



Challenges of a Sustainable Software Platform for Predictive Biology: Lessons Learned on the KBase Project

**Dan Gunter
LBNL**

What is KBase?



Open software and data platform for addressing the grand challenge of systems biology:

Predicting and designing biological function



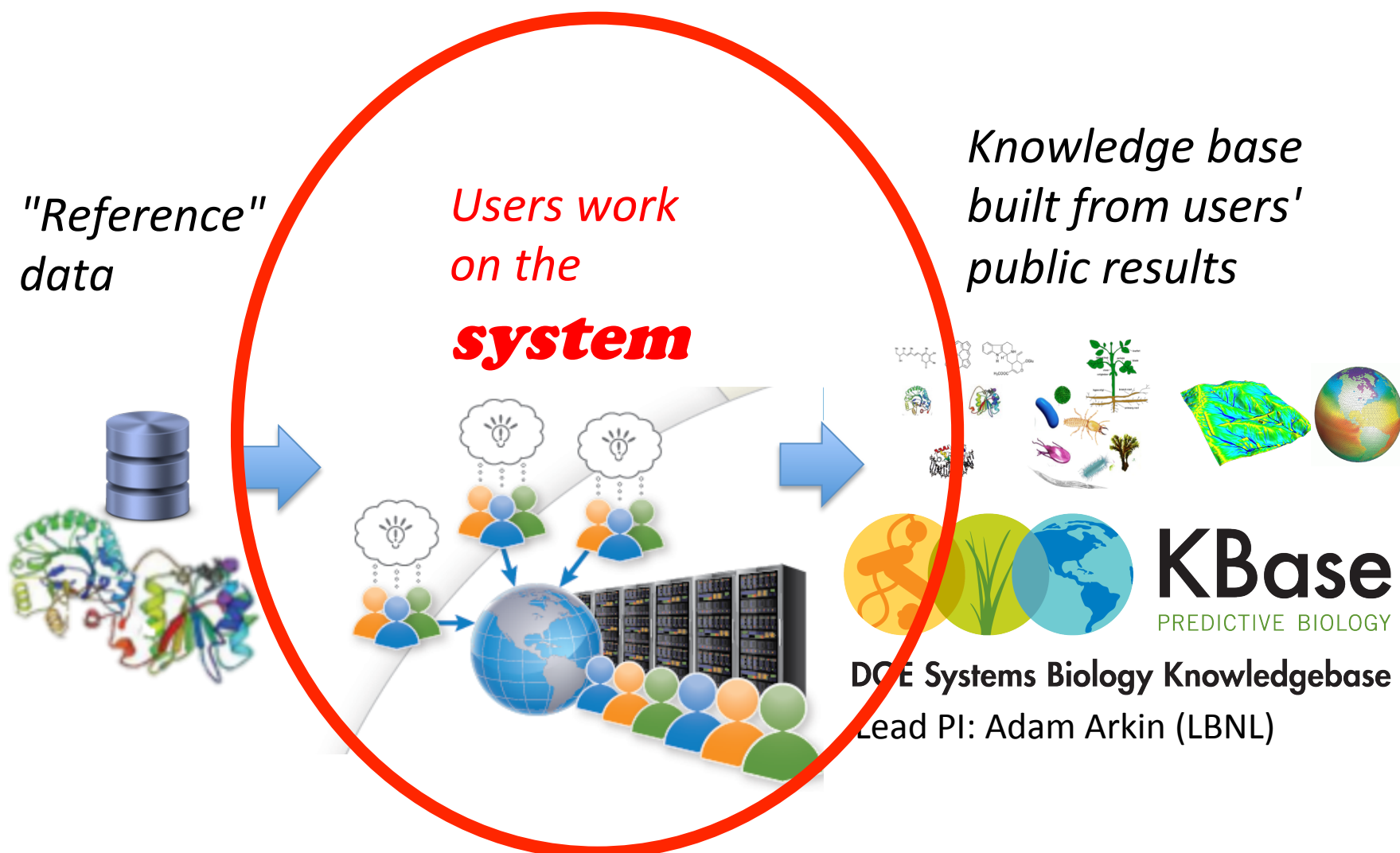
Unified system that integrates data and analytical tools for comparative functional genomics of

microbes, plants, and their communities



Collaborative environment for **sharing methods and results** and placing those results in the context of knowledge in the field

What do we need to build?



