

Fabbbbit

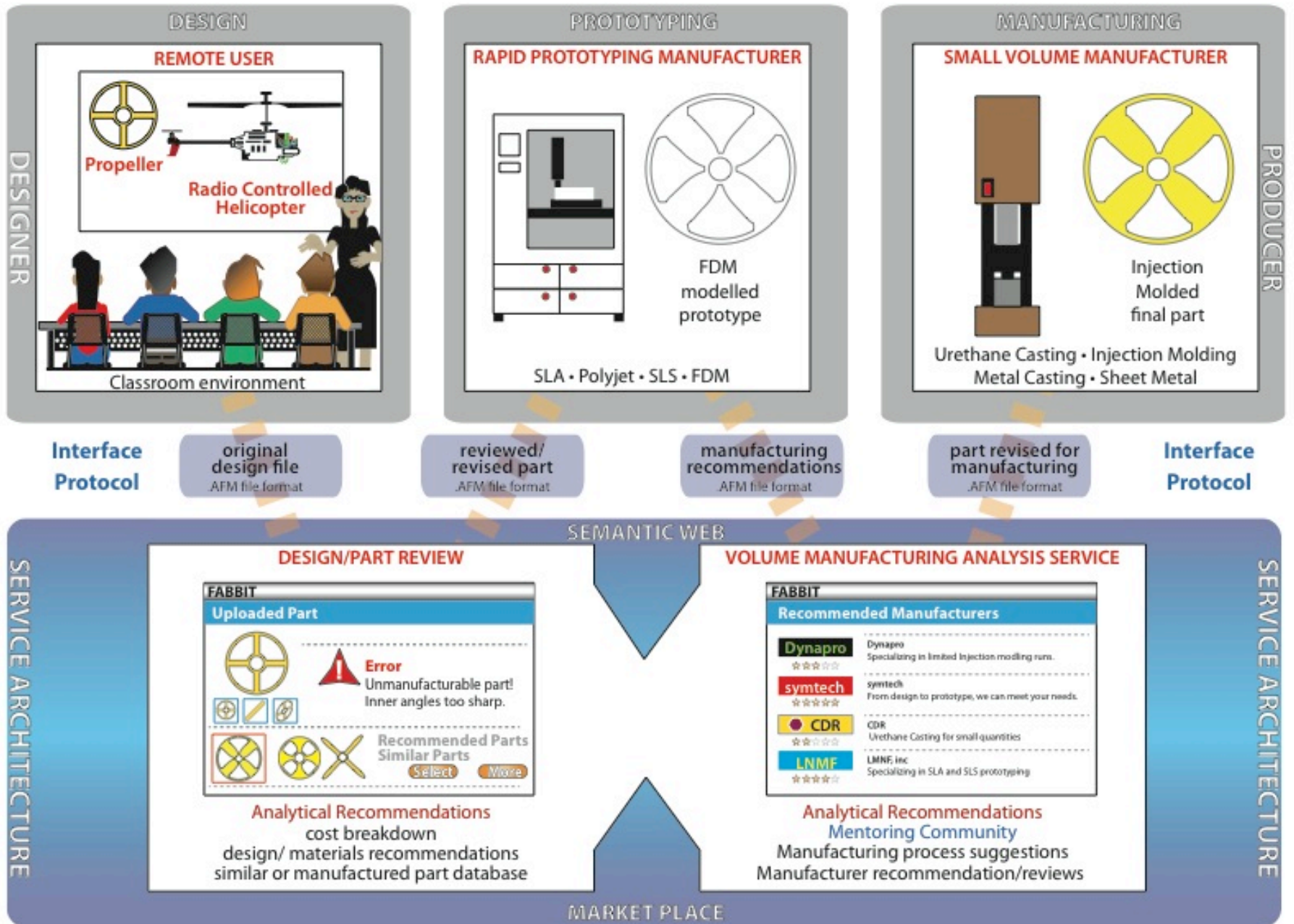
Fabrication and Brokering through Information Technology

Björn Hartmann (EECS)

