The Commons Initiative
at San Francisco State University

http://commons.sfsu.edu

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Presented at:
Computer and Information Sciences
University of Hyderabad, India

SF STATE

SF State University (1899 - present)

- 29,000 + students

- Colleges: Business, Creative Arts, Education, Ethnic Studies, Health and Human Services, Humanities, Science and Engineering

- Campus:
    - Main Campus: 1600 Holloway Ave. San Francisco
    - Downtown Center: 835 Market St., San Francisco
    - Romberg Tiburon Center, Tiburon

http://www.sfsu.edu

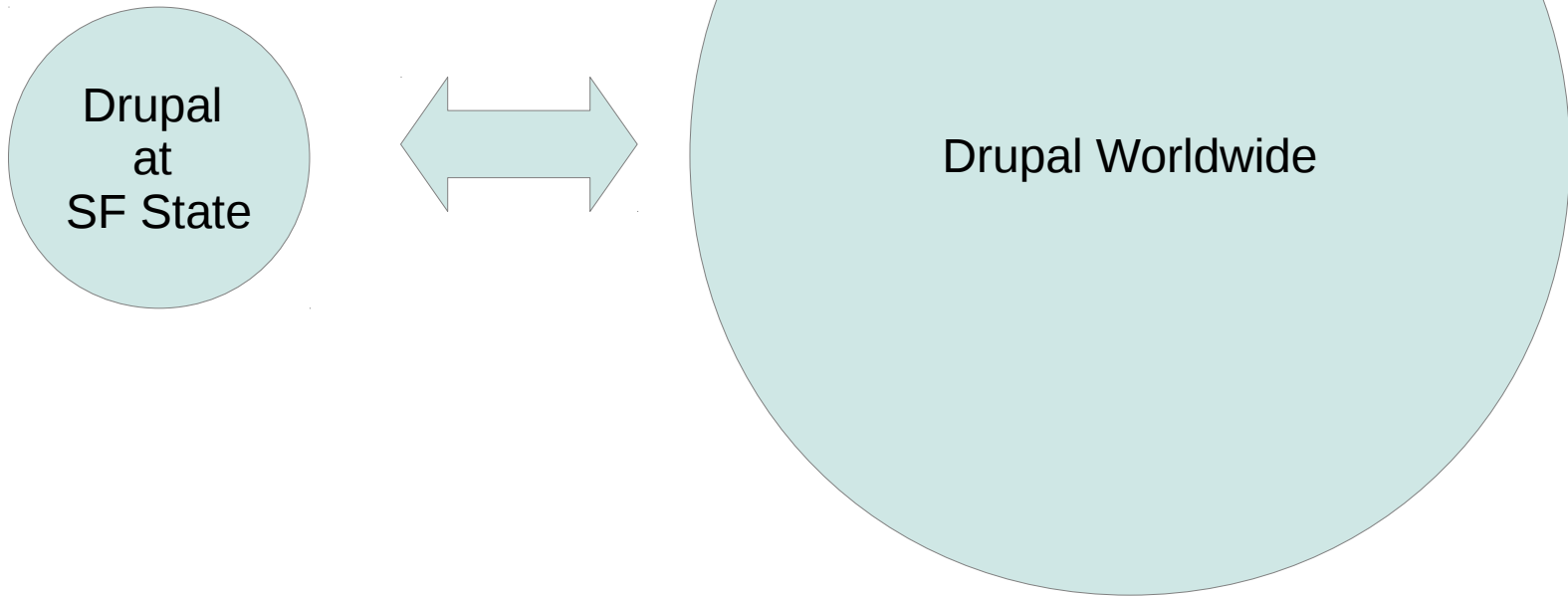# Commons Initiative - Mission

- Two-fold:
  - To connect people, so they can communicate their ideas, and collaborate on projects in the digital commons space at SF State. (inward)

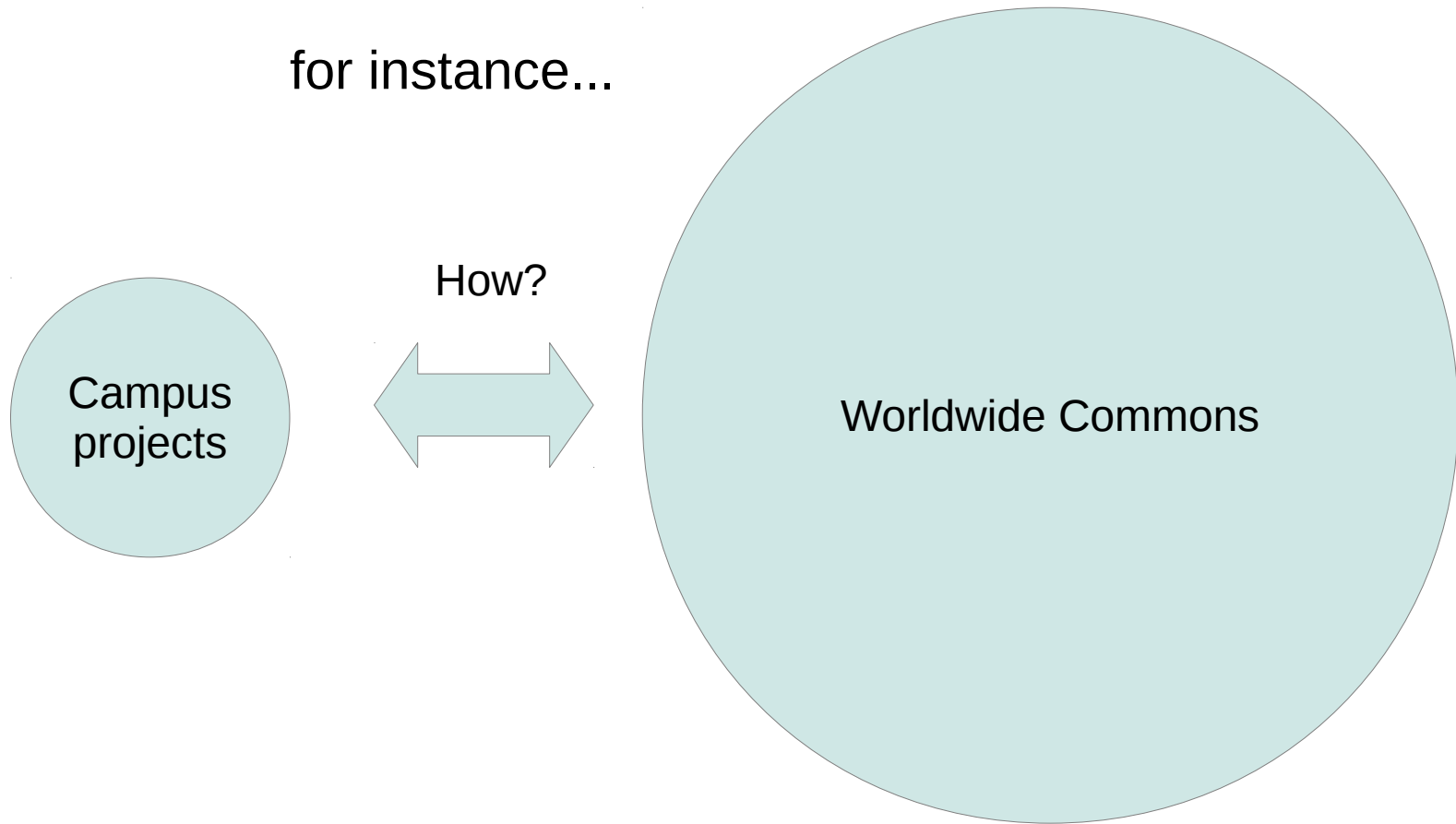 - To foster an environment where SF State commons can participate in the commons worldwide. (outward)

http://commons.sfsu.edu

SF STATE

Two-fold mission

for instance...

Drupal
at
SF State

Drupal Worldwide

SF STATE

Upstream - Downstream

for instance...

How?

Campus projects

Worldwide Commons

SF STATE

Not a committee

A community initiative.

Open to all:

Students, Staff, Faculty

Lenses

- Education
  - How to bring "commons" into the classroom.

- Technology
  - Neat stuff happens on campus. Share!

- Outreach
  - Sustained collaboration and participation.

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Advisory Board

Upstream connections

Alexis Rossi, Internet Archive

Alexis Rossi

Alexis is on her second tour of duty at the Internet Archive, working on a program to archive the entire Internet and thinking about questions like "what does 'the entire Internet' mean?" and "do we really want it ALL?" Alexis currently manages all aspects of Internet Archive collections work for every type of media, and runs the Wayback Machine project. From 2006-2008, Alexis managed the audio and video collections and Open Library, as well as working on the Open Content Alliance, and the Zotero/IA project.

Alexis has been working with Internet content since 1996 when she discovered that being picky about words in books was good training for being picky about data on computers. She spent several years managing news content at ClariNet (the first online news aggregator), worked as the Editorial Director at Alexa Internet, and as Product Manager at Mixercast. Alexis has an MLIS, concentrating on web technologies and interfaces, and enjoys making jewelry, dancing, costuming, and baking Cookie Smackdown-winning cookies.

Email: alexis@archive.org

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Alolita Sharma, Wikimedia

Alolita Sharma

Director, Features Engineering at Wikimedia Foundation
Director, Treasurer at Open Source Initiative (OSI)

20 years of industry experience in managing and developing software solutions for web, telecommunications, banking and government markets leveraging web and open source technologies. As an open source strategist, collaborated with leaders in India and Asia to create sustainable ICT policies and best practices.

Specialties

- Strategies and best practices for leveraging open source.
- Engineering management.
- Software development using collaborative tools and techniques.
- Building communities around open source.
- International community development and outreach.
- Deep understanding of open source ecosystems in India and Asia.

Email: alolita.sharma@gmail.com

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Asheesh Laroia, Openhatch

Asheesh Laroia

Asheesh loves growing camaraderie among geeks. In the past, he has chaired the Johns Hopkins Association for Computing Machinery and taught Python classes at Noisebridge, San Francisco's hackerspace. He realizes that most of the work that makes collaborative projects successful is hidden beneath the surface.

He has volunteered his technical skills for the UN in Uganda, the EFF, and Students for Free Culture, and is a Developer in Debian. He has worked at Creative Commons and the Participatory Culture Foundation as a software engineer, designing and scaling web systems. Today, he lives in San Francisco, CA, working on OpenHatch.org.

Email: asheesh@asheesh.org
Web: http://asheesh.org/

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Brian Behlendorf, Apache

Brian Behlendorf

Managing Director, Chief Technology Officer, World Economic Forum

Studies at University of California, Berkeley. 1993-98, Chief Engineer, Wired Magazine and HotWired; 1998-2003, Co-Founder and Chief Technology Officer, Organic Online; 1997-2007, co-founded and Director, Apache Software Foundation, a non-profit creating free, open source software for building Web; 1999, founded CollabNet, to bring open source development tools and methodologies to organizations; with Open Government Initiative, Obama Administration; 2009-10, with US Department of Health and Human Services, led implementation of open source platform and standards for exchange of electronic healthcare records.

Expertise: finding great Asian food in Geneva. Interests: music, travel, iconoclasm.

Email: brian@behlendorf.com
Web: http://brian.behlendorf.com/

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Stefano Maffulli, Openstack

Stefano Maffulli

OpenStack community manager, Stefano built his career around Free Software and open source. As Italian Chancellor of the Free Software Foundation Europe, he also created the FSFE Fellowship participation program. Later as community manager of leading mobile open source sync solution Funambol, his efforts boosted downloads and bolstered enterprise contributions. For Twitter, he led efforts to expand in the Italian market. In his spare time, he builds furniture and is learning how to sail in the San Francisco Bay.

Email: stefano@maffulli.net
Web: http://maffulli.net

Tim Vollmer, Creative Commons

Timothy Vollmer

Timothy Vollmer is Policy Coordinator for Creative Commons, and has worked as a policy fellow, business development assistant, and intern for Creative Commons. Prior to rejoining CC, Timothy was Assistant Director to the Program on Public Access to Information for the American Library Association Office for Information Technology Policy in Washington, D.C. Timothy is a graduate of the University of Michigan School of Information, with a specialization in information policy. While at Michigan, he was a research investigator for the Open.Michigan Open Educational Resource initiative, helped develop a student-centric OCW publishing pilot there.

