Suma: an open-source toolkit for library assessment

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Bret Davidson

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Problem statement

- Many libraries perform manual counts of people in spaces doing something at some time
- The process involves tedious collection mechanisms, lots of paperwork, and much room for error
- There is no coordinated effort to help departments analyze their data

Our solution

An open source tablet-based app (well, toolkit) to aid library staff in assessment of how patrons are using library spaces.

In other words…the gathering, storing, exporting, analyzing, and visualizing of data across spaces/activities/time and around events.

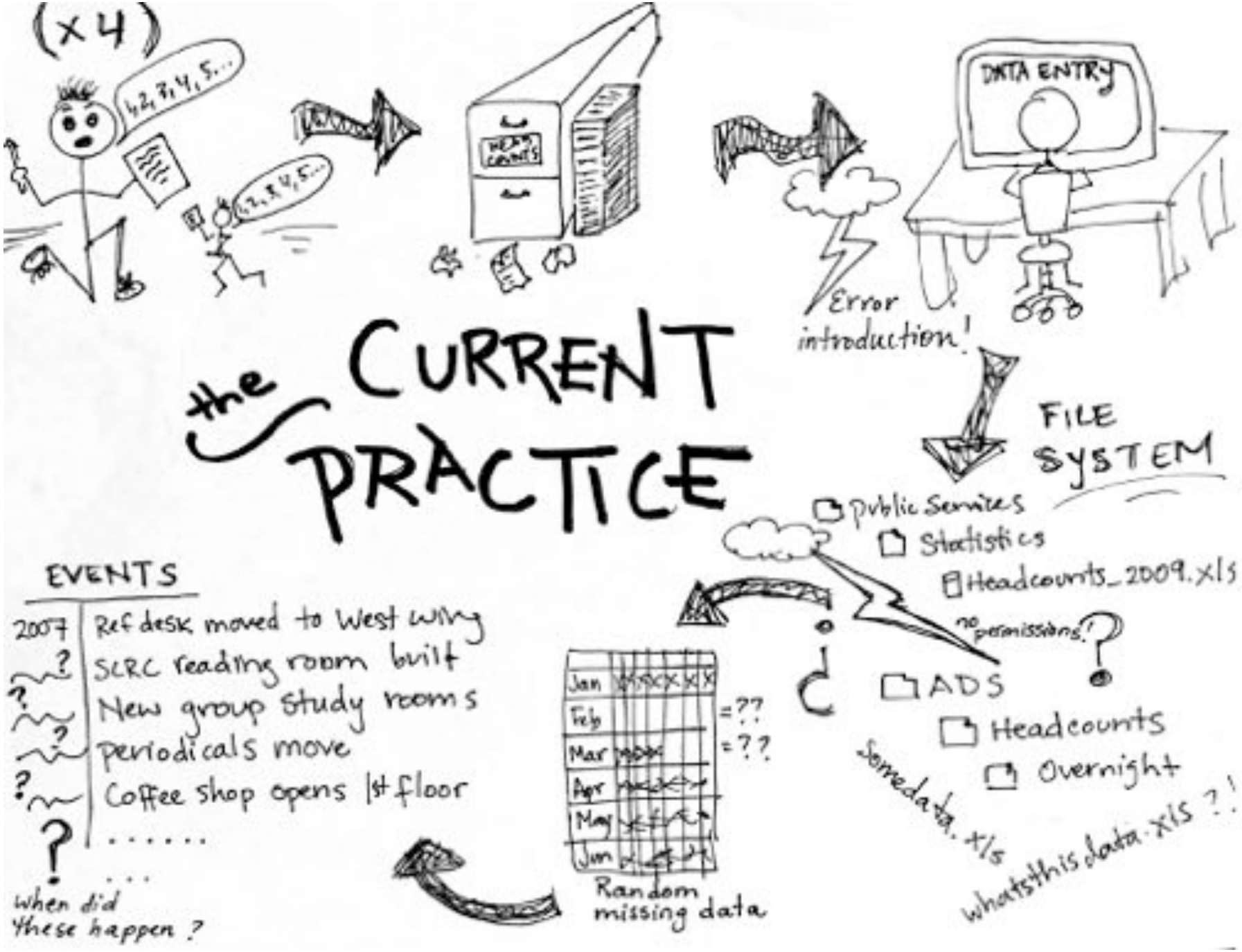

Illustration by Joyce Chapman

Noon Head Count

		2/21/2011	2/22/2011	2/23/2011	2/24/2011	2/25/2011	2/26/2011	2/27/2011
		Mon	Tues	Wed	Thurs	Fri	Sat	Sun
	Ground Floor	93	71	139	105	79	15	20
	Lobby and Mezzanine	35	35	43	58	56	13	16
Tower/ Stacks	9th Floor	29	32	51	50	31	7	18
	8th Floor	38	28	50	29	34	2	8
	7th Floor	51	38	42	31	14	5	13
	6th Floor	42	47	48	46	30	9	6
	5th Floor	42	36	41	33	37	12	4
	4th Floor	42	49	42	43	23	10	10
	3rd Floor	38	35	46	35	26	15	15
	2nd Floor	42	29	40	33	29	16	16
	Unity Lab	28	28	35	23	21	6	1
East Wing	Spec. Coll. Reading Rm.	39	31	41	35	28	15	19
	Digital Media Lab	18	13	21	13	18	4	5
	1st Floor	220	205	240	221	269	42	73
	2nd Floor	17	26	22	29	14	0	3
West Wing	Techonlogy Sandbox	15	7	12	8	16	3	2
	Quiet Reading Room	55	48	67	60	51	6	10
	1st Floor	28	20	54	39	34	2	0
	2nd Floor	10	5	16	12	6	0	3
	Total	882.	808	1060	903	816	196	245
	Initials	LG.	ES	EE	ECB	EBG	LG.	ECB