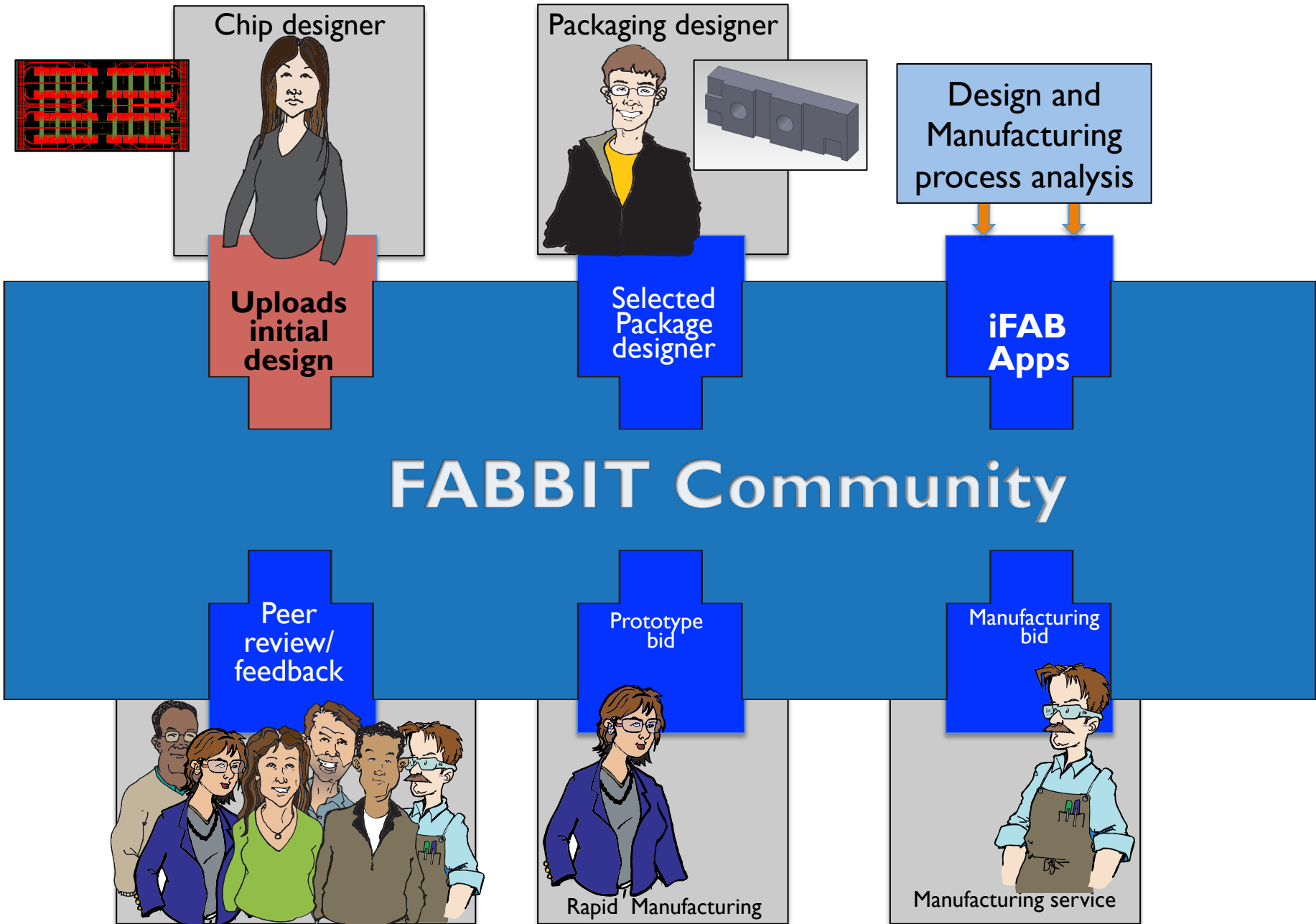
Paul Wright (ME)

UC Berkeley

NSF CMMI 2012



A “Social Network for Manufacturing”?



Fabbit Principles

- Design is an **iterative process** - designers end up with many file versions and alternatives
- *Therefore:* Use **revision control** tools to keep track of versions
- Design advances through **feedback** – from experts and through automatic tools
- *Therefore:* Offer social **review** and **Q&A** tools