Email: tvol@creativecommons.org

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Two example projects

3D Printing

Learning Analytics

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3D Printing

3D Printing

- Length (X), width (Y) and depth (Z)

- Icing on a cake.
  - Make a flower from butter and sugar icing.
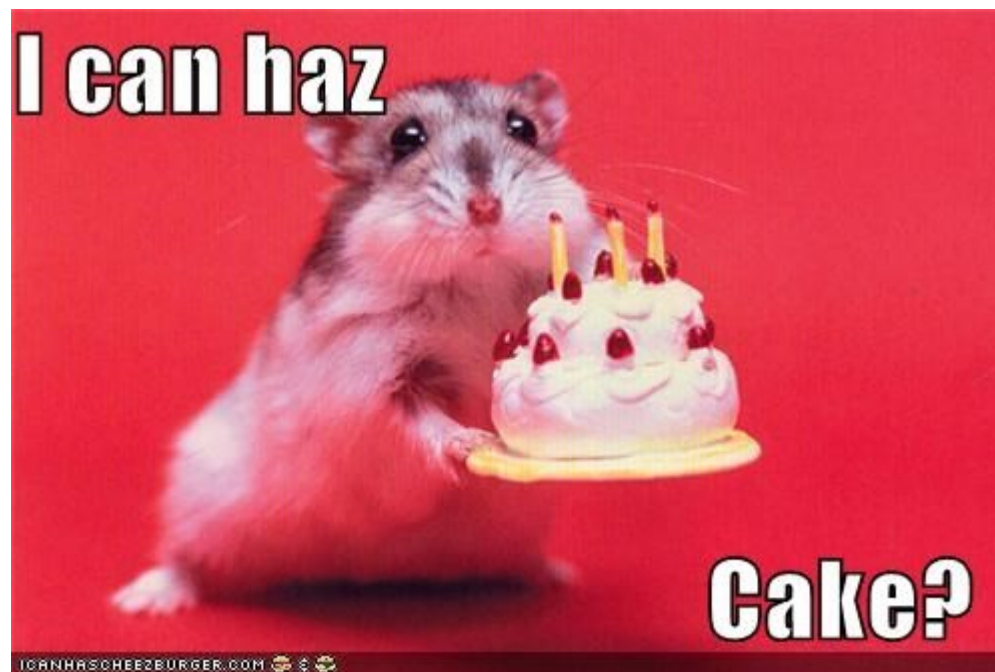
2D Printing

- Inkjet printers
  - Cartridge is X axis
  - Paper feed is Y axis
  - No depth.

http://www.computershopper.com/var/ezwebin_site/storage/images/media/images/how-it-works-inkjet-printer/221000-1-eng-US/how-it-works-inkjet-printer.jpg

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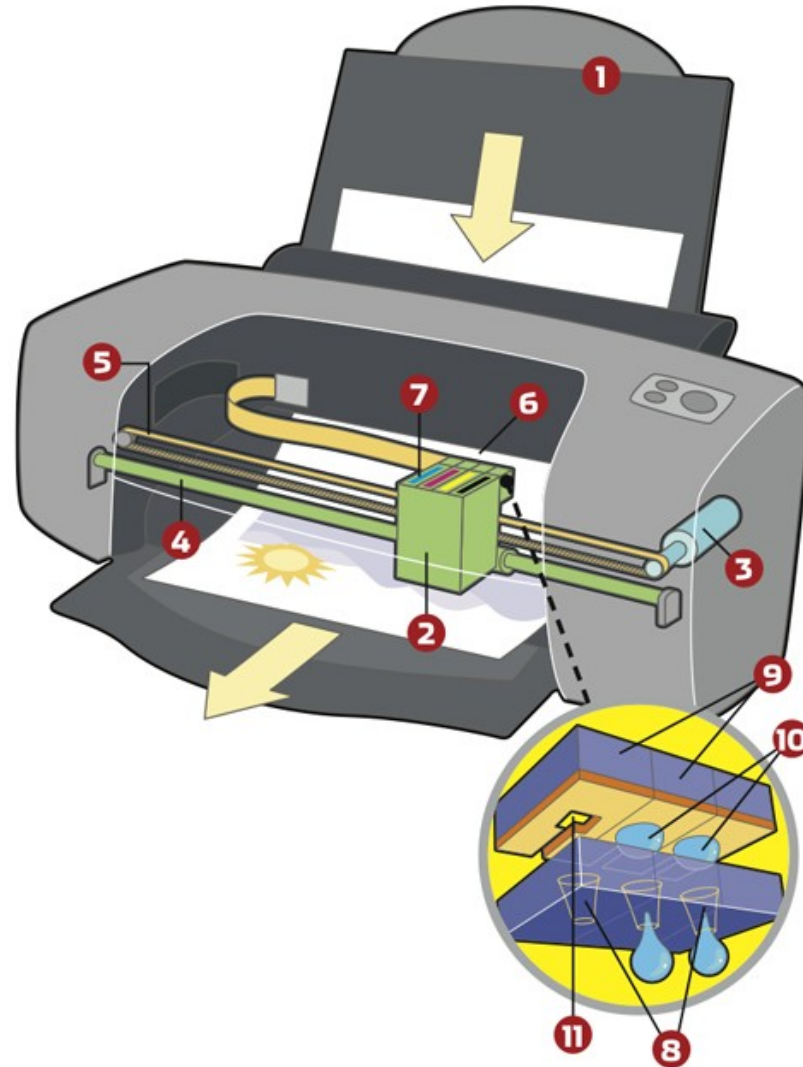
Add Z Axis

- Print using molten plastic

- Move print head up slightly

- Layer plastic

- Cooled plastic = 3D object

Industrial

- Fills up a small room

- $20,000 to $50,000

- Used for prototyping

- Don't forget the ink!

Production series from Stratasys

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Hobby Market

- Plastic (the ink) costs $30 a kilogram

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Question:

Affordability

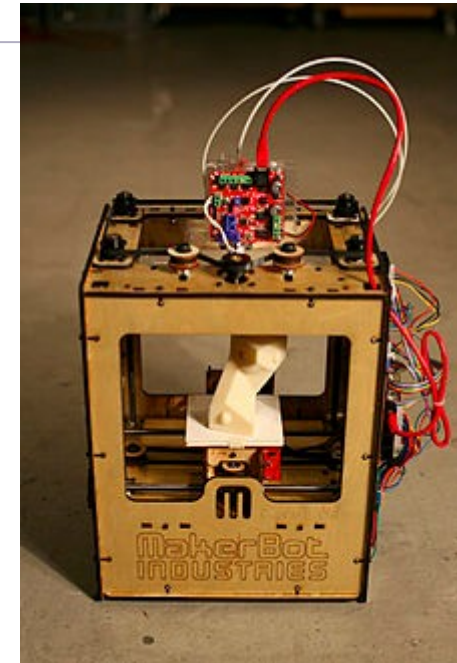How much would you pay for a 3D printer?

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RepRap

- Replicating Rapid Prototyper

- Print a printer from a printer
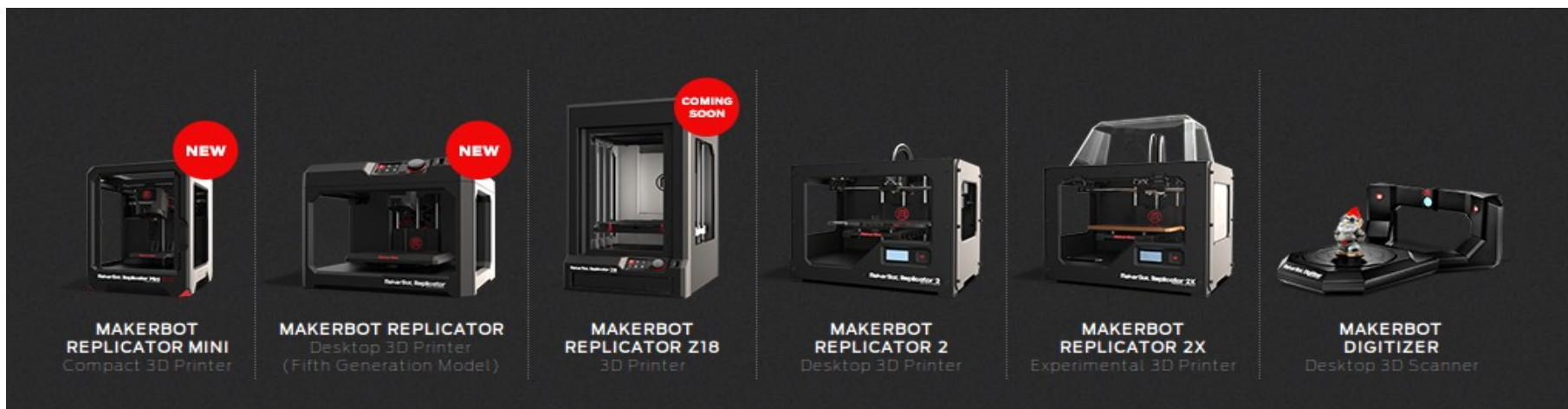 - 70% to 90%

- Self-replicating printers!

- http://reprap.org

Watch the video:

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MakerBot

- Early open source printer

- Became proprietary

- Acquired by Stratasys

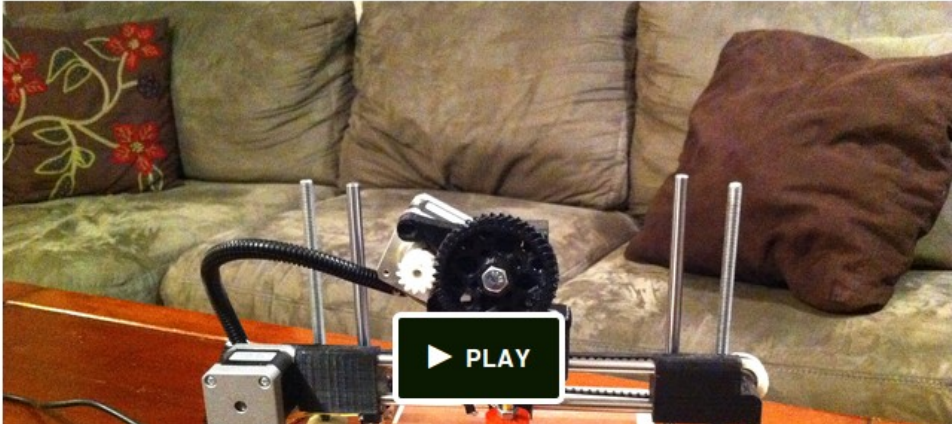- Printers range from $1200 to $7000

- http://makerbot.com

Cupcake

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Printrbot at Kickstarter

- Goal of $25,000

- Raised $830,827 on Kickstarter

Printrbot Bots

- http://printrbot.com

Assembled Printrbots

Showing all 3 results — Default sorting

Assembled Printrbot Jr. (v2)
$699.00
Add to cart

Assembled Printrbot PLUS (v2.1)
$999.00
Add to cart

Assembled Printrbot Simple
$449.00
Add to cart

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Parts

- Motors

- Bed

- Extruder

- Filament

- Threaded rods

- Smooth rods

- Pulleys

- Gears

- ...

Plastic

- ABS

- PLA

- Other

Tweaks

- Open Source => Lots of tweak'ability!

