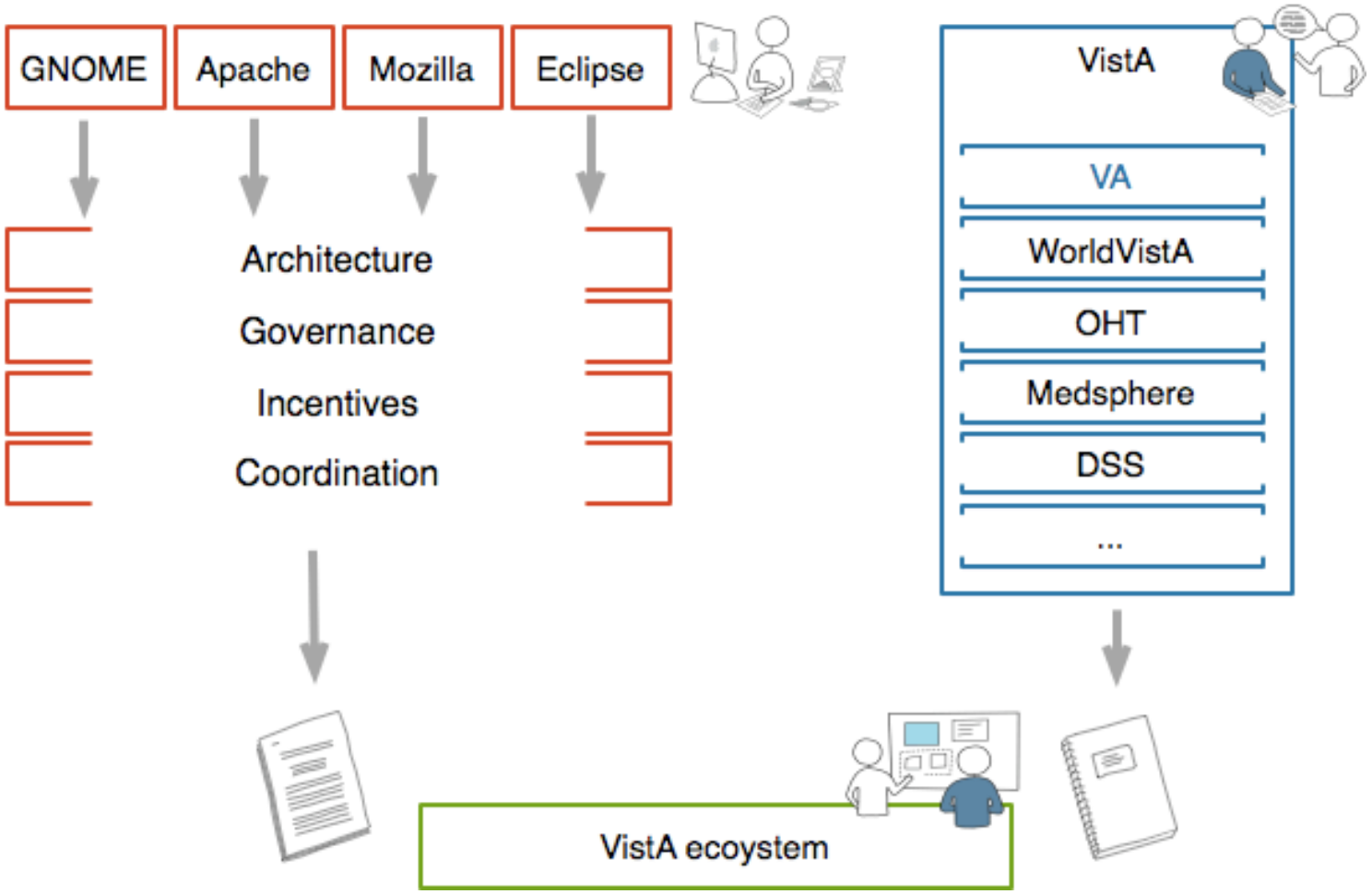
- Rather than ask
  - "How can I specify, design, and build the system that my stakeholders need?"