Inspiration: Social Coding Sites

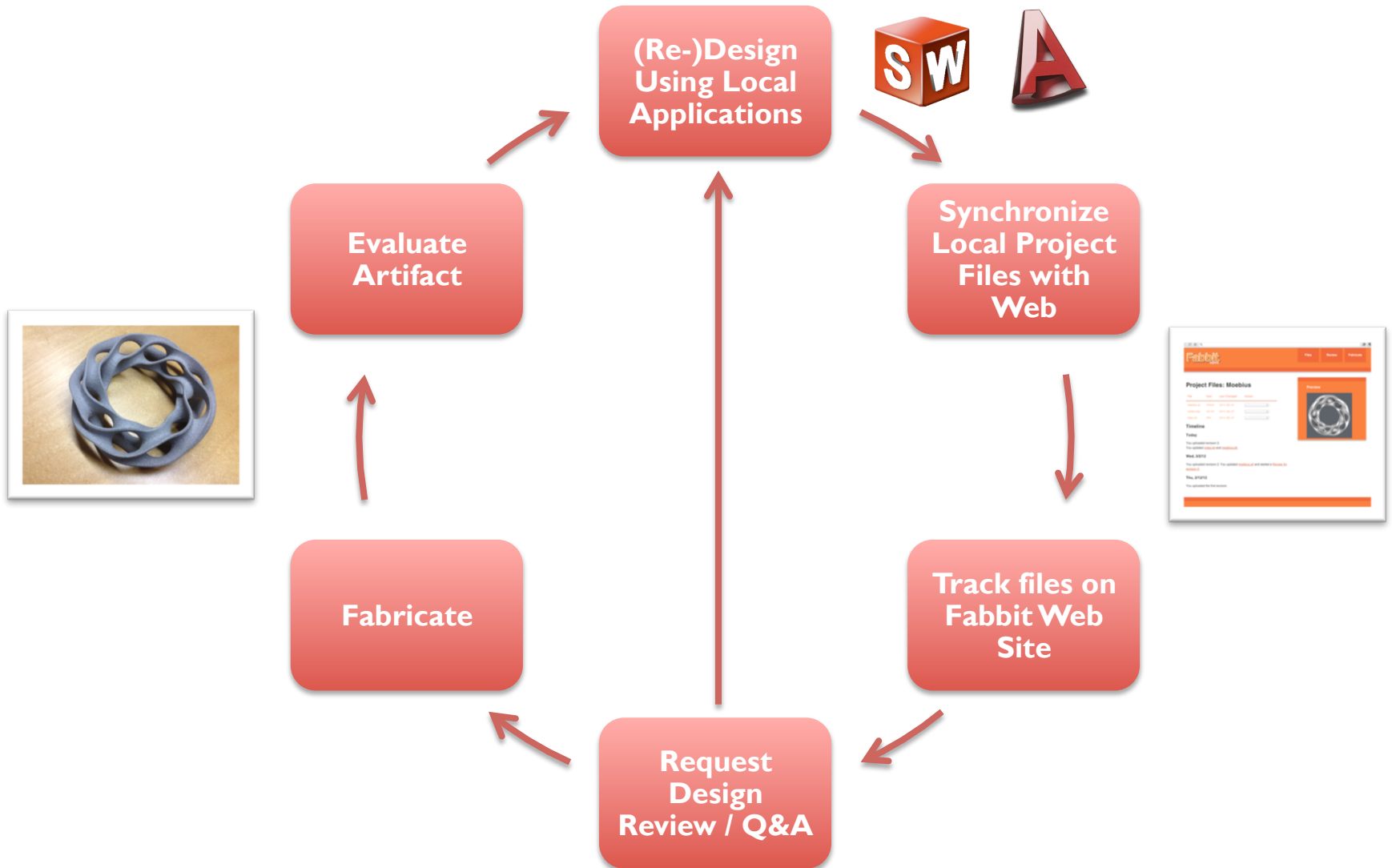


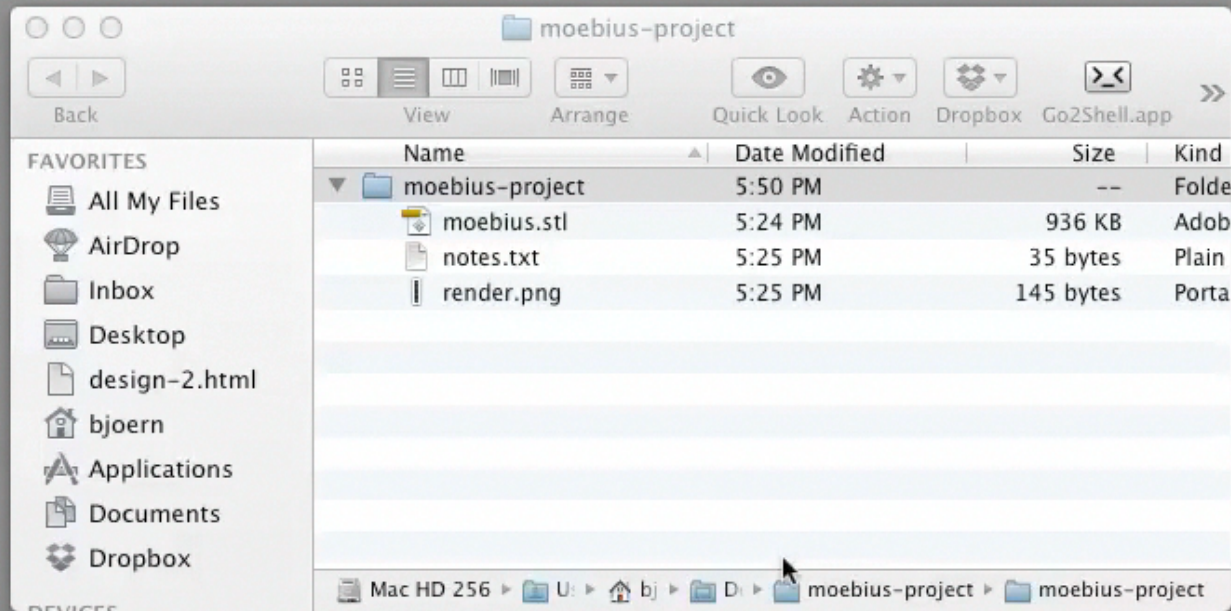
>1M users, >2M repositories
raised \$100M venture funding yesterday