Definitions:
Lobby and Mezzanine: study tables on balcony, sitting area in front of circ, print/copy/scan/room, hallway surrounding circ
1st Floor East Wing: computer area, couches, study rooms, presentation practice room
Ground Floor: reading room, guest computers, Hill of Beans, entryway, express desk
2nd Floor East Wing: Does not include classroom/office spaces like ITTC labs
2nd Floor West Wing: Does not include classroom/office spaces like auditorium and mini-theater

Security Patrol Head Count

Date: 5/3/11

		10:00PM	12:00AM	2:00AM	4:00AM
	Ground Floor	80	33	14	6
	Lobby and Mezzanine	40	31	11	9
Tower/ Stacks	9th Floor	101	59	46	25
	8th Floor	75	68	33	12
	7th Floor	89	56	36	20
	6th Floor	89	58	36	22
	5th Floor	63	55	23	10
	4th Floor	54	42	12	10
	3rd Floor	64	30	21	13
	2nd Floor	51	34	12	6
	Unity Lab	27	23	9	6
East Wing	Spec. Coll. Reading Rm.	67	50	29	15
	Digital Media Lab	26	19	8	5
	1st Floor (Commons)	278	226	113	36
	2nd Floor	33	25	14	6
West Wing	Technology Sandbox	18	15	5	2
	Quiet Reading Room	57	38	15	5
	1st Floor	50	41	8	6
	2nd Floor	75	52	13	9
Total		1339	983	499	233
Patrol (initials)		AS	TP	AS	TP

Definitions:
Lobby and Mezzanine: study tables on balcony, sitting area in front of circ, print/copy/scan/room, hallway surrounding circ
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Computer = Computer, laptop use
SMART = SMART Board use
MSurace = Microsoft Surface use
Pixel = Perceptive Pixel use
4screen = QuadScreen Projecting use
Gaming = Gaming (XBox, PS3, Wii)
Other = Other (Socializing, Reading, eating etc.)

INDIVIDUAL	Computer	SMART	MSurface	Pixel	4screen	Gaming	Other
Total#							

DML Observation

INSTRUCTIONS: Tally the activities people are doing on their own using the designated codes below. If people are working in a group, tally them in the 'group' column, and circle each group (example: (II) (IIII)).

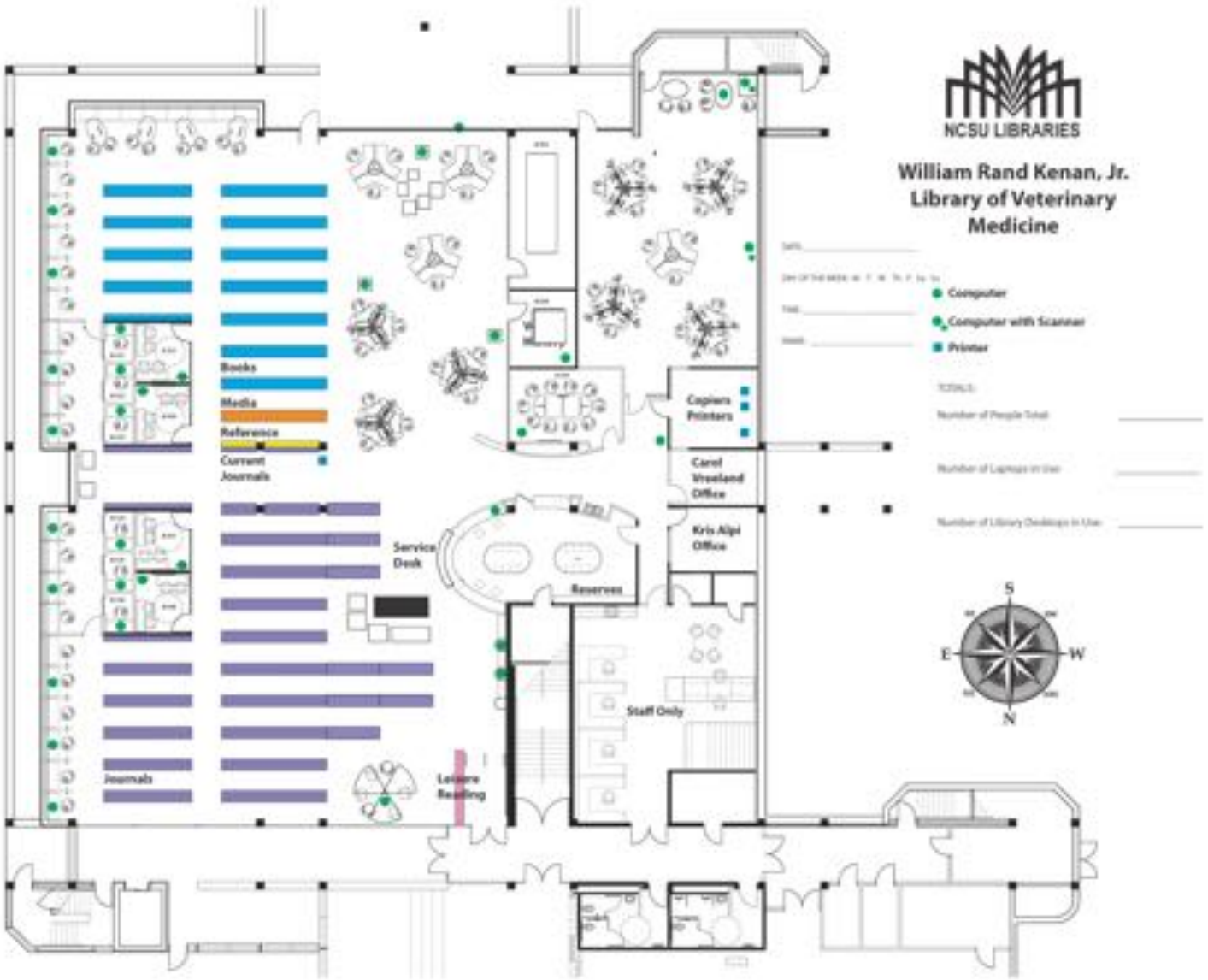
M = Multimedia creation (photo/video editing, video importing/conversion, other multimedia work)
T = Touchscreen use: USING TOUCHSCREEN FUNCTIONALITY (Lenovo PCs)
S = Scanning (Document and book scanning, negative/slide scanning)
C = General Computing (Social Networking, word processing, web-browsing, email, chat, etc.)