- Maybe we should ask
  - "How can I set up the socio-technical system that will allow users, developers, businesses, and everyone else to cooperatively build what all my stakeholders need?"
  - "Even though those needs are currently unknowable and evolving . . ."

Research project: "Benchmark" VistA Ecosystem

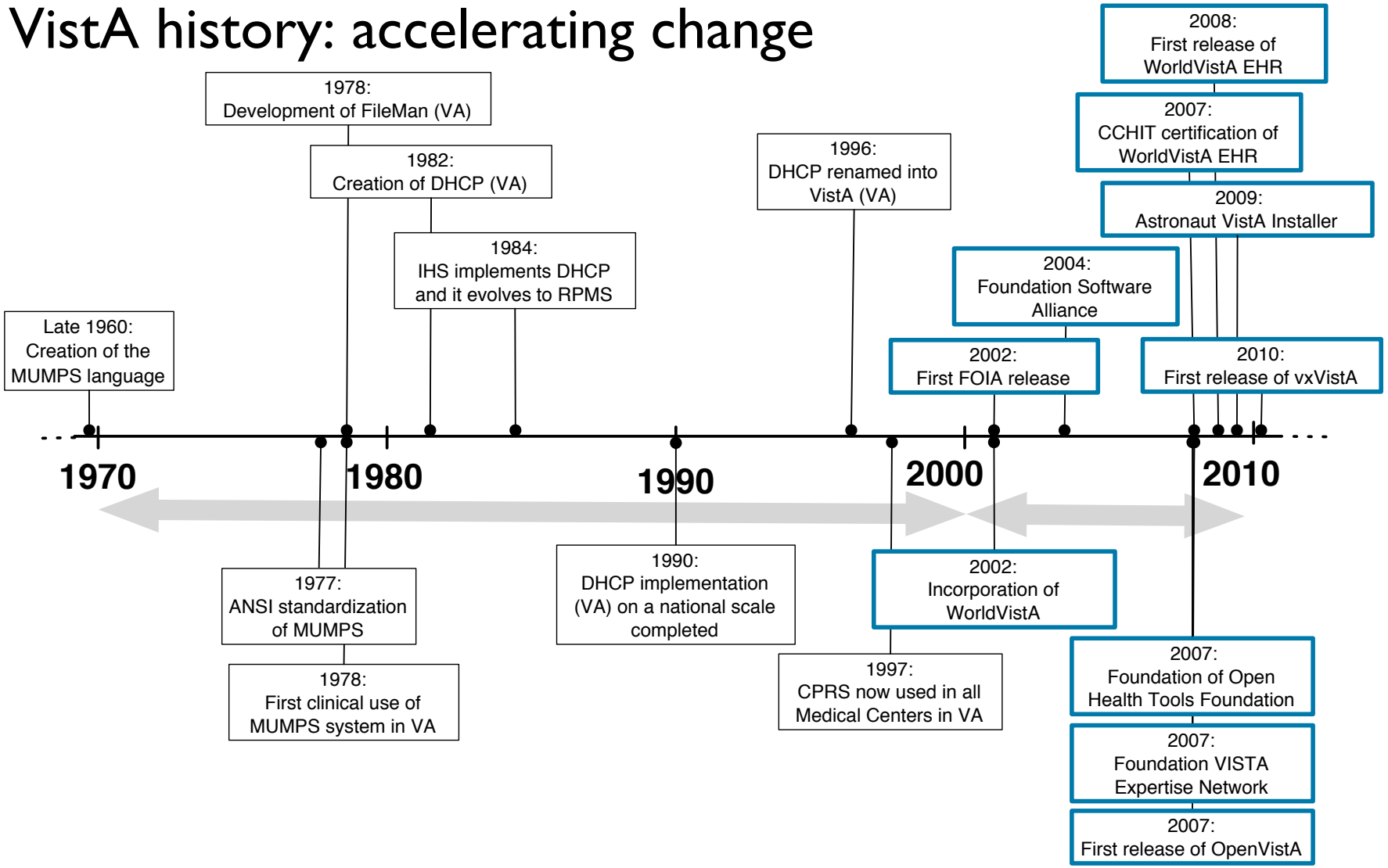
- Motivation
  - Studying software practice in the increasingly important area of open-source health care
  - Identifying design principles of successful large-scale ecosystems (interplay of technical and social architectures) and verifying their applicability
  - Unique possibility to actively assist in the further development of an emerging ecosystem
- Goals
  - Exploratory study of the socio-technical architecture of the VistA ecosystem
  - Comparison and gap analysis with other large ecosystems