- Tweaks make it better.
  - http://printrbottalk.com
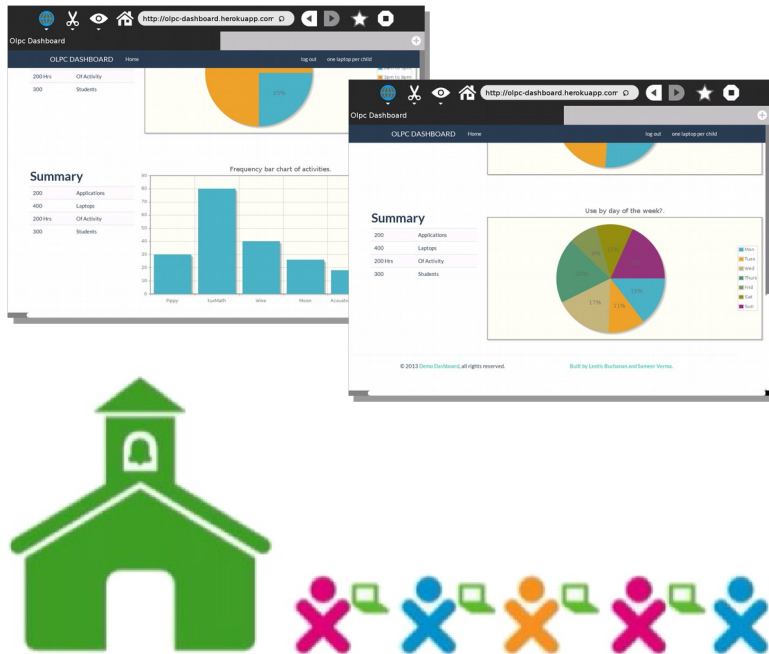 - https://www.youtube.com/user/printrbot
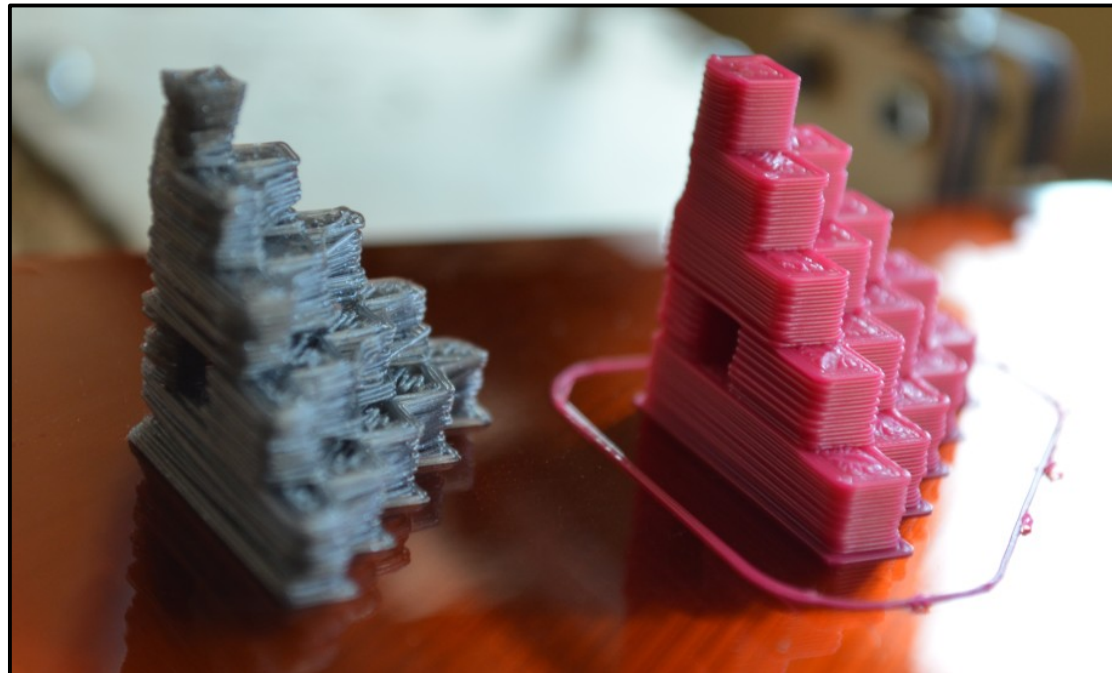
Printrbot Jr. V2
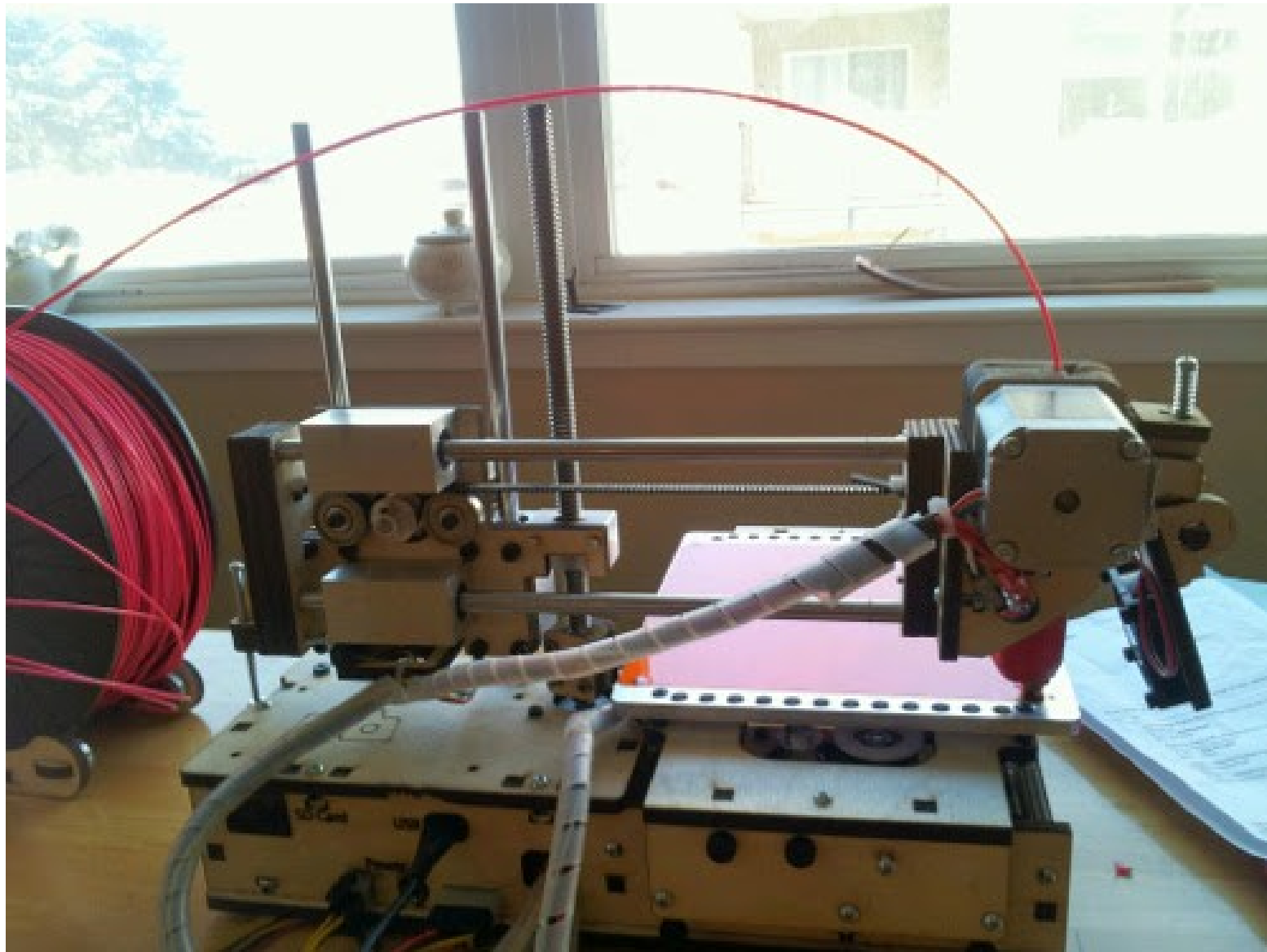
Learning Analytics

XOVis – Analytics and Visualization

Learning Analytics for Sugarlabs and OLPC

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Overview

- Peering into data about usage of laptops

- Learning Analytics
  - 1) measurement, 2) collection, 3) analysis and 4) reporting

- Visualization is part of the the reporting section
  - Tends to be most memorable, because of its visual component
  - Reporting should be more than just visualization

- XOVis as an add-on to existing and new projects
  - Existing projects can add this and "do analytics"
  - New projects can implement integrated analytics along with each school deployment.
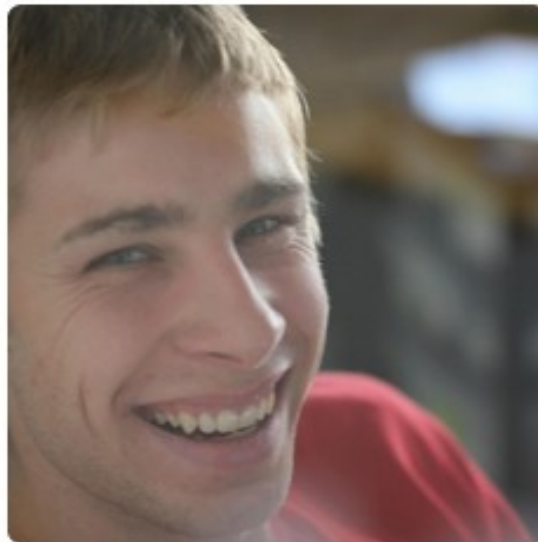
History

- Paraguay – Raúl Gutiérrez Segalés and Morgan Ames

- Jamaica – Leotis Buchanan and Sameer Verma

- Australia – Martin Abente Lahaye

- India – Anish Mangal and Sameer Verma

- Nepal – Martin Dluhos, Andi Gros, Sameer Verma

- See http://www.olpcsf.org/node/204

XOVis

Written by Martin Dluhos

https://github.com/martasd/xovis

Martin Dluhos
martasd

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Methodologies

- Qualitative
  - In-class observation
  - Interviews
    - Children, parents, siblings, teachers, principals, local community

- Quantitative
  - Assessment tests as proxy
  - Metadata

- One corroborates the other.

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Metadata

- Not a bad word.

- Metadata is data about data.
  - Data: Creative work by the child.
  - Metadata: time of creation, duration, collaboration, save-and-resume, etc.

- Metadata acts as a proxy for engagement.

- Engagement is a proxy for learning.

- Observing aggregates.

The Datastore

- User data is stored in Sugar using a datastore written in Python.

- The front-end (user interface) to the datastore is the Journal activity

- The Journal activity allows for storage, retrieval, searching, indexing, sorting etc. as contained in the datastore.

- In addition to the Journal as an expression of the datastore, we can extract relevant bits about the data stored as metadata.

Metadata: The data about data

H	I	J	K	L	
share-scope	keep	icon-color	activity	title	machin
no-data	no-data	"#b20008,#f8e800"	""	"Photo by XO-PROV▶	SHC03
"private"	"0"	"#B20008,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
"private"	"0"	"#B20008,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		8C,#00A0FP▶	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#F8E800"	"org.laptop.RecordActivity"	"q1eezZZZazzx x x▶	SHC03
		08,#F8E800"	"vu.lux.olpc.Speak"	"sdggasq12345677"	SHC03
		08,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#f8e800"	""	"Audio by XO-PROV▶	SHC03
		2FF,#9A5200▶	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		08,#F8E800"	"org.ceibaljam.Tuxmath"	"Tuxmath Activity"	SHC03
		334,#00A0FP▶	"vu.lux.olpc.Maze"	"Maze Activitydfjrtyu▶	SHC03
		08,#f8e800"	""	"Audio by XO-PROV▶	SHC03
		08,#F8E800"	""	"Windows BMP imag▶	SHC03
		08,#F8E800"	"org.laptop.WikipediaActivity"	"encyclopaedia"	SHC03
		08 #f8e800"	""	"Photo by XO-PROV▶	SHC03

```python
#write header row
writer.writerow([
        "idx",
        "act",
        "icon_color",
        "activity_id",
        "keep",
        "mime_type",
        "mtime",
        "preview",
        "share_scope",
        "timestamp",
        "title",
        "title_set_by_user",
        "uid"])
```

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XOVis:
Cloud-based analytics and visualization dashboard