Multi-institutional project



Lawrence
Berkeley
National
Laboratory

Lead institution



Argonne
National
Laboratory



Brookhaven
National
Laboratory



Oak Ridge
National
Laboratory

Cold
Spring
Harbor
Laboratory

University
of
California,
Davis

Hope
College

University
of Illinois
at Urbana-
Champaign

Yale
University

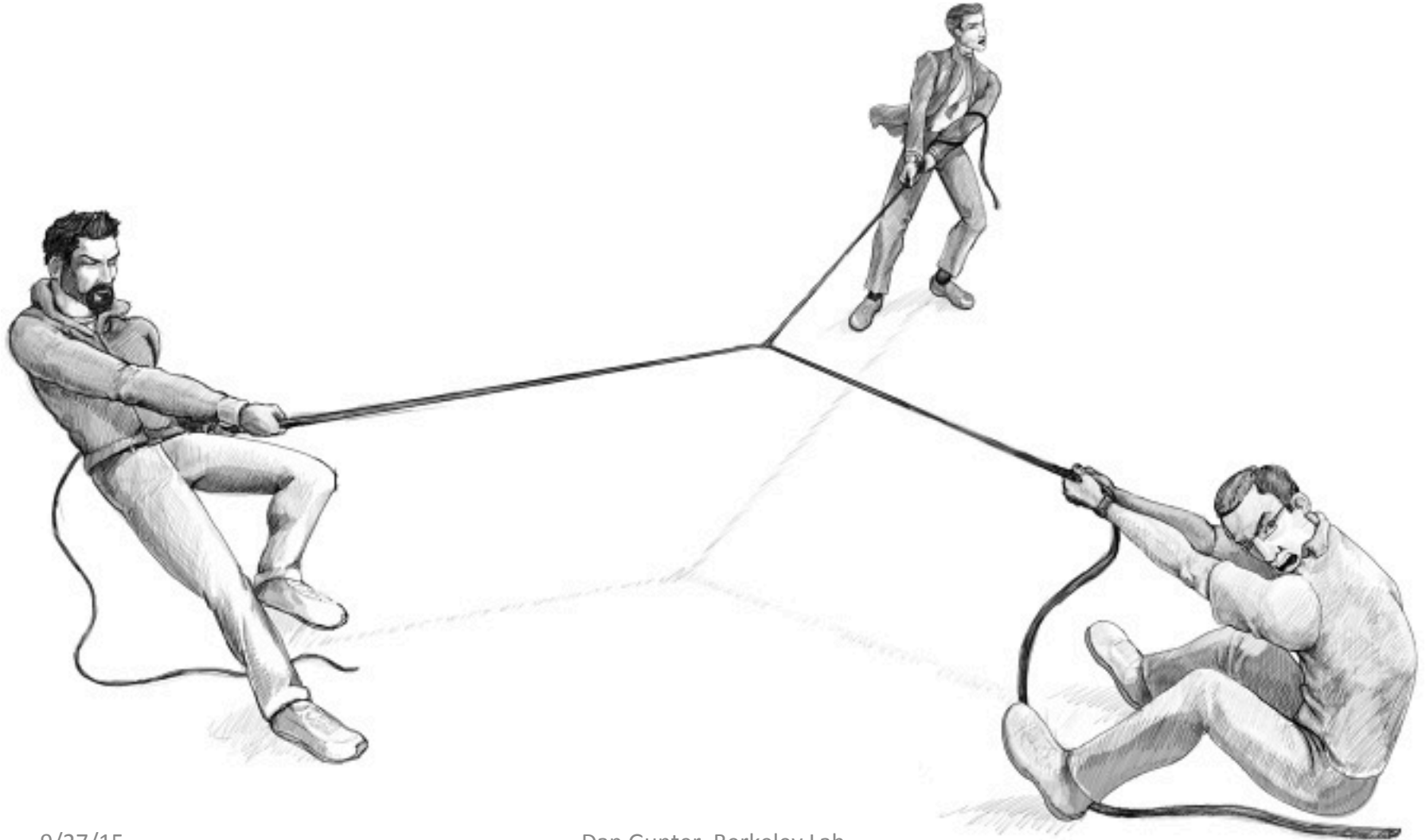
University
of
Tennessee



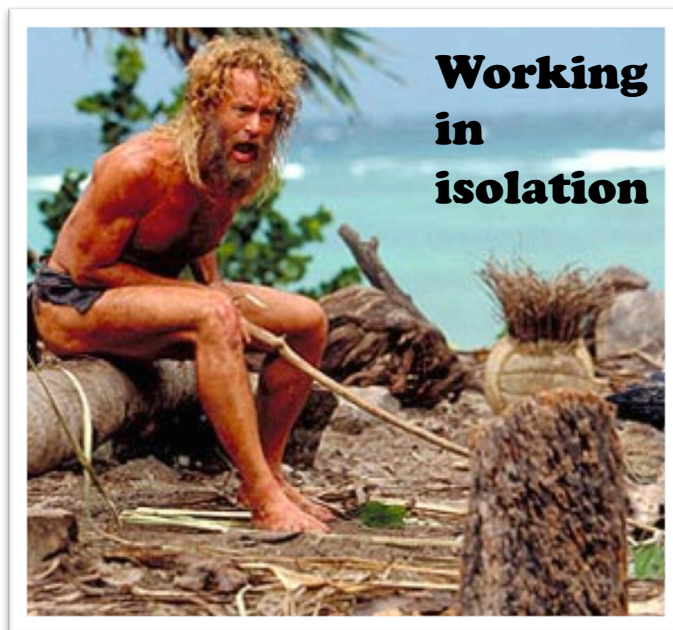
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Dan Gunter, Berkeley Lab