Activity	# of ppl Alone	# of ppl in Group (Circle each group)
M	III	(II)
T	I	
S	~~HHH~~ I	
C	III	(II)

DATE: 04/12/11
TIME: 2:30
STAFF: EBG

NOTES (Interesting activity, use of technology, etc.):

- LARGE BATCH SCAN OF SLIDES
- AUDACITY / SOUND MIXING
- SCANNING 35MM FILM (USED EPSON SCANNING W/ PADDING TAKEN OFF)

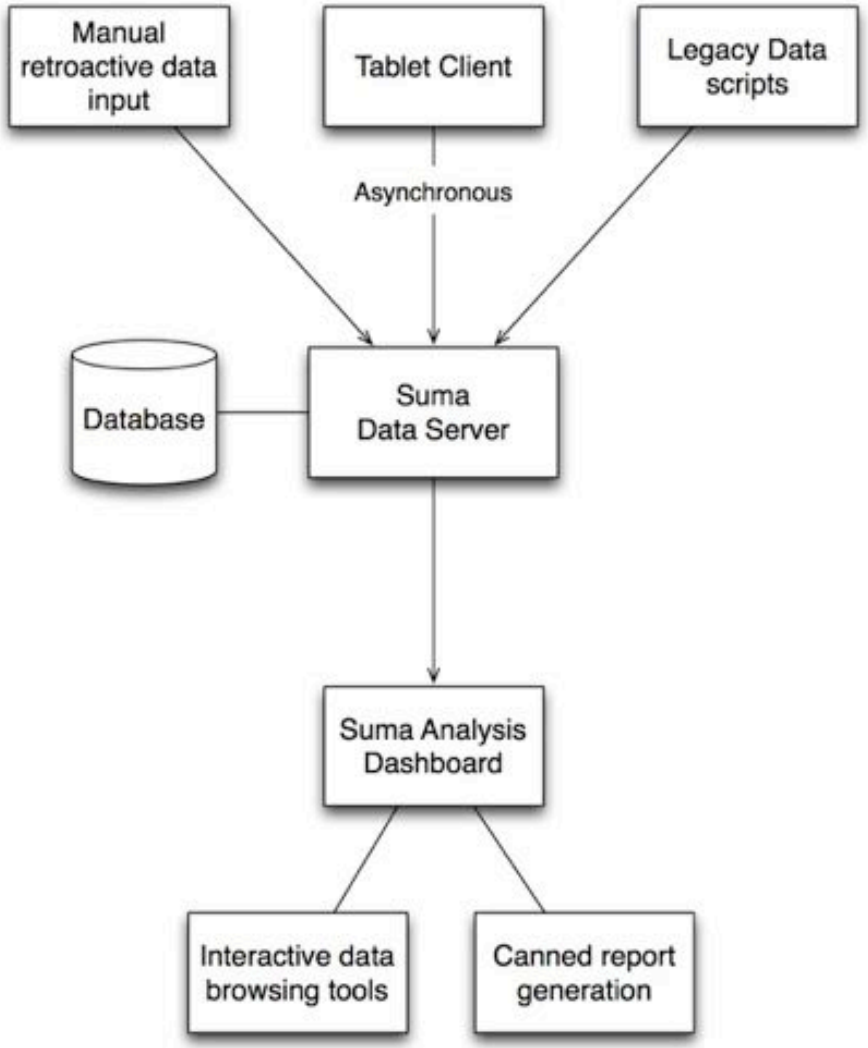

NCSU LIBRARIES
William Rand Kenan, Jr. Library of Veterinary Medicine
Computer
Computer with Scanner
Printer
Books
Media
Reference
Current Journals
Journals
Service Desk
Reserves
Copiers Printers
Carol Vreeland Office
Kris Alpi Office
Staff Only
Lecture Reading
S
E
W
N

Activity tracking

- Are some spaces more conducive to group study or individual study?
- What's the ratio of usage of laptops versus public computers versus no computers?
- Do changes to space components change the type of usage?

New in the last year

What is the system?