Cloud

What happens at school?
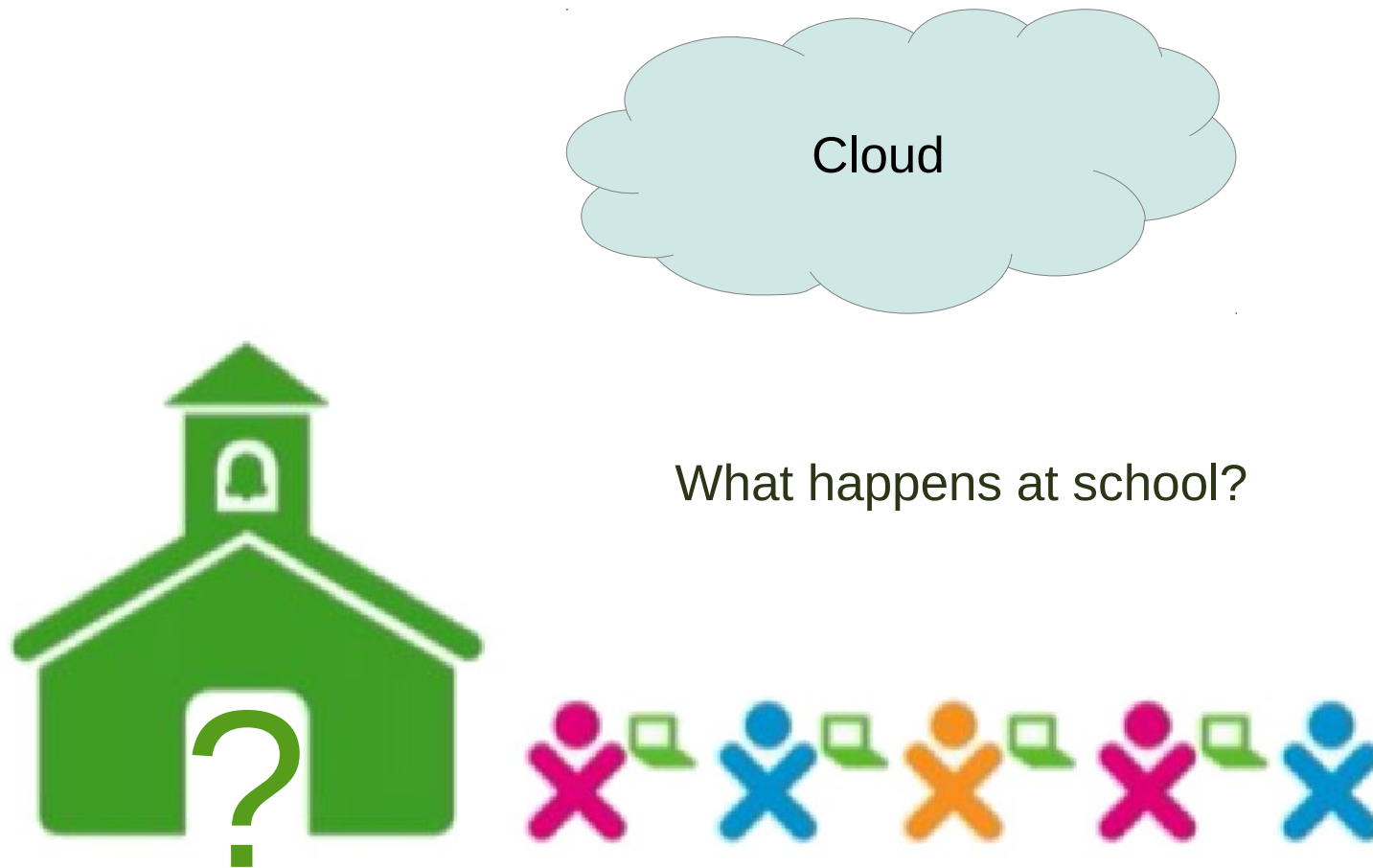
Architecture

Central management for orchestration, monitoring and analytics is done in the cloud.
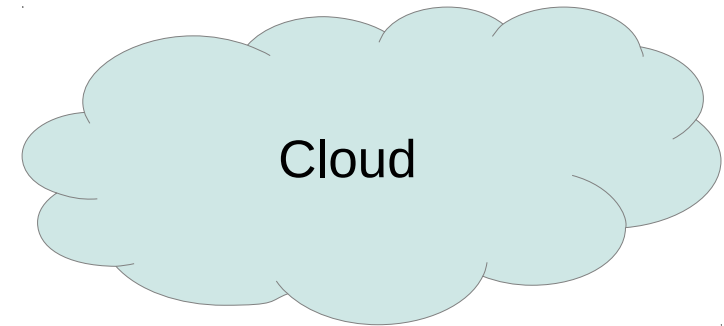
Cloud

Micro-Cloud

Micro-cloud appliance at school acts as a local mirror for content and management
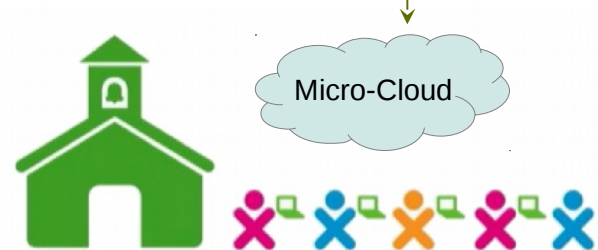
Laptop with child has some offline content. It works in school and can go home.

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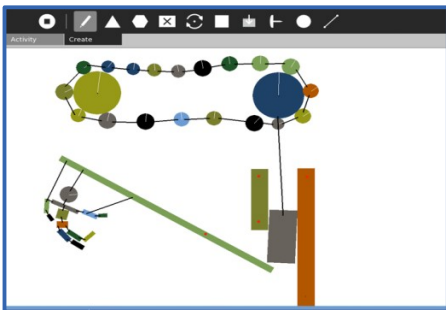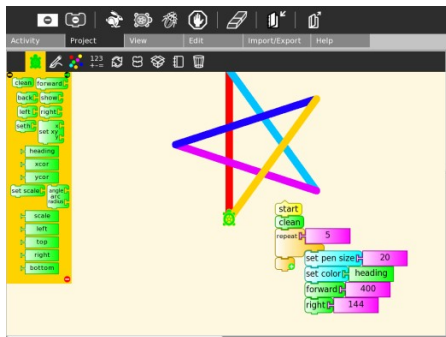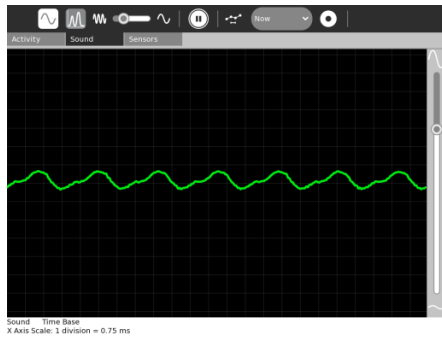
Each child's work is automatically stored in a Journal on her laptop

SF STATE
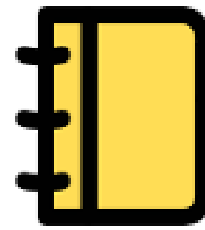
Metrics

This work is distilled into metrics at the school micro-cloud appliance

Micro-Cloud

Frequency of Use

- Tuxmath
- Photos
- Maze Activity
- Web Activity
- Videos
- Speak Activity
- Physics Activity
- TamTam Activity
- Record Activity
- Pippy Activity

SF STATE
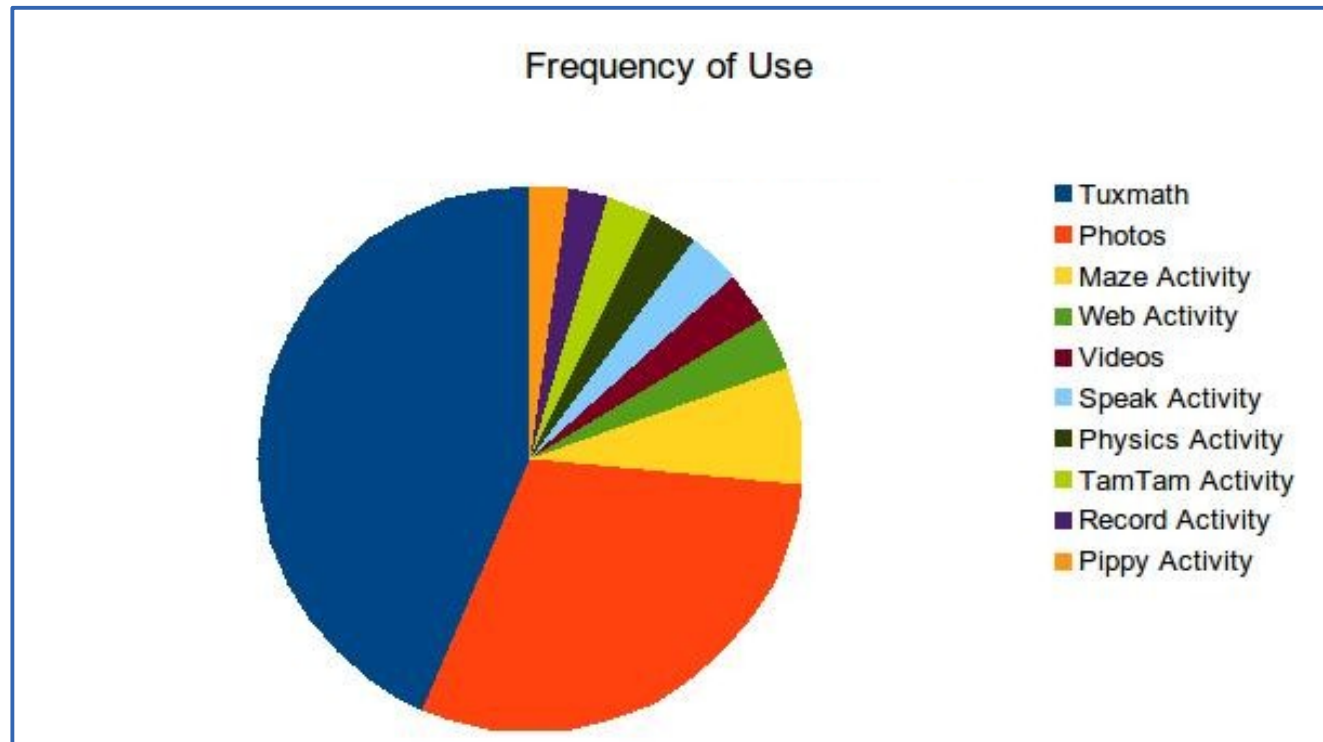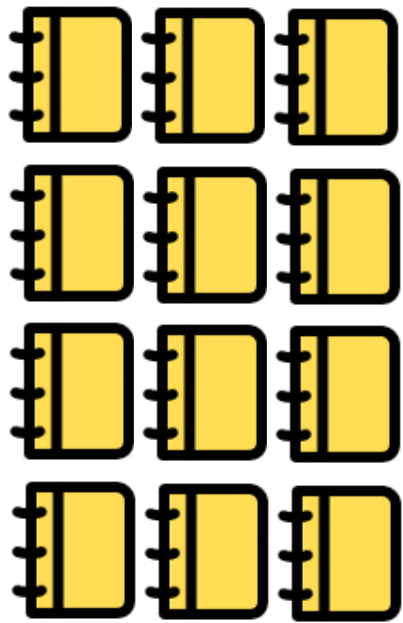
Analytics