Challenge: pull together to make a single, maintainable system



What doesn't work



Type	Outlet	Plug	Type	Outlet	Plug	Type	Outlet	Plug	Type	Outlet	Plug
A			G			M			S		
B			H			N			T		
C			I			O			U		
D			J			P			V		
E			K			Q					
F			L			R					

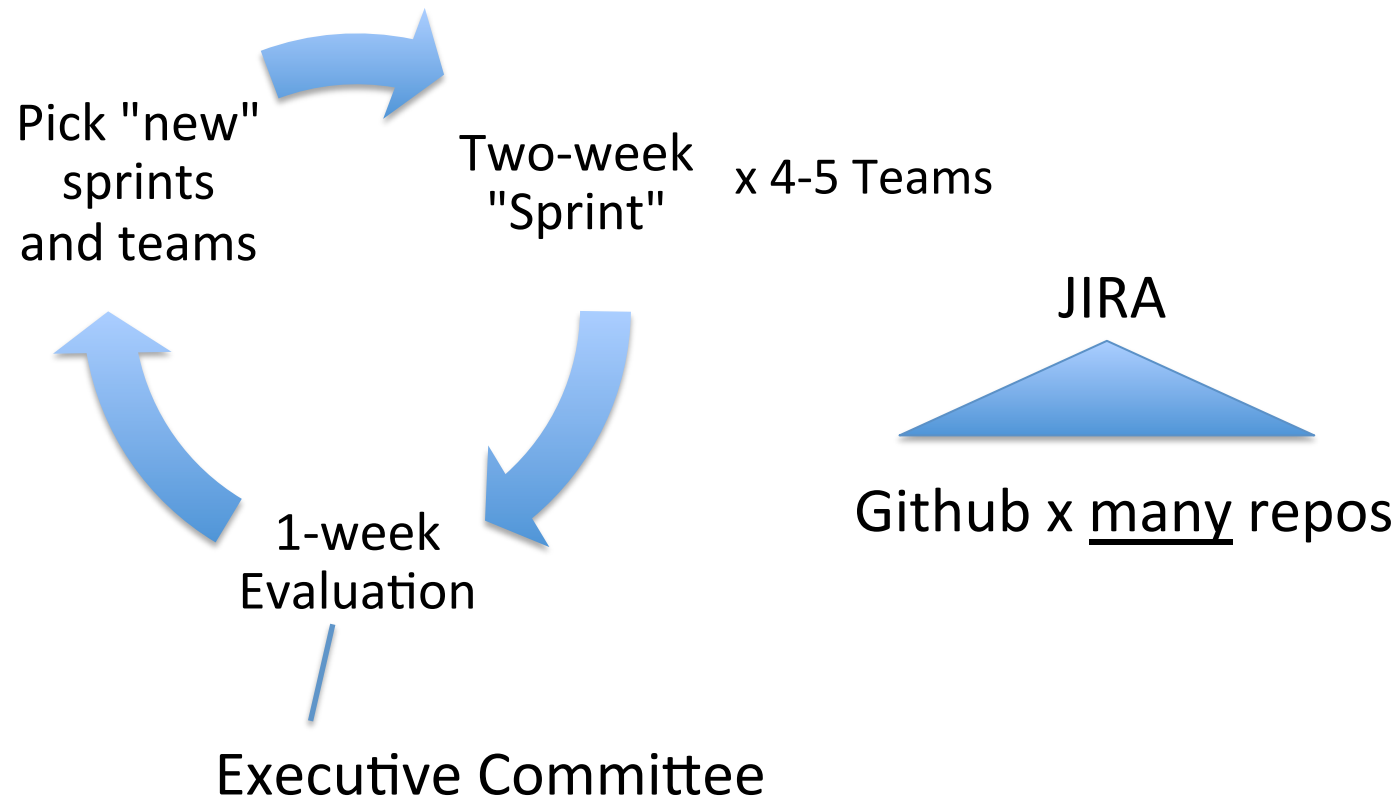
**No standards
for software
engineering**

Umm.. why think that *would* work?

- It (mostly) works for C.S. research
 - avoiding long design cycles, not standardizing **save time** for the **highly rewarded** activities like publishing, doing performance studies, graduating students. Isolation can help "protect" ideas before they are published.
- Going from research groups to a cohesive software team is a **deep** shift

What we are trying:

(1) "Agile" for large, distributed science teams



(2) Openness of process

https://github.com/kbase/project_guides

Index of documents:

- [Process guide](#)
- [Acknowledgment guidelines](#)
- [External data sources](#)
- [How to add a method](#)
- [How to add a new data type](#)
- [Developer deployment](#)
- [Setting up Travis CI and Coveralls](#)
- [ThirdPartyDevelopmentProtocol](#)
- [Towards a Social Platform](#)
- [Feature requests](#)
- [Help Desk Process](#)