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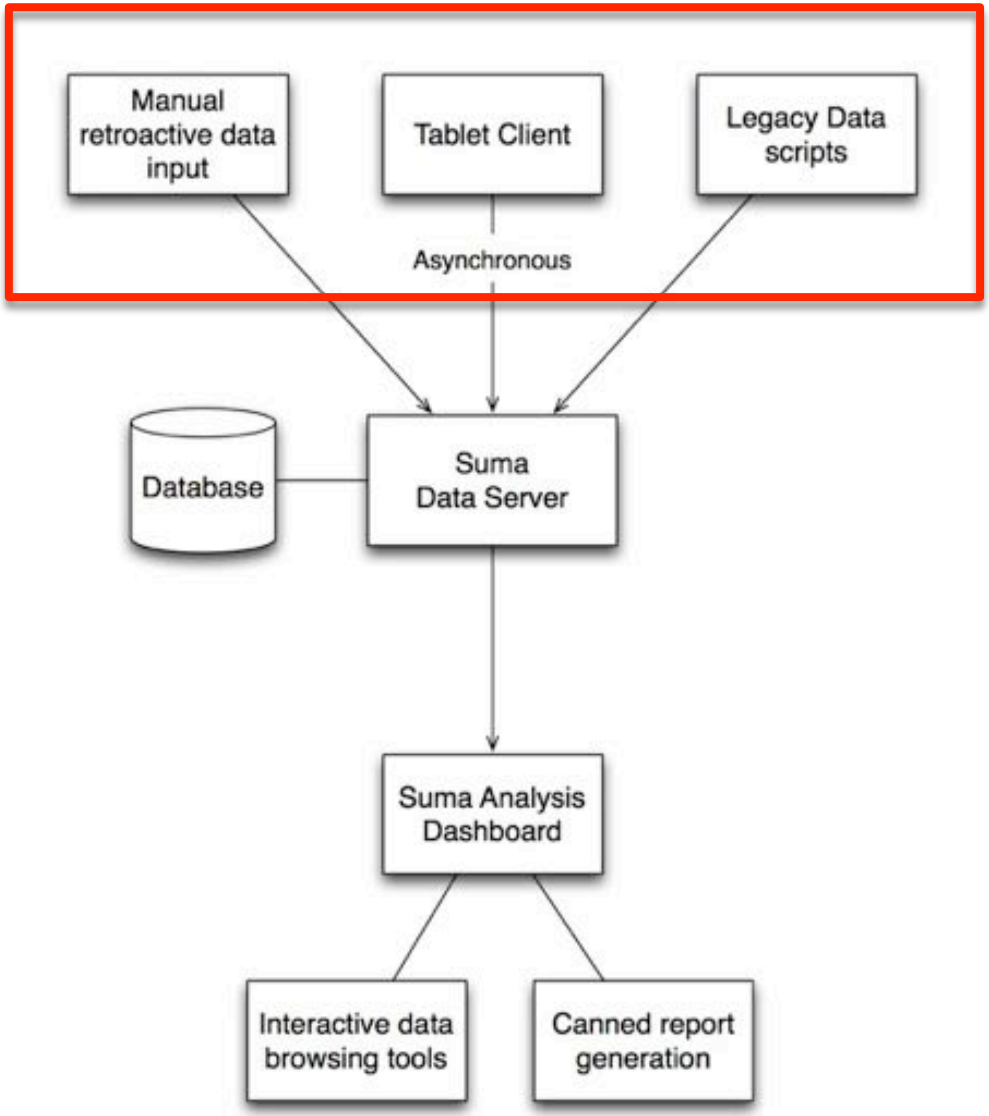
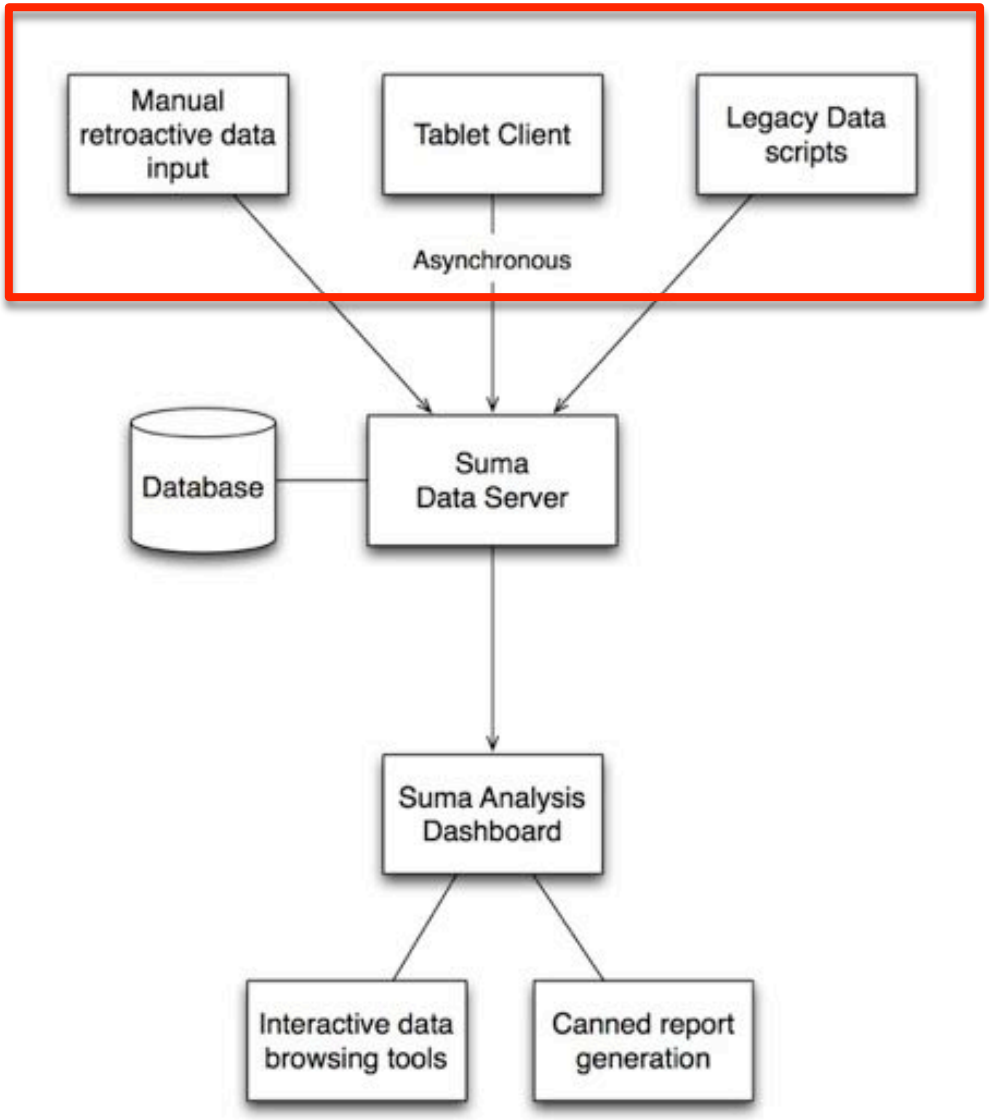