Metrics from school appliances are synced with the cloud to generate analytics
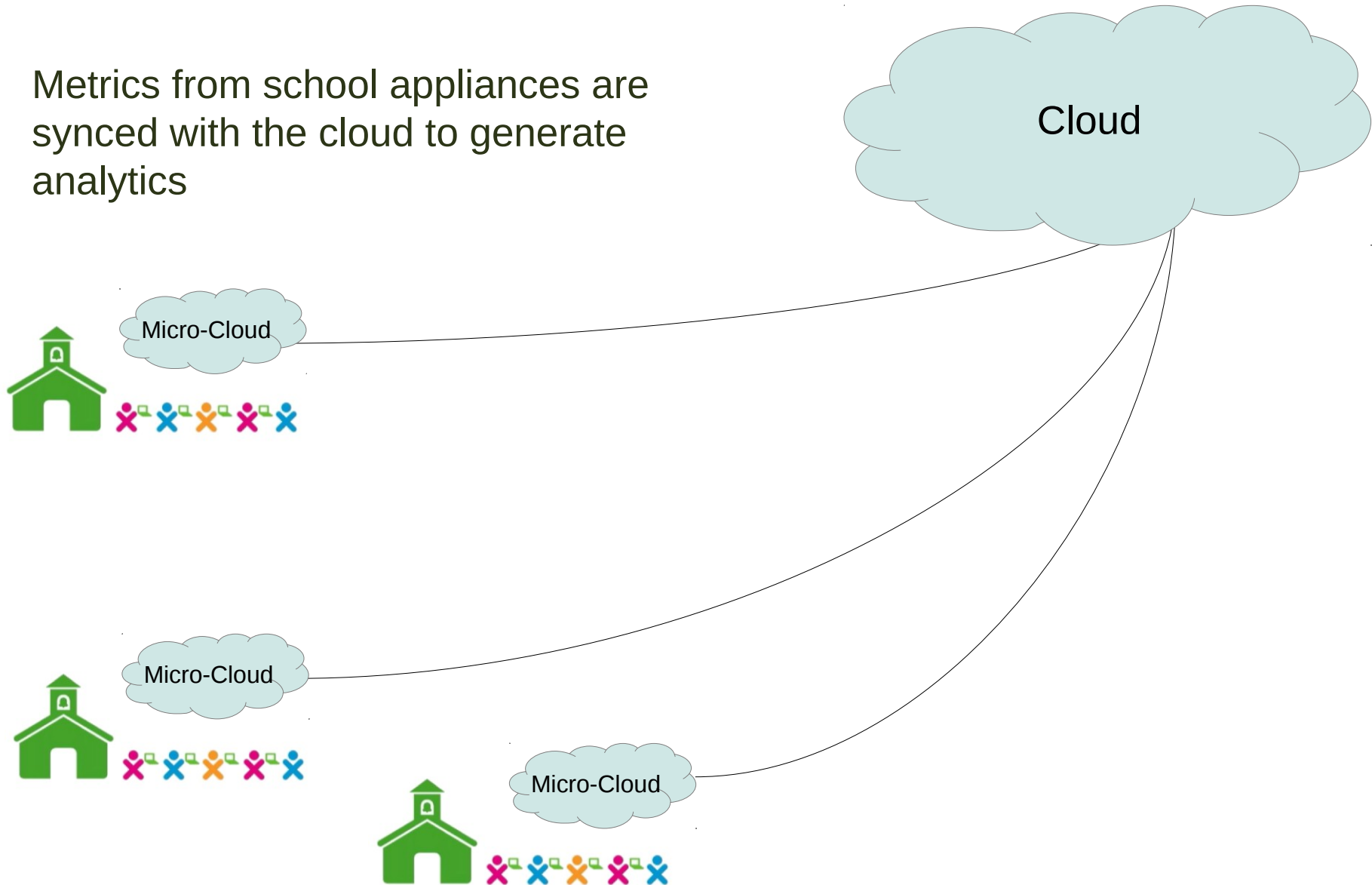
Resilience

What happens when the Internet connection breaks or slows down?

Cloud

Micro-Cloud

Micro-Cloud

Micro-Cloud

SF STATE
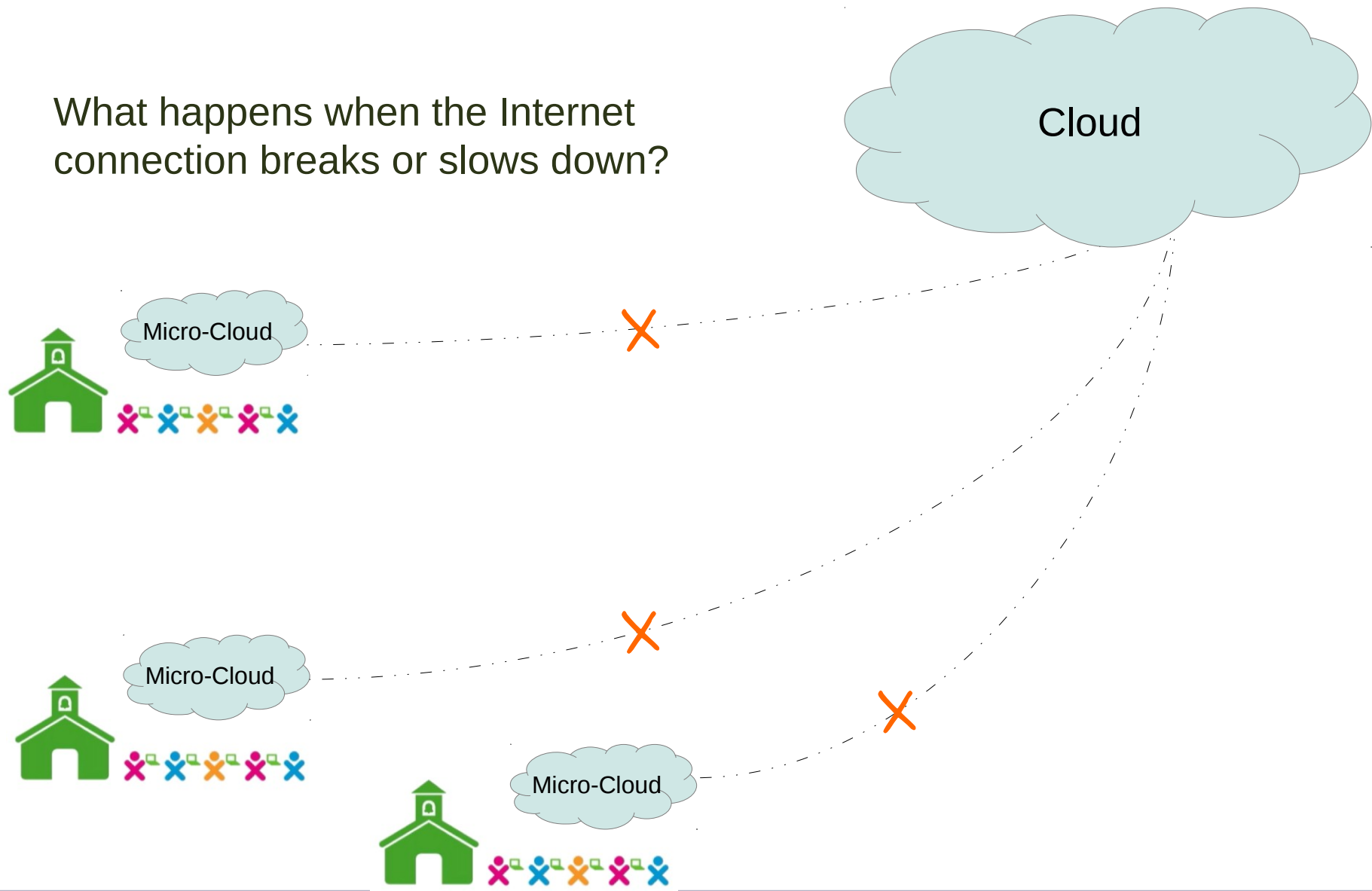
Eventual Consistency

We use "eventual consistency" to synchronize data between each school and the cloud.

Cloud

Micro-Cloud

Micro-Cloud

Micro-Cloud

SF STATE
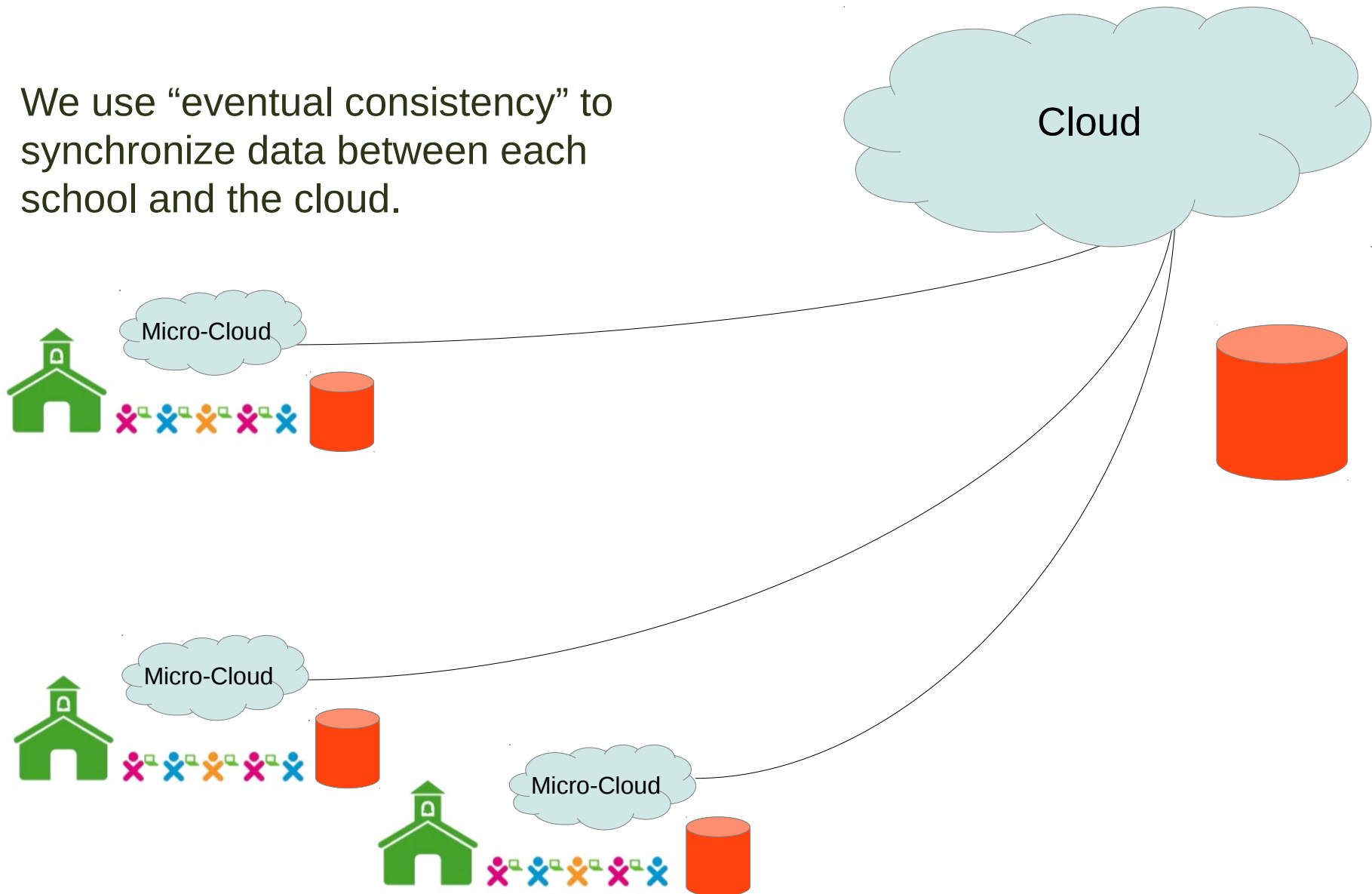
CouchDB

Apache CouchDB™ is a database that uses **JSON** for documents, **JavaScript** for **MapReduce** indexes, and regular **HTTP** for its **API**

http://couchdb.apache.org

Database, Aggregation, Offline Sync, Document Storage, NoSQL, etc.