Research design:
What can we learn from other successful ecosystems?



VistA –
an emerging open health information ecosystem

VistA history: accelerating change

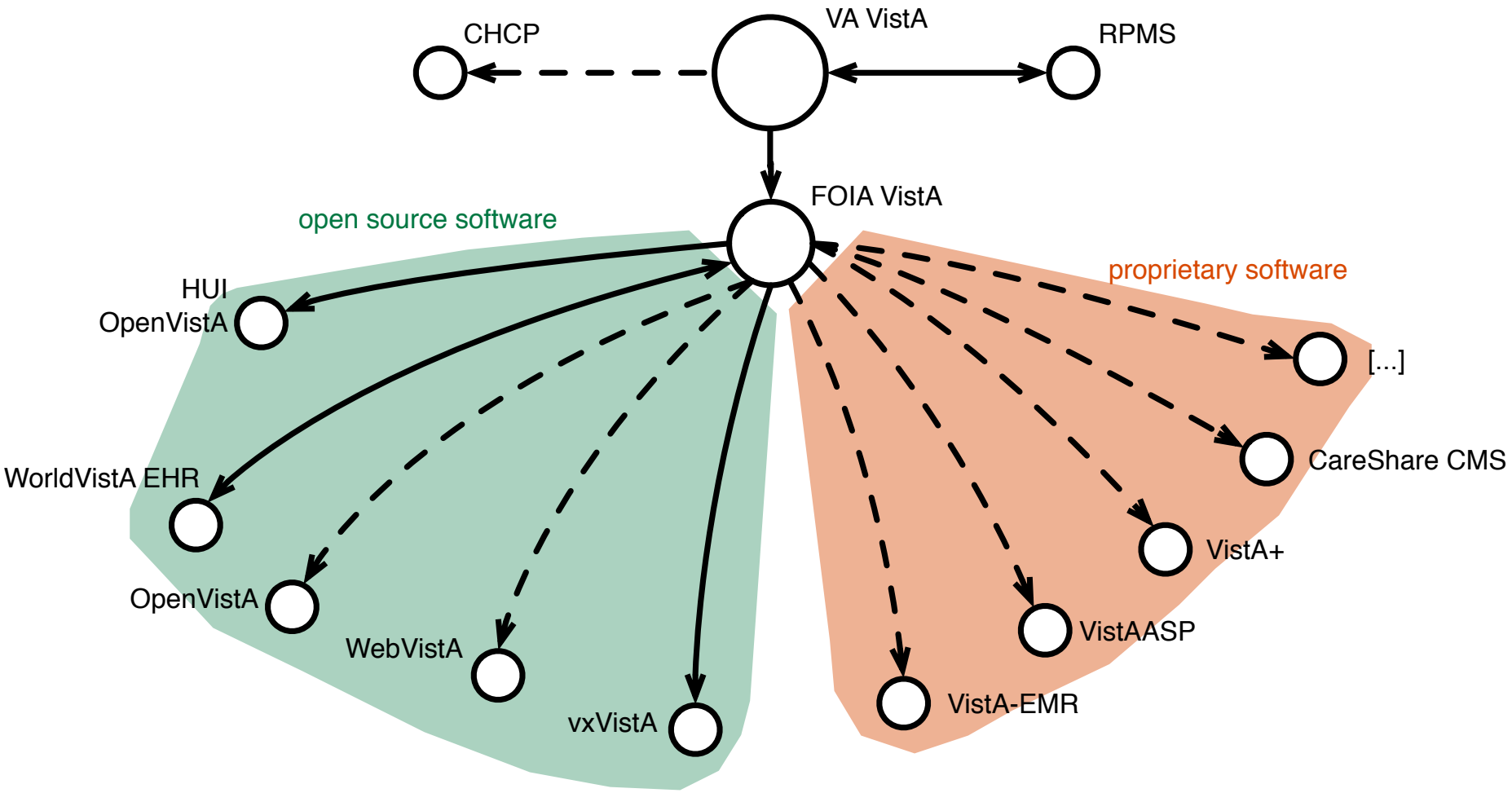


Number of implementations

Application name	**Vendor/implementor**	**# patient records**	**# sites**
Non-Government:			
ClearHealth	ClearHealth, etc.	3,020,000	830
WorldVistA EHR/VOE 1.0	Sequence Managers, etc.	293,195	16
RPMS EHR 1.1	Community Health Network of WV	242,816	30
OpenVistA 1.5	Medsphere Corp.	213,948	18
FOIA VistA	DSS Corp., etc.	189,106	4
Subtotal Non-federal		3,959,065	898
Government:			
VistA	Department of Veterans Affairs	23,442,000	1,007
RPMS EHR 1.1	Indian Health Service	≈1,000,000	600
Subtotal Government		≈24,442,000	1607
Total		**28,401,065**	**2,505**