What is the system?

We talked about this last year.



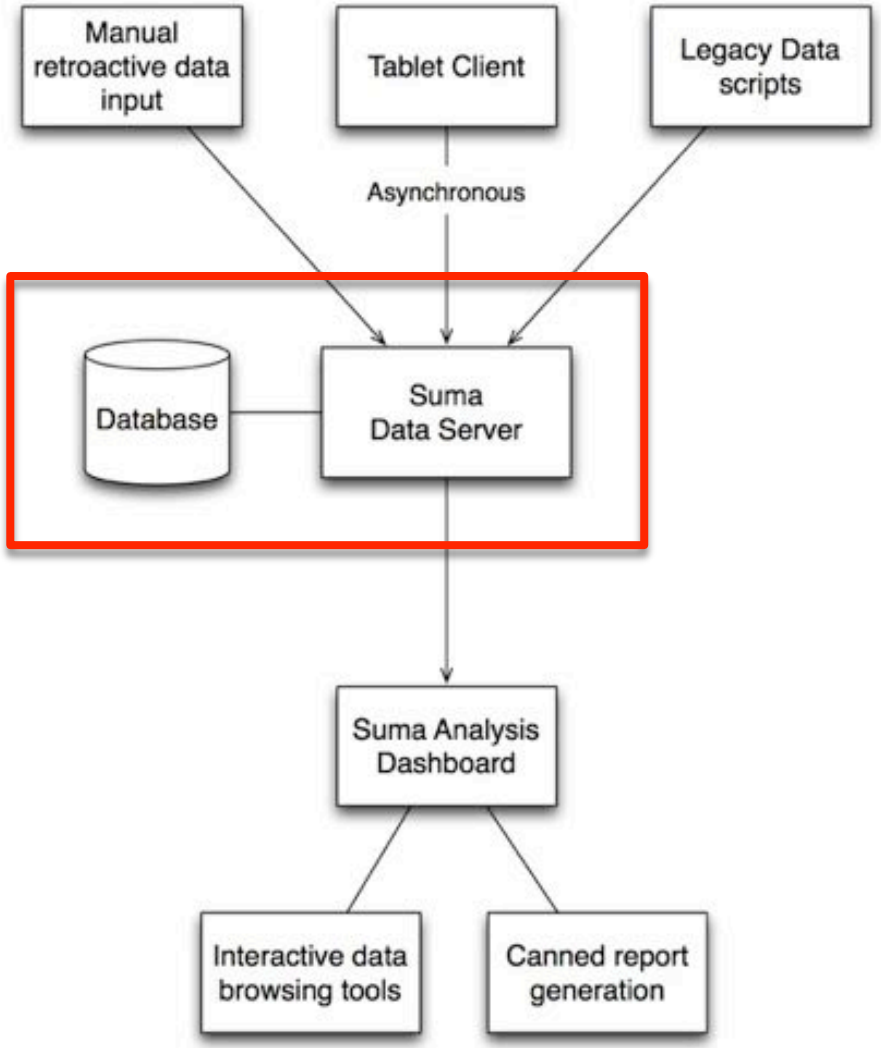

Carrier
4:16 PM
Space Usage Census Tool
webdev.lib.ncsu.edu/spaceassess/web/
Undo last count
Finish Collecting
Select a collection Program:
Headcounts
Tap on a location:
D. H. Hill Library
Tower/stacks
Ground Floor
Lobby and mezzanine
West Wing
East Wing
Unity lab
2nd floor
3rd floor
4th floor
5th floor
6th floor
7th floor
8th floor
9th floor
D. H. Hill Library | Tower/stacks | 2nd floor
3


Carrier
4:44 PM
100%
Suma: Space Usage Tool
Google
Undo last count
Abandon Counts
Finish Collecting
Select a collection program:
Reference Desk Transactions
Tap on a location:
D. H. Hill Library
Tower/Stacks
Ground Floor
Lobby and Mezzanine
West Wing
East Wing
Technology Sandbox (6)
Quiet Reading Room
ConeZone & Creamery
WW 1st floor
WW 2nd floor
Terrace
D. H. Hill Library | West Wing | Technology Sandbox
Type: Print/copy
Type: Reference
Type: Directional
Type: Computing
Medium: In-person
Medium: Phone
Time: A few seconds
Time: Less than five minutes
Time: Five to ten minutes
Time: Long
6

Staff as sensors

Joyce Chapman: librarian, project team member, slide contributor, wireframer, data analyst, illustrator.

What is the system?