Replication

CouchDB supports "eventual consistency" through incremental replication and conflict management between CouchDB instances at the schools and a central location, such as the Ministry of Education

Cloud

Micro-Cloud

replication

Micro-Cloud

Micro-Cloud

xovis

process_journal_stats.py

Methods:
metadata
stats
dbinsert

csv

Excel
LibreOffice
R

json

CouchDB

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XOVis: Quest for Data

Activity Frequency

Select a deployment site:

olpc

Activity Frequency

Files Generated

Activities Shared

Time of Day Use

Use by Month

Use by Year

Use of Each Activity by Year

Use of Each Activity by Month

Activity Name

Web
Oficina
Develop
TurtleArt
Weather
Abacus
Measure
physics
SimpleGraph
Speak
Abecedarium
Calculate
Chat
Etoys
Finance
IconChange
Implode
InfoSlicer
IRC
Labyrinth
Memorize
Moon
MusicKeyboard
Pippy
Portfolio
Record
Ruler
ShareStats
TamTamEdit
Terminal
TurtleArtButia
WikipediaEN
Words
XoScope

0   0.5   1   1.5   2   2.5   3   3.5   4   4.5   5   5.5   6   6.5   7   7.5

Launched Instances

Built using Highcharts JS

http://schoolserver:5984/xovis/_desig

XOVis: Quest for Data

Select a deployment site:

olpc

Activity Frequency

Files Generated

Activities Shared

Time of Day Use

Use by Month

Use by Year

Use of Each Activity by Year

Use of Each Activity by Month

Activity Files Generated

Files Created

Activity Name

Web, Oficina, Develop, TurtleArt, physics, SimpleGraph, Chat, Story, Finance, IRC, Measure, Pippy, TurtleArtButia, WikipediaEN

Built using Highcharts JS

http://schoolserver:5984/xovis/_desig

XOVis: Quest for Data

Select a deployment site:

olpc

Activity Frequency

Files Generated

Activities Shared

Time of Day Use

Use by Month

Use by Year

Use of Each Activity by Year

Use of Each Activity by Month

Activity Sharing

Shared Instances

Activity Name

Web
Oficina
Develop
Abacus
Measure
physics
Abecedarium
Calculate
Chat
Implode
IRC
Moon
MusicKeyboard
Pippy
Ruler
ShareStats
TamTamEdit
WikipediaEN
Words
XoScope

Built using Highcharts JS

http://schoolserver:5984/xovis/_desig

XOVis: Quest for Data

Select a deployment site:

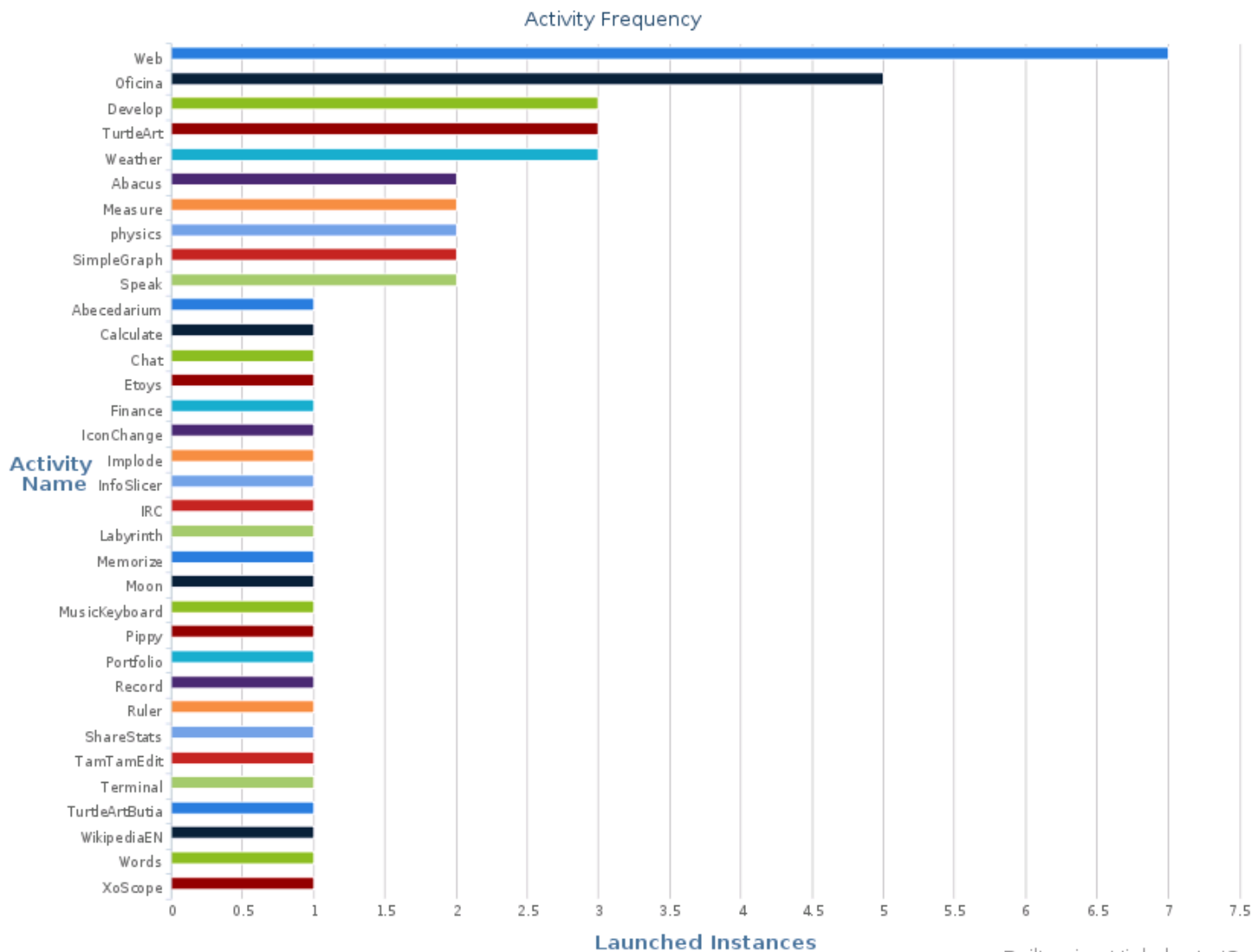olpc

Activity Frequency

Files Generated

Activities Shared

Time of Day Use

Use by Month

Use by Year

Use of Each Activity by Year

Use of Each Activity by Month

Time of Day Activity Use

Launched Instances

Hour

Built using Highcharts JS

http://schoolserver:5984/xovis/_desig

XOVis: Quest for Data

Select a deployment
site:

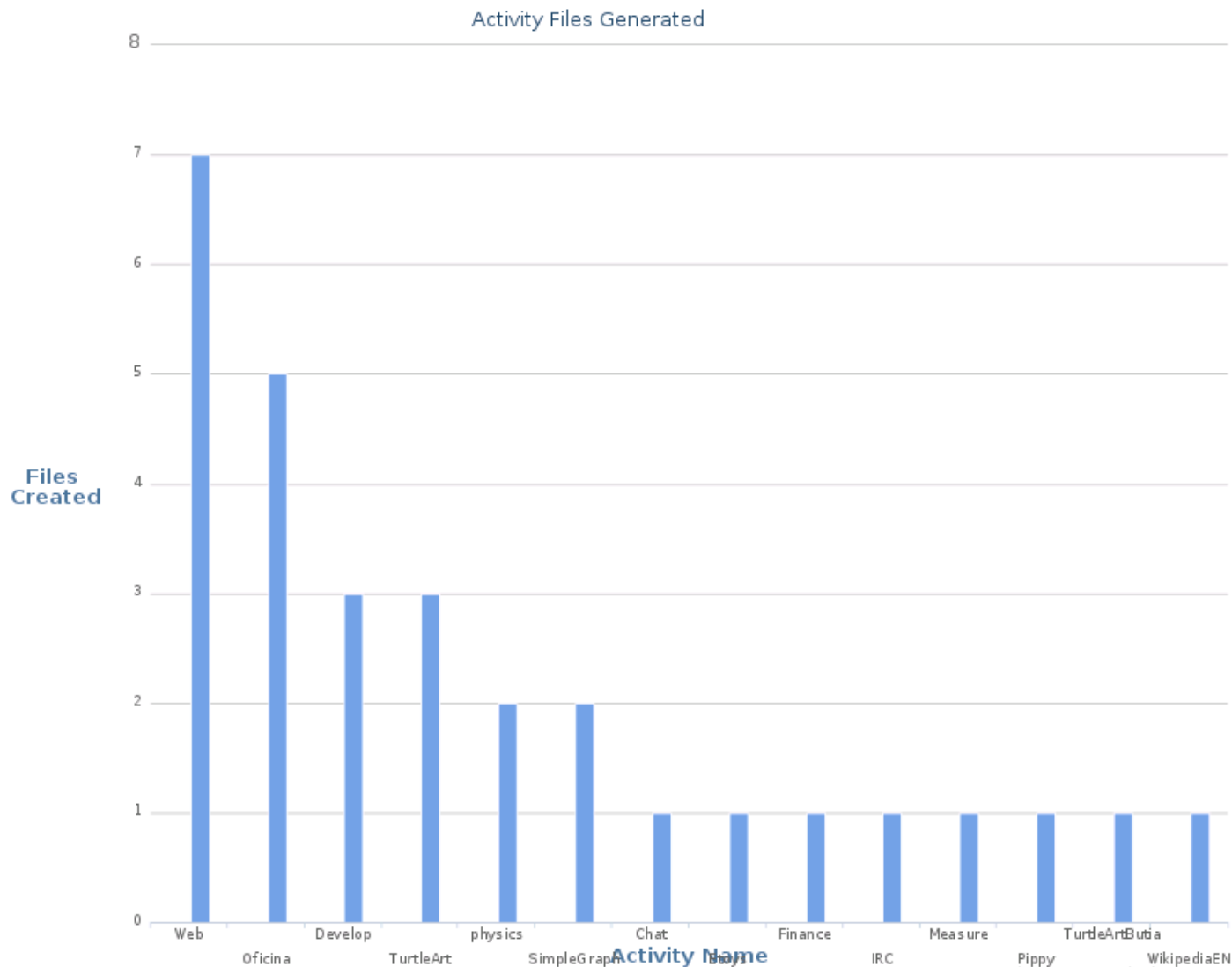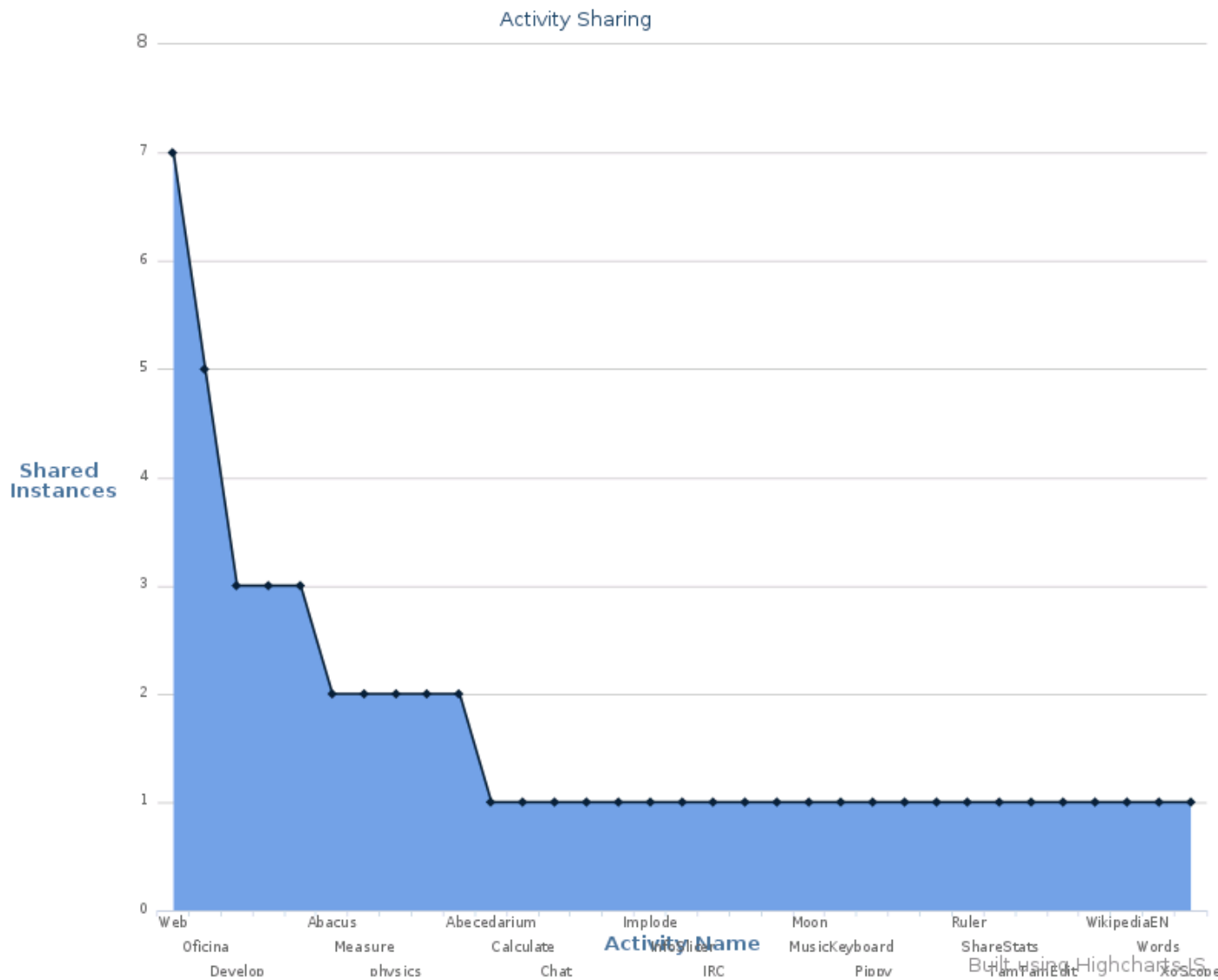olpc