- Developers use **local tools** to create software
- **Revision control** software synchronizes files with Web
- Web interfaces offer **domain-specific social network** features:
 - Team coordination
 - Issue tracking
 - Following, cloning
 - Documentation hosting

Fabbit Alpha: Focus on Iterative Design Cycle





Project Files: Moebius

File	Size	Last Changed	Action
moebius.stl	45934	2012-06-24	<input type="button" value="⌵"/>
render.png	45145	2012-06-25	<input type="button" value="⌵"/>
notes.txt	495	2012-06-24	<input type="button" value="⌵"/>

Timeline

Today

You uploaded revision 3.

You updated [notes.txt](#) and [moebius.stl](#).

Wed, 3/2/12

You uploaded revision 2. You updated [moebius.stl](#) and started a [Review for revision 2](#).

Thu, 2/12/12

You uploaded the first revision.

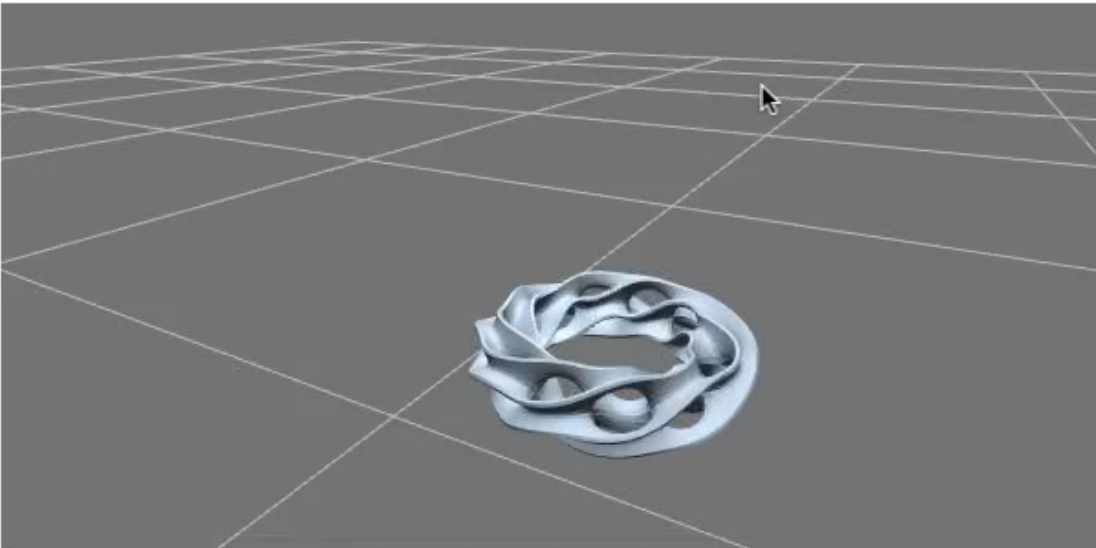
Preview





- Files
- Review
- Fabricate

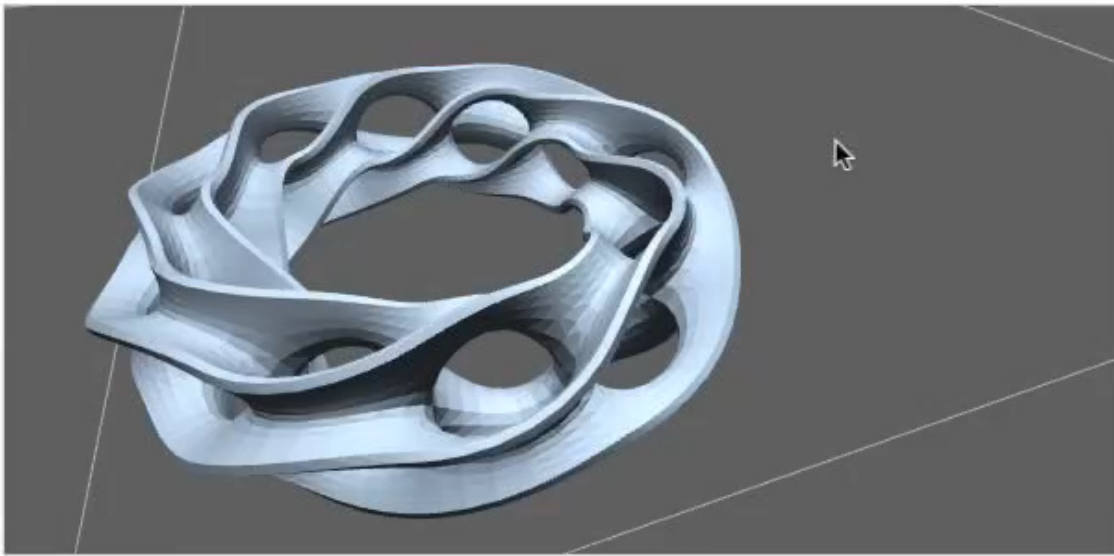
File Review: moebius.stl, Version 3



Rotate Stop + -

What questions do you have about this file?