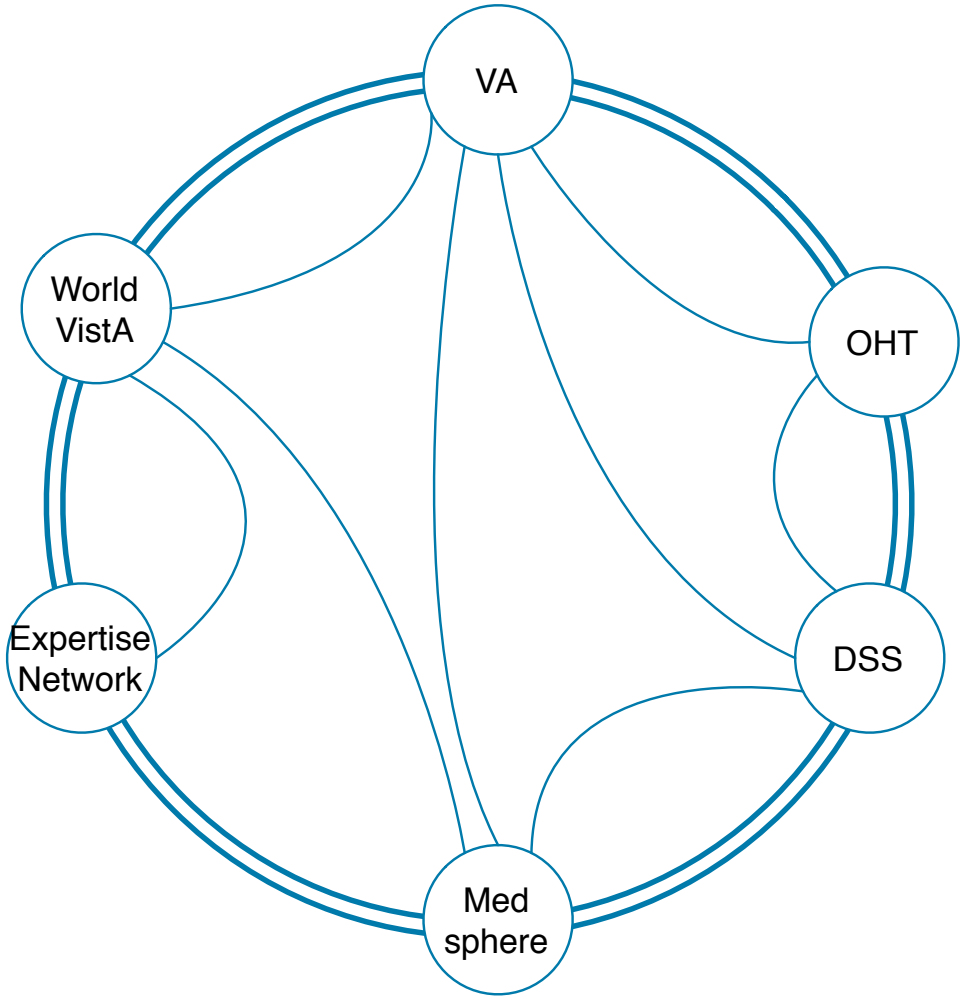
From Valdes, 2008

Diversity of FOIA VistA-based distributions



Who are the VistA community?

- Different motifs, either community initiated or sponsor (company) founded
- Each main member of the VistA community tries to build its own "ecosystem"
- Collaboration between members exist to a certain extent



What kind of concerns or challenges are seen by the community?

Summary of interview participants

Classification criteria	Number
Number of participants	
Total interviewees	21
Total interviews	24
Used medium	
Telephone interviews	9
In-Person interviews	15
Affiliation(*)	
Software vendor	11
Non-profit organization (501(c)(3), (6))	8
Department of Veterans Affairs	4
Roles(*)	
Developer	7
Implementor	8
Vendor	11

(* partly multiple assignments per person)