Activity
Frequency

Files
Generated

Activities
Shared

Time of Day
Use

Use by
Month

Use by Year

Use of Each
Activity by
Year

Use of Each
Activity by
Month

Activity Use By Months

Month May

Month	
January	
February	
March	
April	
May	
June	
July	
August	
September	

**Launched
Instances**

Built using Highcharts JS

XOVis: Quest for Data

Select a deployment site:

olpc

- Activity Frequency
- Files Generated
- Activities Shared
- Time of Day Use
- Use by Month
- Use by Year
- Use of Each Activity by Year
- Use of Each Activity by Month

Activity Use By Years

Launched Instances

Year

Built using Highcharts JS

XOVis: Quest for Data

Activity Use By Years

Select a deployment site:

olpc

- Activity Frequency
- Files Generated
- Activities Shared
- Time of Day Use
- Use by Month
- Use by Year
- Use of Each Activity by Year
- Use of Each Activity by Month

Launched Instances

Year

Click on a label to toggle its display

- Abacus
- Abecedarium
- Calculate
- Chat
- Develop
- Etoys
- Finance
- IconChange
- Implode
- InfoSlicer
- IRC
- Labyrinth
- Measure
- Memorize
- Moon
- MusicKeyboard
- Oficina
- physics
- Pippy
- Portfolio
- Record
- Ruler
- ShareStats
- SimpleGraph
- Speak
- TamTamEdit
- Terminal
- TurtleArt
- TurtleArtButia
- Weather
- Web
- WikipediaEN
- Words
- XoScope

Built using Highcharts JS

http://schoolserver:5984/xovis/_desig

XOVis: Quest for Data

Select a deployment site:

olpc

- Activity Frequency
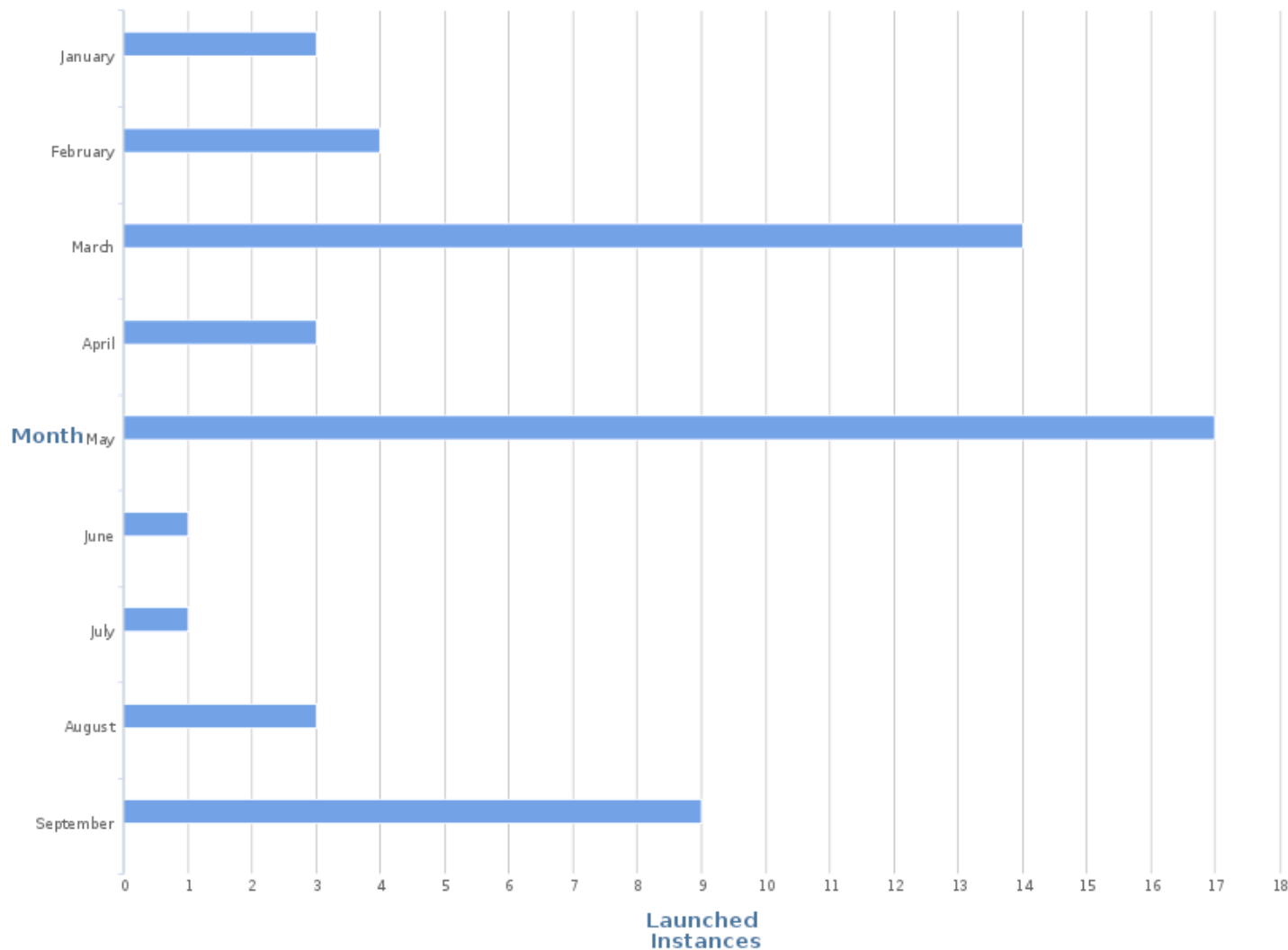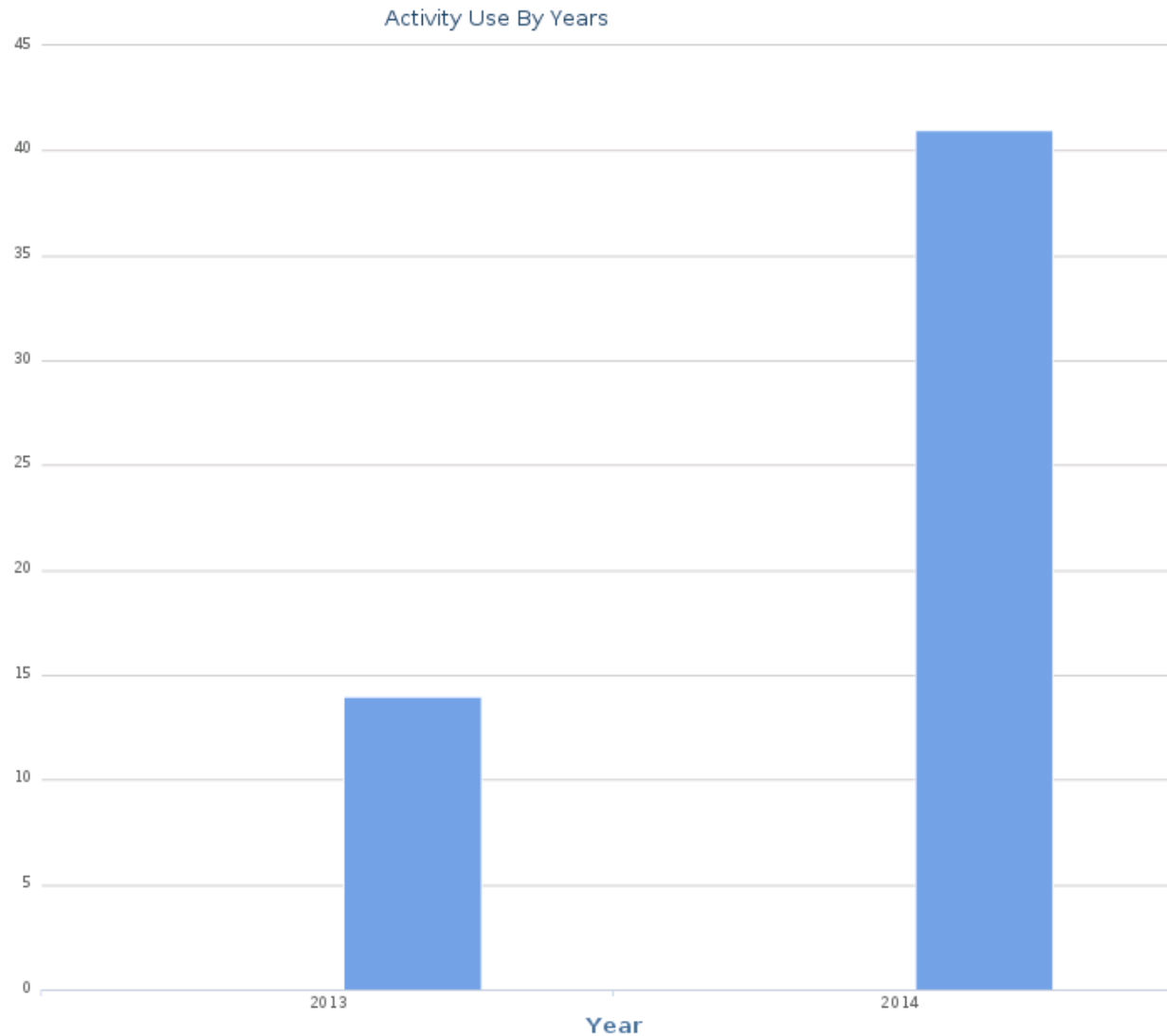- Files Generated
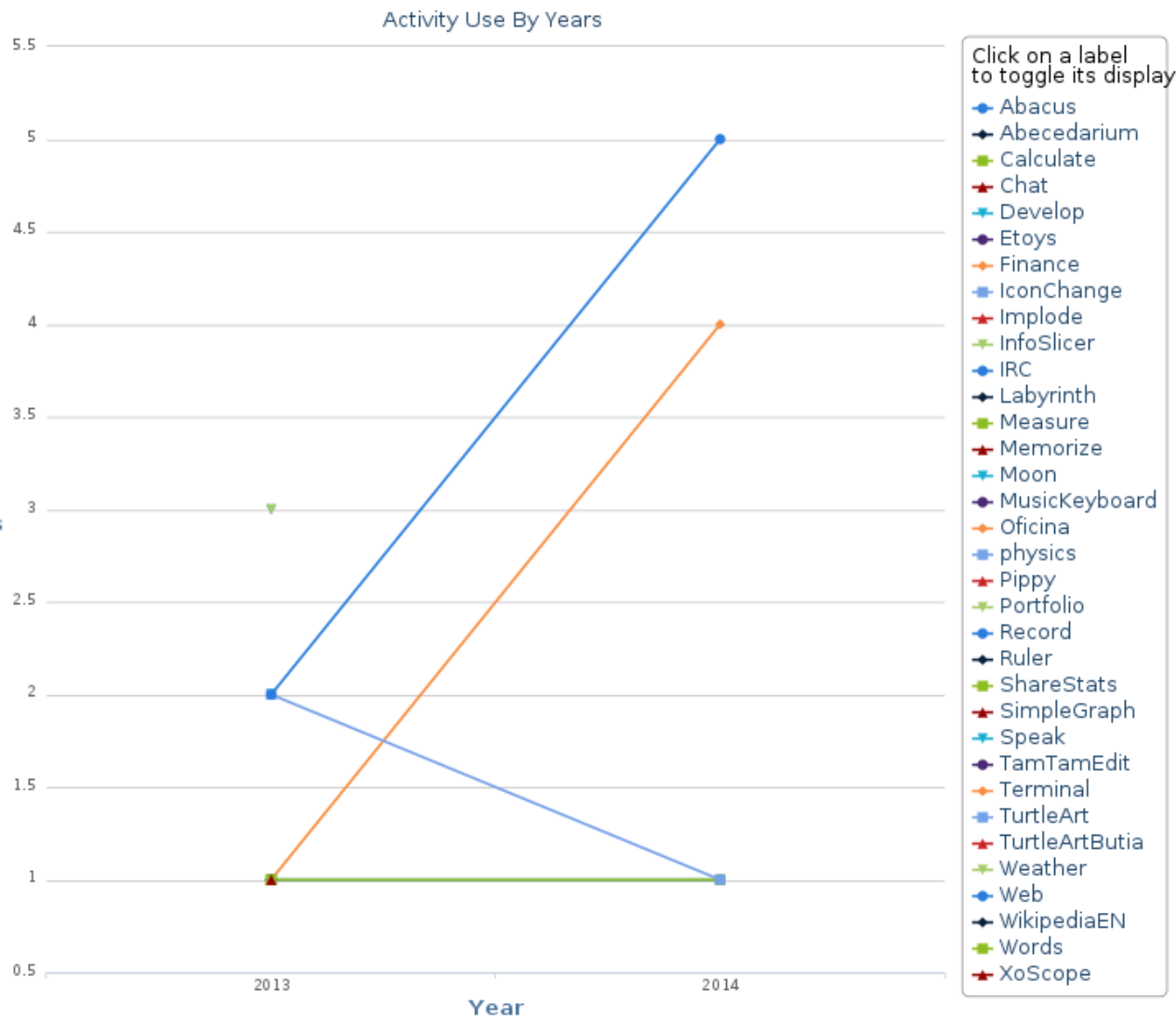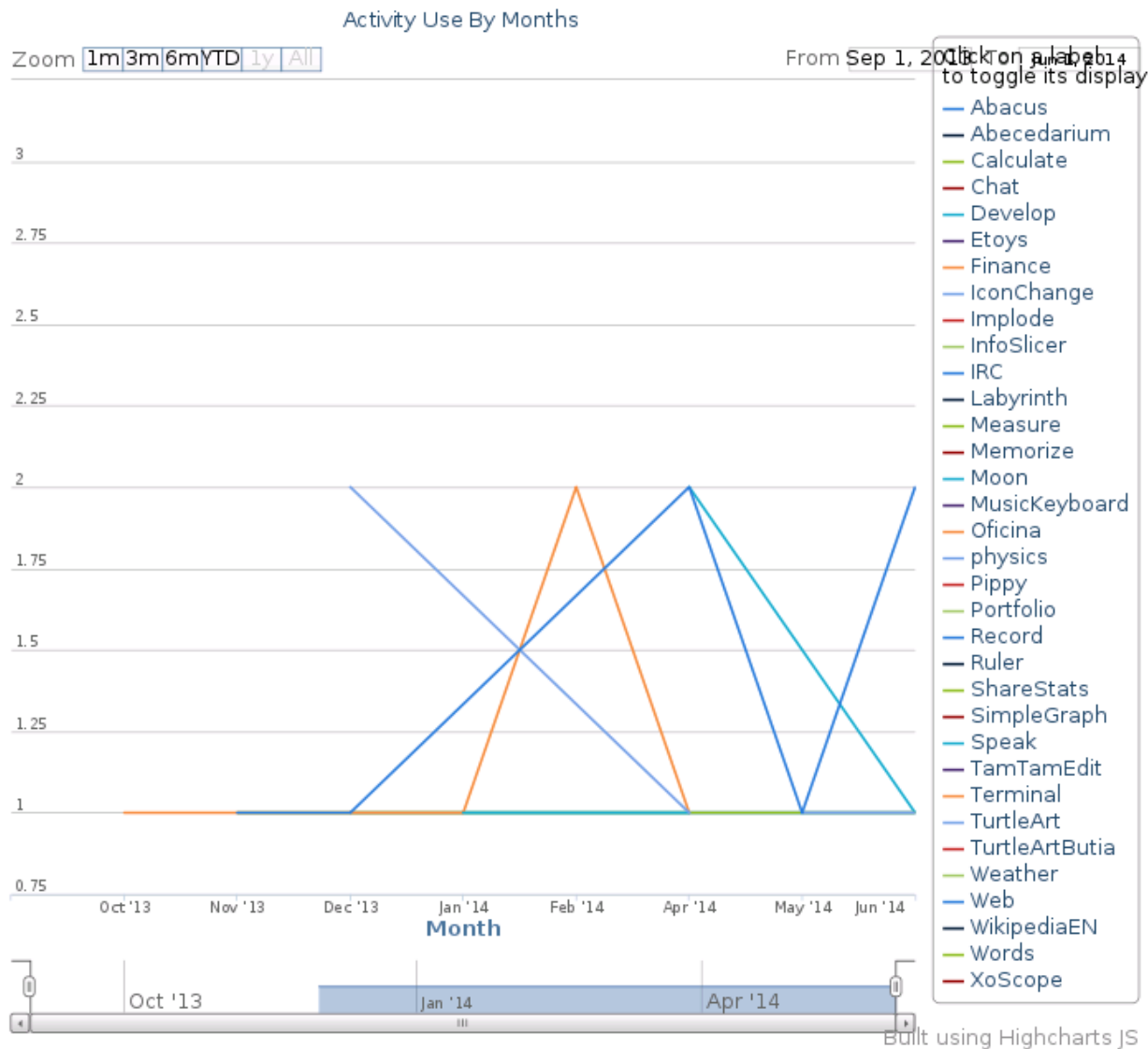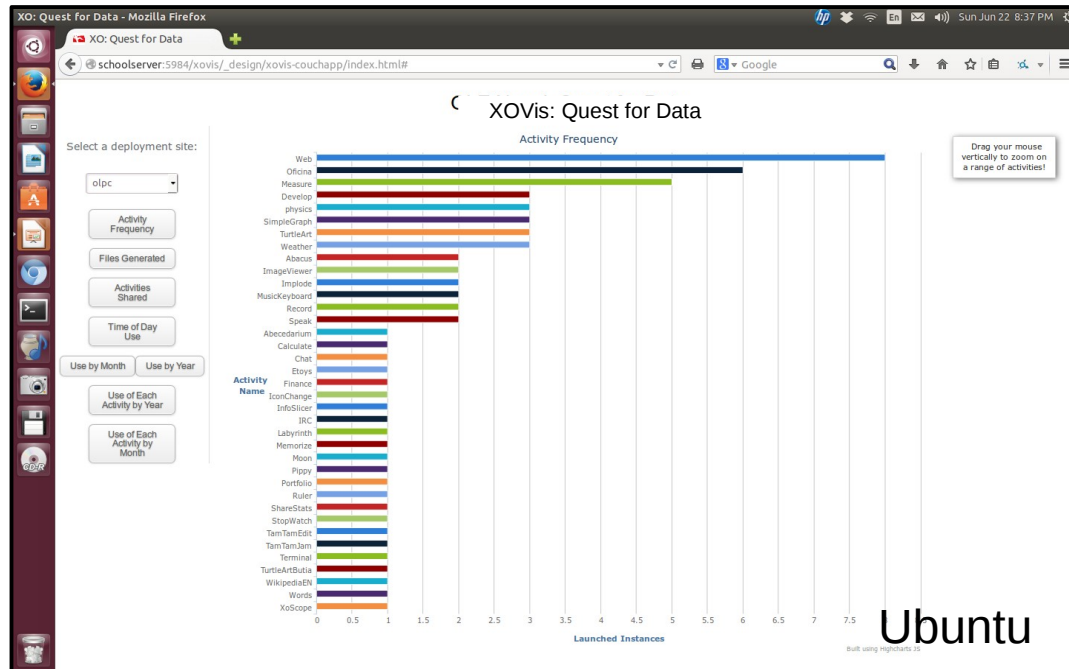- Activities Shared
- Time of Day Use
- Use by Month
- Use by Year
- Use of Each Activity by Year
- Use of Each Activity by Month