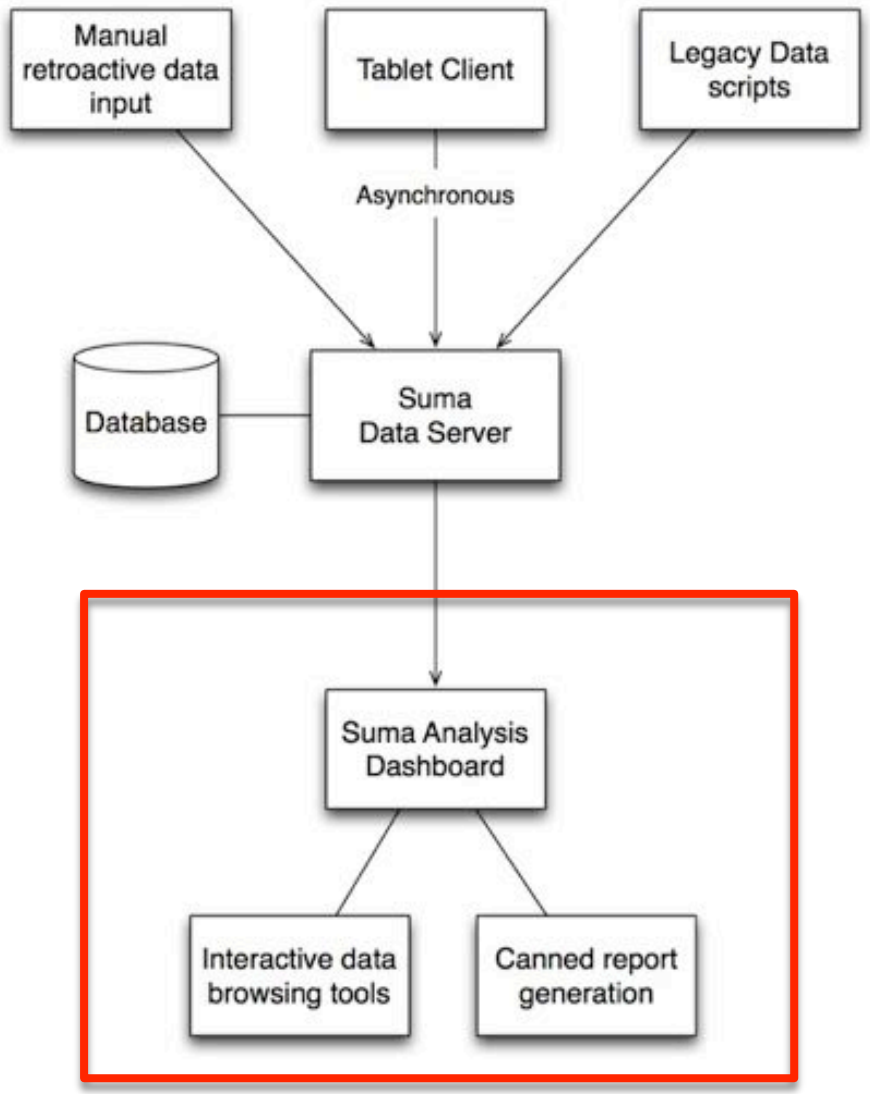


This actually works now (notes)

- Manage initiatives, locations, and activities
- Normalize, backup data
- Performance-optimized data querying web service
- Documentation
- Open-source release

Thanks, Eric!

What is the system?



Section themes

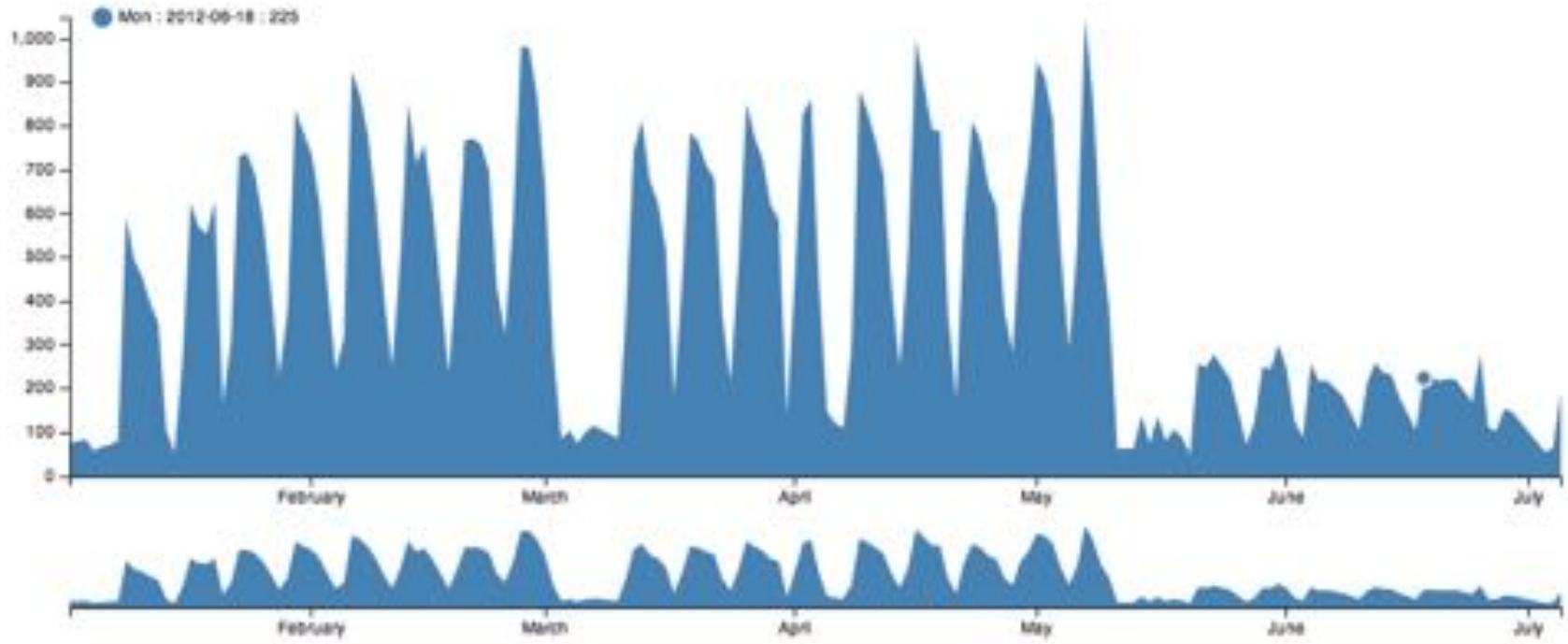
- Show-off visualizations
- User questions we hope to answer
- Viz principles
  - Data to ink ratio
  - Focus on answering questions
  - Multiple views on the same data
  - Interactive usage
- Mention d3, principles of using native browser tools
- Suma architectural benefits (decoupling analysis from server)
- Future plans
  - CSV output
  - Proportional activity views
  - Experimental viz