Last update in April 27, 2010

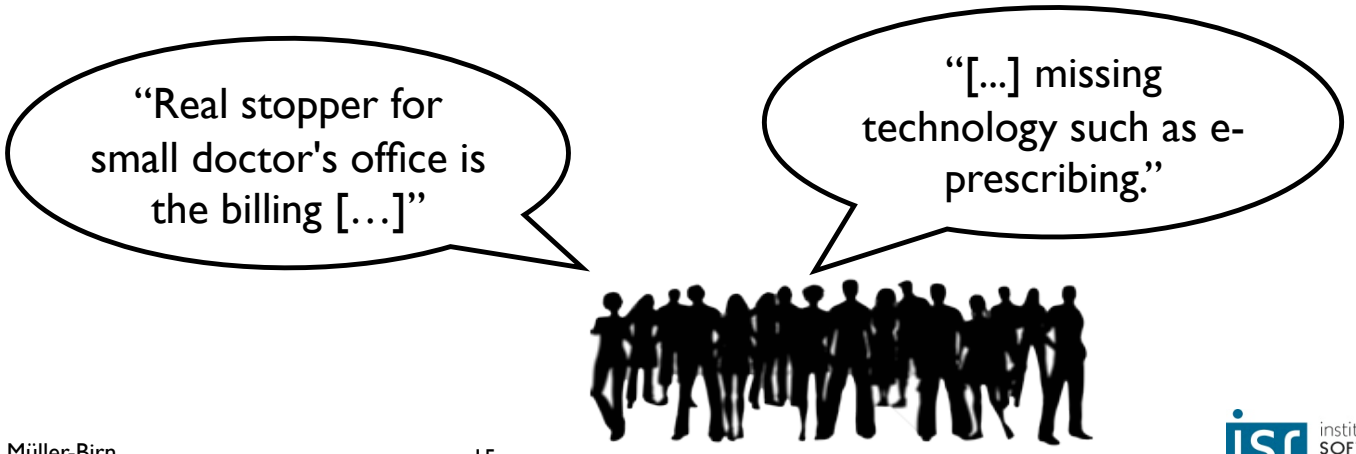
"Survival of VistA is closely connected to the survival of the VistA ecosystem"

Increasing fragmentation

- Fragmentation is too high for this size of the community
- Adopters are insecure about survivability of different distributions
- No clear path to a single distribution → necessity to minimize variations between the flavors of VistA
- Developer pool is very small and becomes smaller because of the growing number of distributions

Missing functionality

- More API's for external modules are needed, such as the existing one for billing
- Need for a different architecture
- Demand for configuration tools for small hospitals
- Existing interfaces are too complicated for small offices
- Implementation of criteria for "meaningful use"