Activity Use By Months

Zoom 1m 3m 6m YTD 1y All

From Sep 1, 2013 to Jun 1 2014

Click on a label to toggle its display

- Abacus
- Abecedarium
- Calculate
- Chat
- Develop
- Etoys
- Finance
- IconChange
- Implode
- InfoSlicer
- IRC
- Labyrinth
- Measure
- Memorize
- Moon
- MusicKeyboard
- Oficina
- physics
- Pippy
- Portfolio
- Record
- Ruler
- ShareStats
- SimpleGraph
- Speak
- TamTamEdit
- Terminal
- TurtleArt
- TurtleArtButia
- Weather
- Web
- WikipediaEN
- Words
- XoScope

Launched Instances

3

2.75

2.5

2.25

2

1.75

1.5

1.25

1

0.75

Oct '13   Nov '13   Dec '13   Jan '14   Feb '14   Apr '14   May '14   Jun '14

Month

Oct '13   Jan '14   Apr '14

Built using Highcharts JS
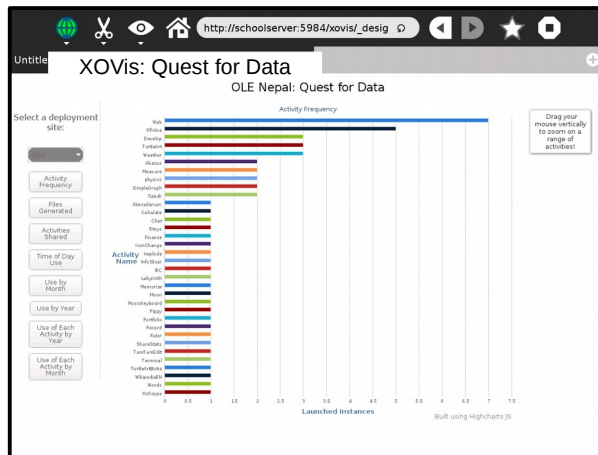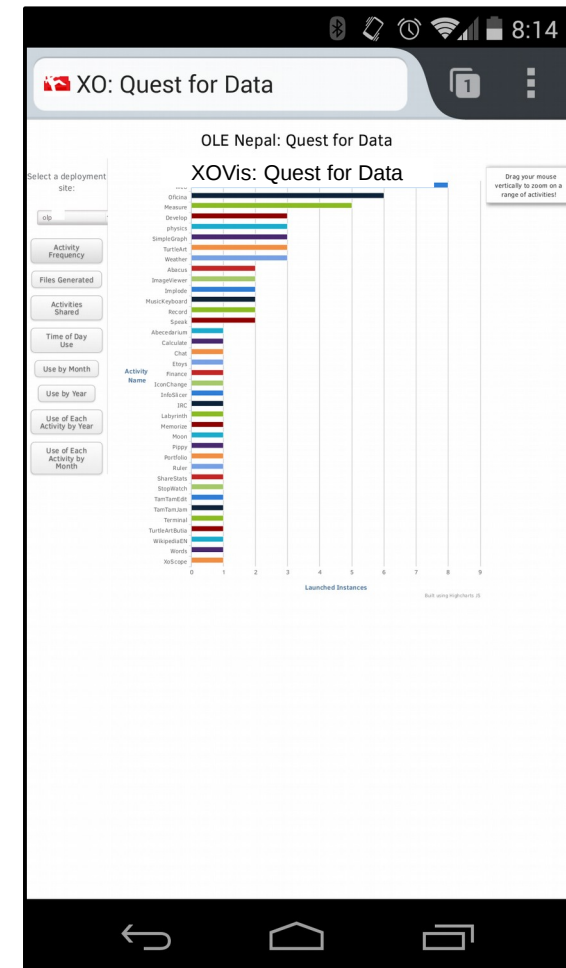
The Power of HTML5

Ubuntu

Sugar

Android

Scope

- Add multiple schools or deployments
  - Within a country
  - Across countries

- Compare certain stats across multiple deployments

SF STATE

Development continues. Join us!

https://github.com/martasd/xovis