I'd like to set up a mold to cast this model in bronze. How should I go about this?



Add Note

Rotate Stop + -

Question:

Is there a regular expression to detect a valid regular expression?

▲
45

Is it possible to detect a valid regular expression with another regular expression? If so please give example code below.

▼
regex

☆
21

[link](#) | [edit](#) | [flag](#)

asked Oct 5 '08 at 17:07



psytek

258 ● 3 ● 6



stackoverflow

8 Minutes Later:

Is there a regular expression to detect a valid regular expression?

▲
45
▼

Is it possible to detect a valid regular expression with another regular expression? If so please give example code below.

regex

☆
21

[link](#) | [edit](#) | [flag](#)

asked Oct 5 '08 at 17:07



psytek

258 ● 3 ● 6

▼ 1

answered Oct 5 '08 at 17:15



MizardX

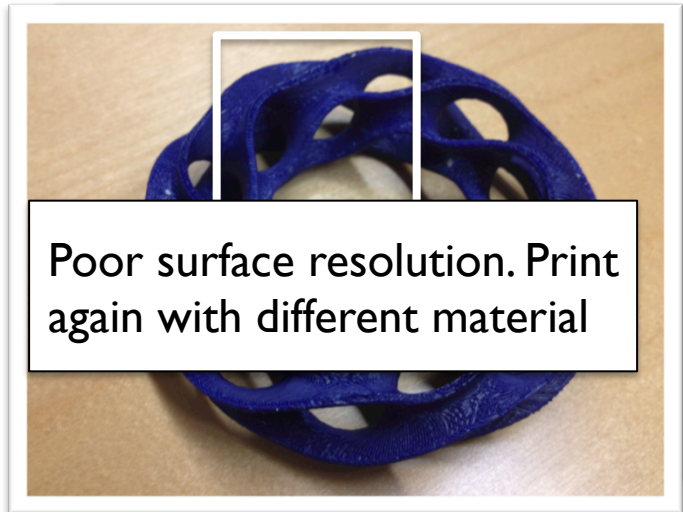
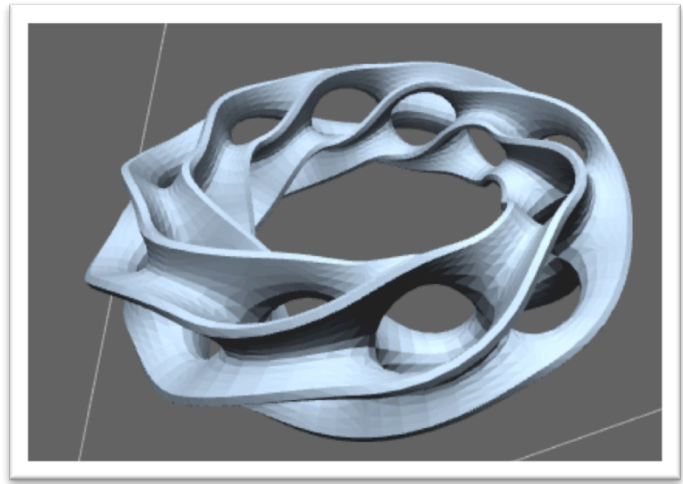
9,249 ● 17 ● 31

```
/(?:[^\?+*{}()[\]\\\]+|\\.|\\[(?:[^\]\\\]+|\\.)*\\]|\\((?:\\?\\?[:=!]|\\?<[=!]|\\?>)?(?:R)\\))(?:[:(?:[
```