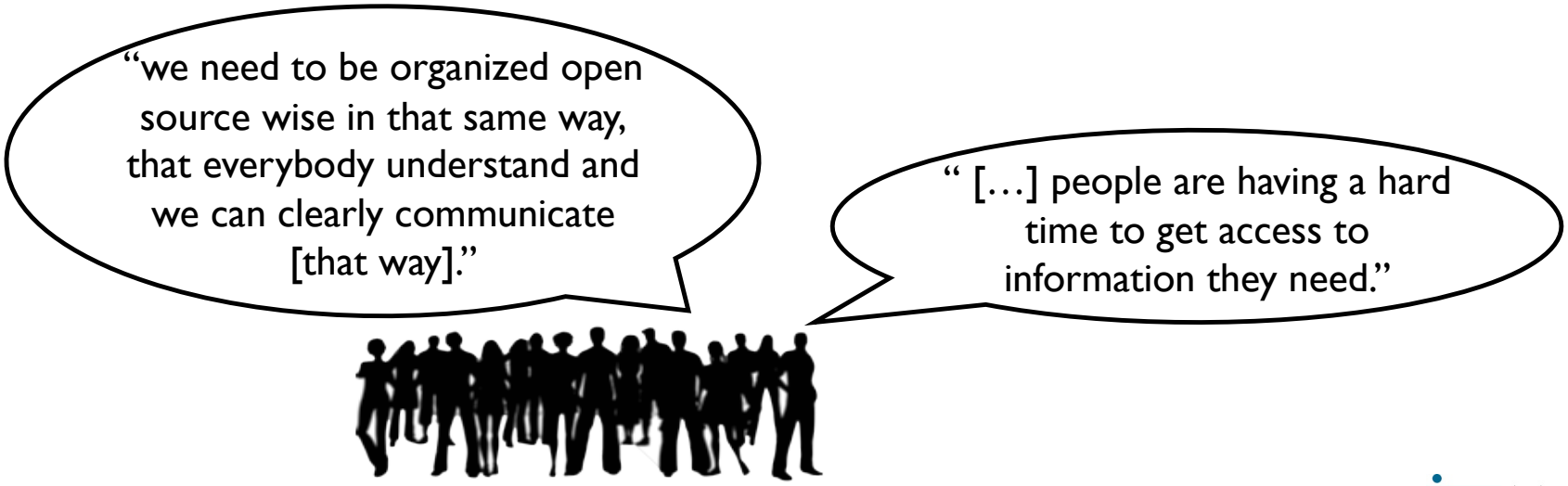


Various interest groups

- VA is needed as part of the community
- More engagement of users necessary → creation of a user-driven community
- Balance needed between the different interests and the type of license
- Missing "umbrella" organization or consortium that unifies the community

Low awareness and lack of communication

- Providing information more efficiently
- Promoting equally all flavors/distributions by highlighting their advantages and differences
- Better communication of the open source software model and its value



What are possible development lines of the VistA open health ecosystem?

VistA is a unique situation

- Largest integrated health care information system in the US
- Development is almost completely done by a governmental organization
- Software is mainly based on a limited-used programming language
- Area of application requires specific regulations, standards, and specifications that are under continuous change
- Community is hybrid (community initiated and sponsor founded)

Is this community and its needs really unique?

Possibility 1: Fragmentation

- Duplicated effort
- Loss of co-opetition benefits
- Much smaller pie
- Conflict, lawsuits

Éric Lévénez, http://www.levenez.com/unix/

Possibility 2: One "unified" ecosystem

- Several difficult issues must be resolved, including
  - Converge on a single "platform"
    - Co-opetition is key: competitors *and* complementers
  - Resolve IP issues in compatible way
  - Establish governance regime that allows all stakeholders to have a voice yet ensures necessary coherence
  - Improve the technology to facilitate collaboration and evolution
  - Optimize participation of the VA

Conclusion

- Our research
  - Comparison of VistA ecosystem to others
  - Analysis of gaps
  - Discussion of alternative directions
- Our goal: Help to support and inform the community

- This is a unique moment in the history of technology and in the history of health care!

Questions?