This is a recursive regex, and is not supported by many regex engines. PCRE based ones should support it.

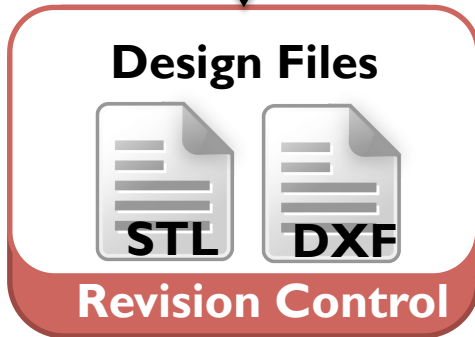
Plug-in services

- Once versioned files are online, many services can consume them:
 - Q&A
 - Automated design rule checkers
 - Crowdsourced CAD editing (oDesk)
 - Fabrication as a service (Shapeways, Ponoko)
- Today's web architecture (REST APIs) are a good starting point. Use them.



Fabbit Web Architecture

User (Designer)

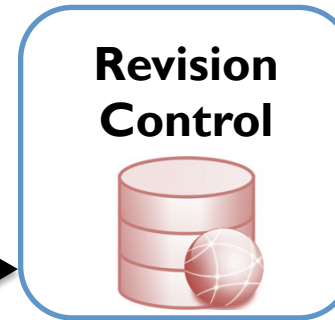


file updates



web application
over HTTP

Fabbit Server



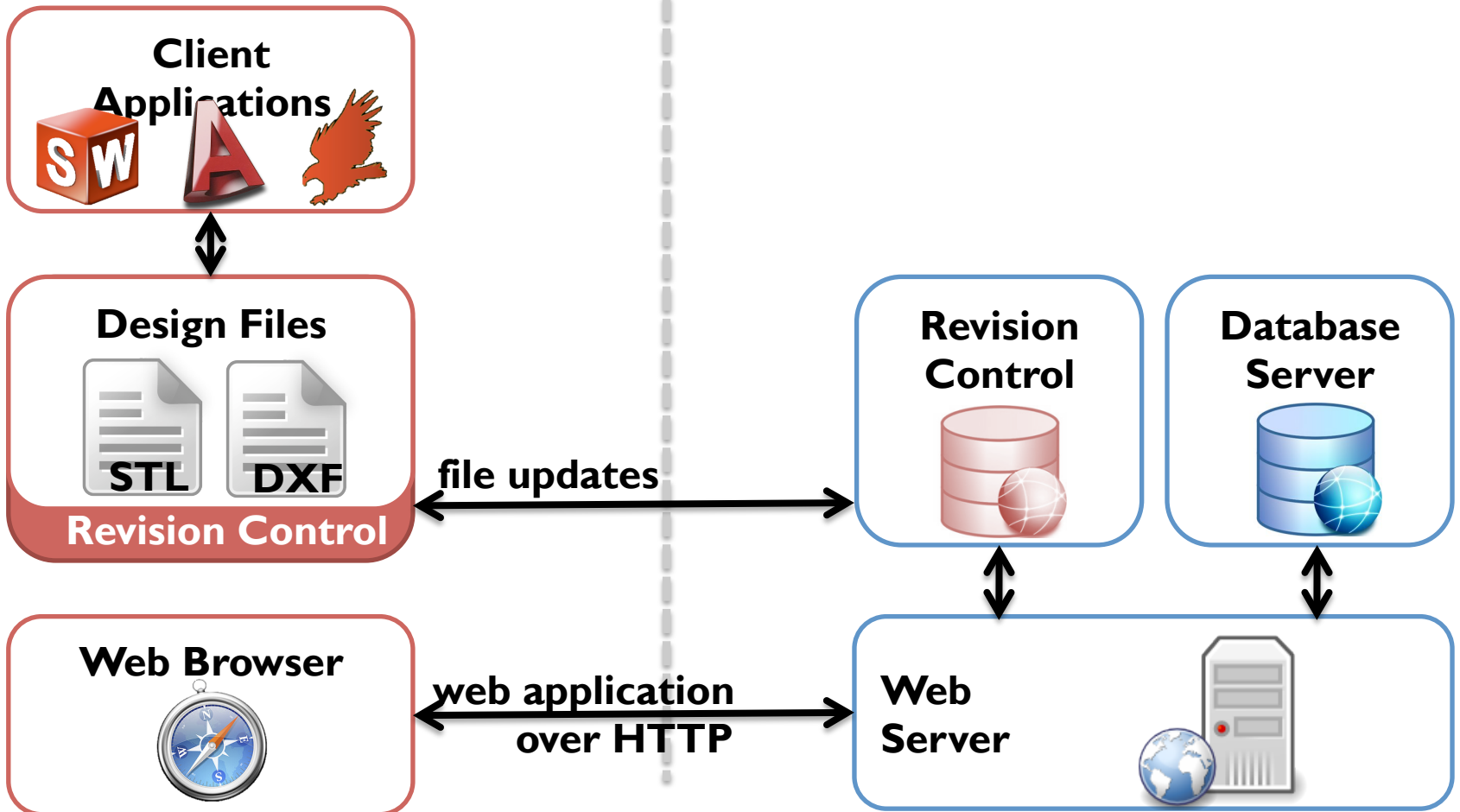
XML



Fabbit Web Architecture

User (Designer)

Fabbit Server



Implementation

- Web Server: node.js, socket.io, express.js
- Revision Control Integration:
modular, currently using subversion
- In-browser 3D model viewing using WebGL

First Fabbit Deployment

- **Interactive Device Design** course, Fall 2012
- Course goal: teach the design, prototyping, and fabrication of physical objects that respond interactively to user input
- 25 students from Mechanical Engineering, Computer Science, School of Information
- Taught in new CITRIS invention lab.

Example “Interactive Devices”



Topobo (Raffle, Parkes – MIT Media Lab)



Sifteo Cubes

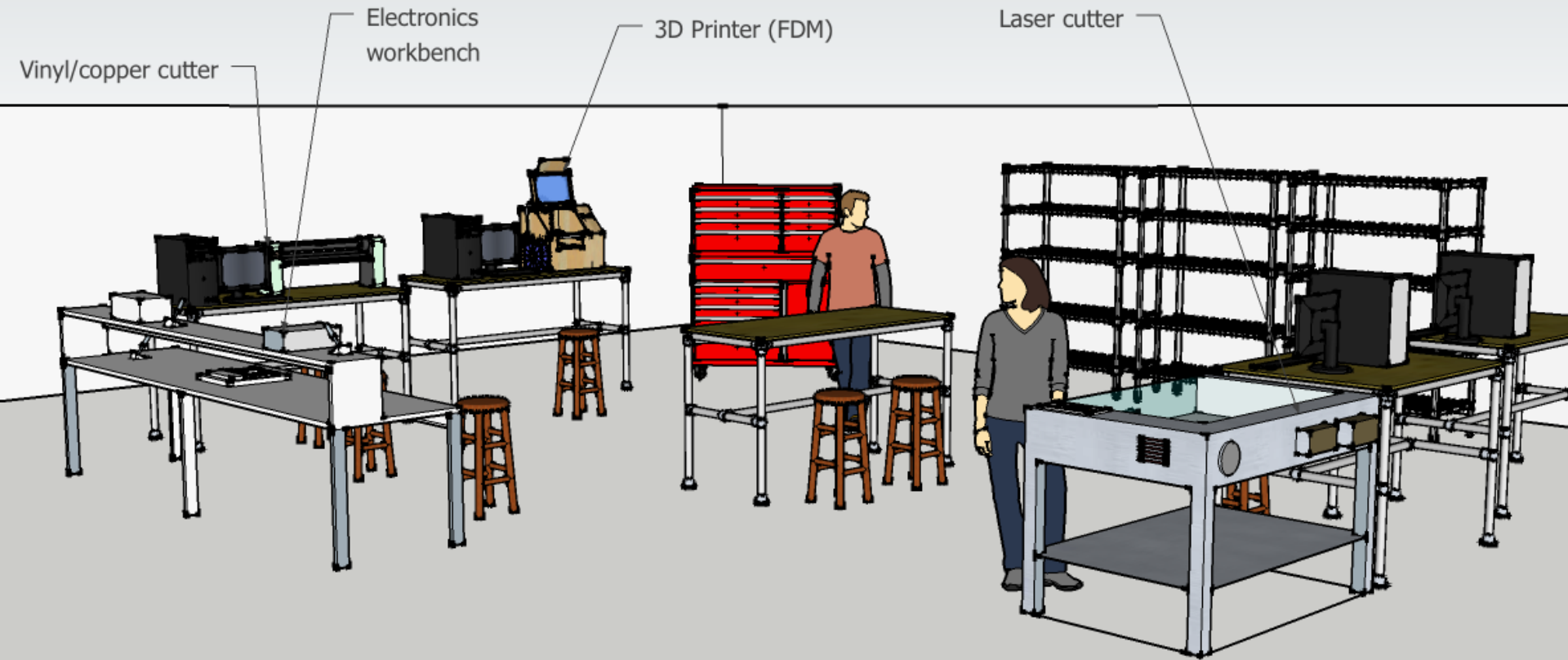


FitBit



PedalBrain

CITRIS Invention Lab



Fabbbbit

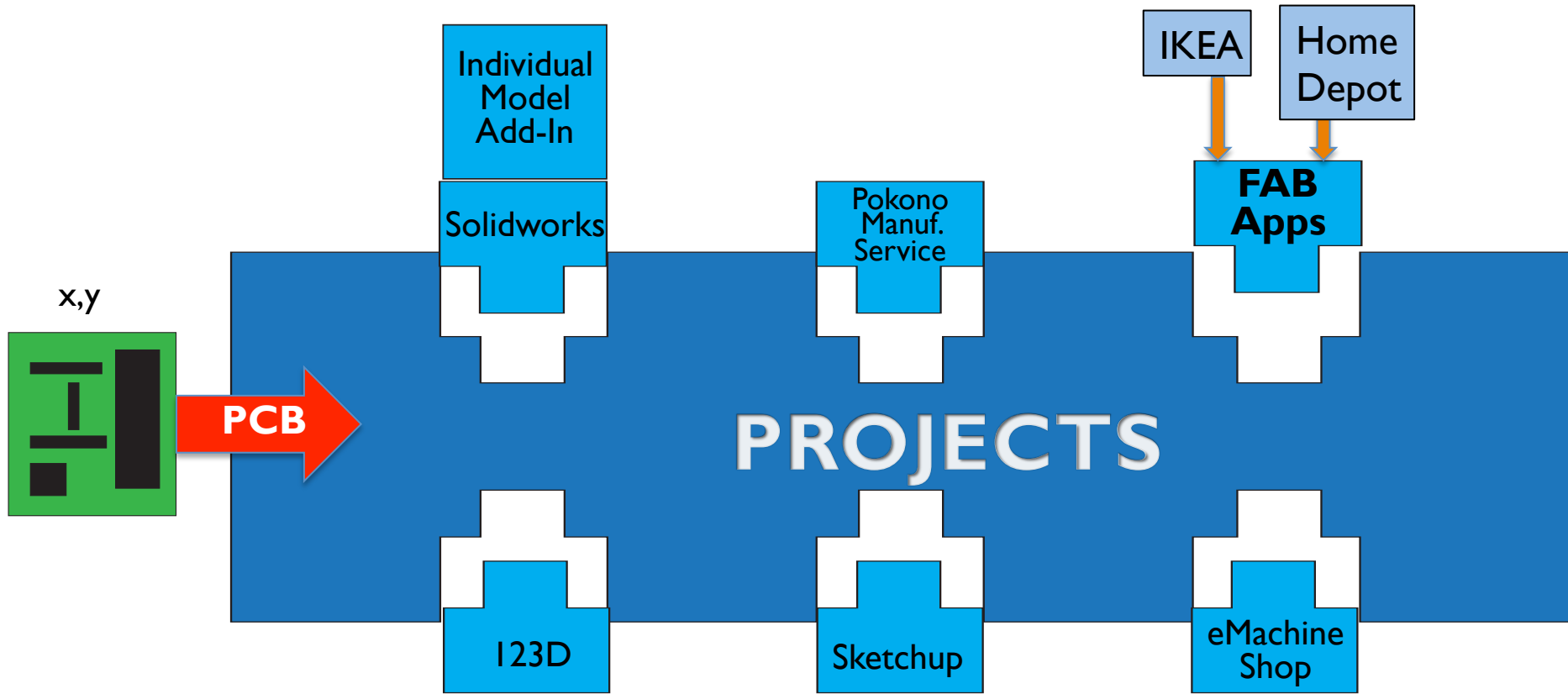
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