Visualization Principles

- Focus on answering real questions
- Interactive usage
- Multiple views of same data
- Apply best practices
  - High “data to ink” ratio
  - Don’t distort data
  - Tufte, Few, etc.

Questions

- Are there trends in usage across different spaces?
- How does one semester compare to another?
- Which locations support which activities?
- What reference transactions are being supported most?



Initiative D.H. Hill Head Count

Start Date 20120101 YYYYMMDD

End Date 20120706 YYYYMMDD

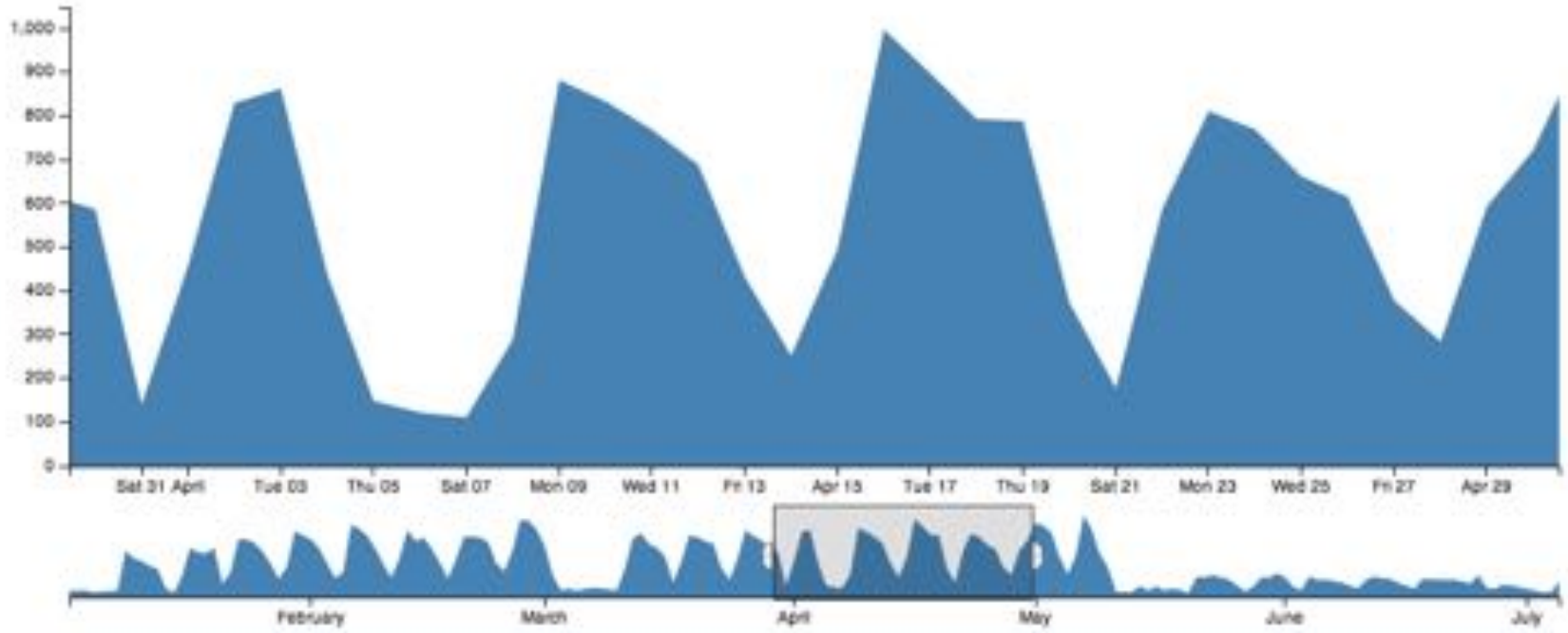
Start Time 0800 HHMM

End Time 2300 HHMM

Days All

Avg/Sum Average

Submit



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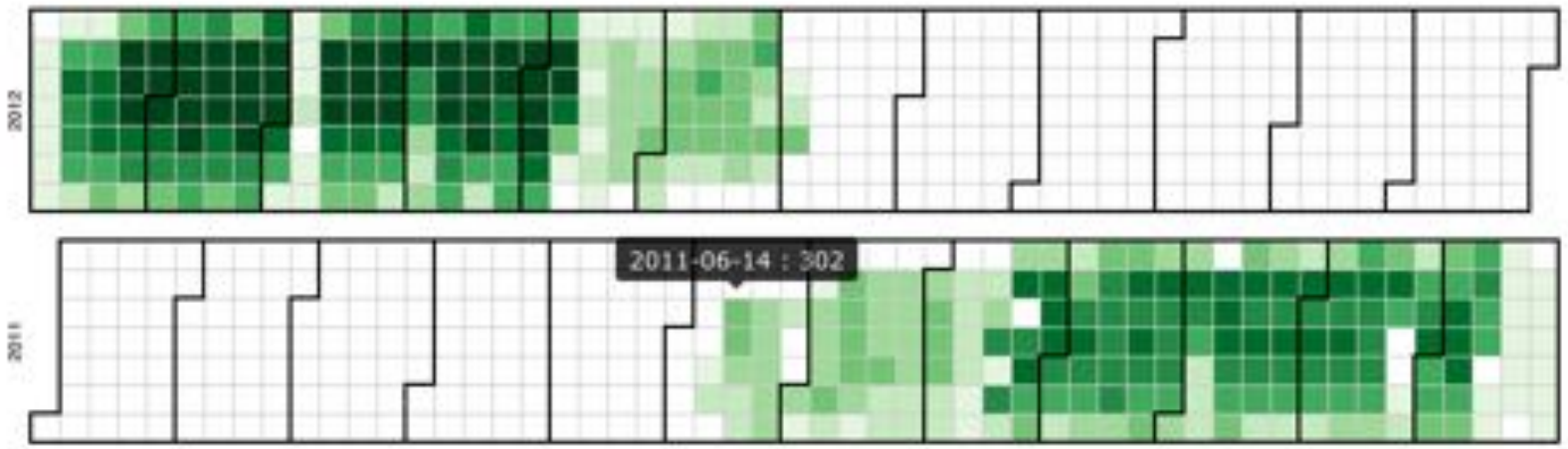
Initiative D.H. Hill Head Count Submit



Browser Based Tools

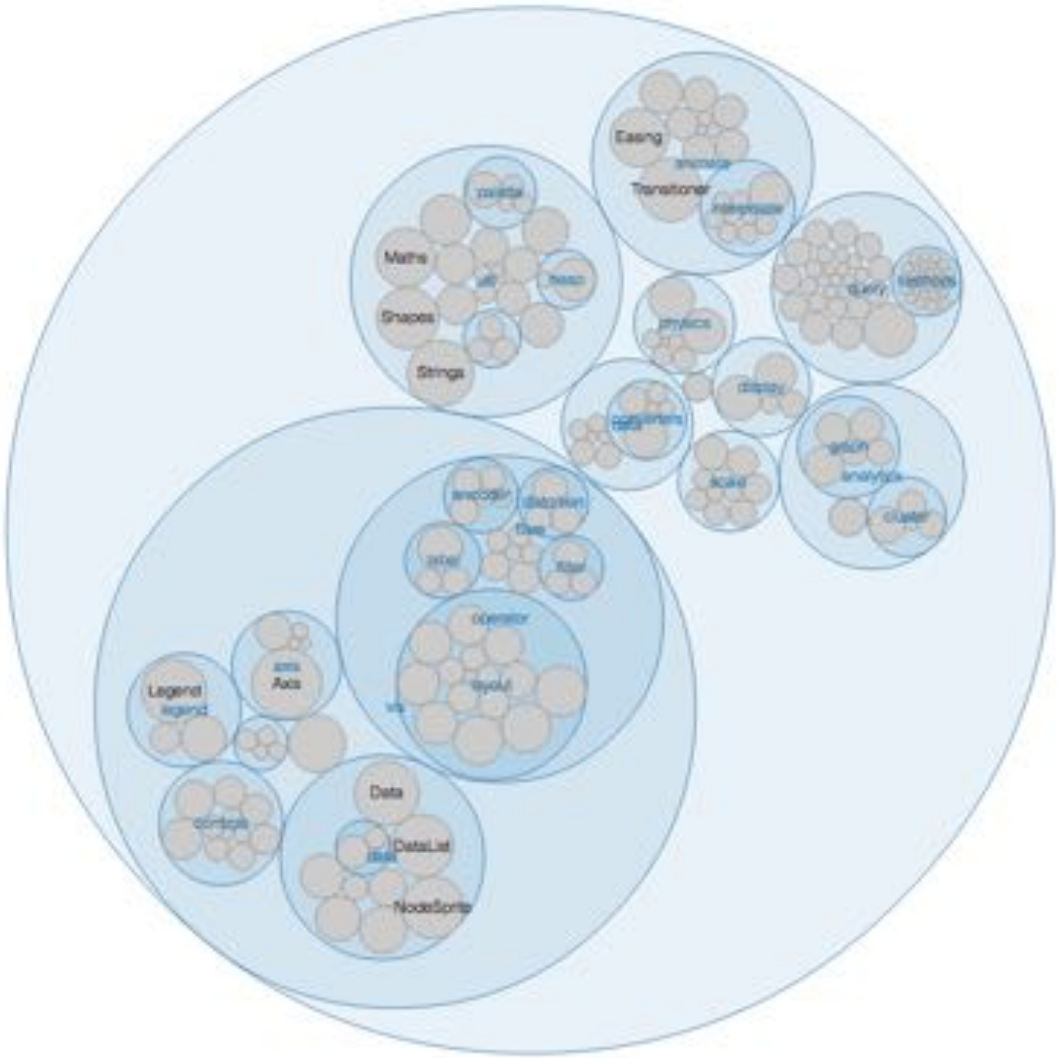
- D3.js => d3js.org
- SVG
- Advantages
  - Interactive
  - Portable
  - Known technologies

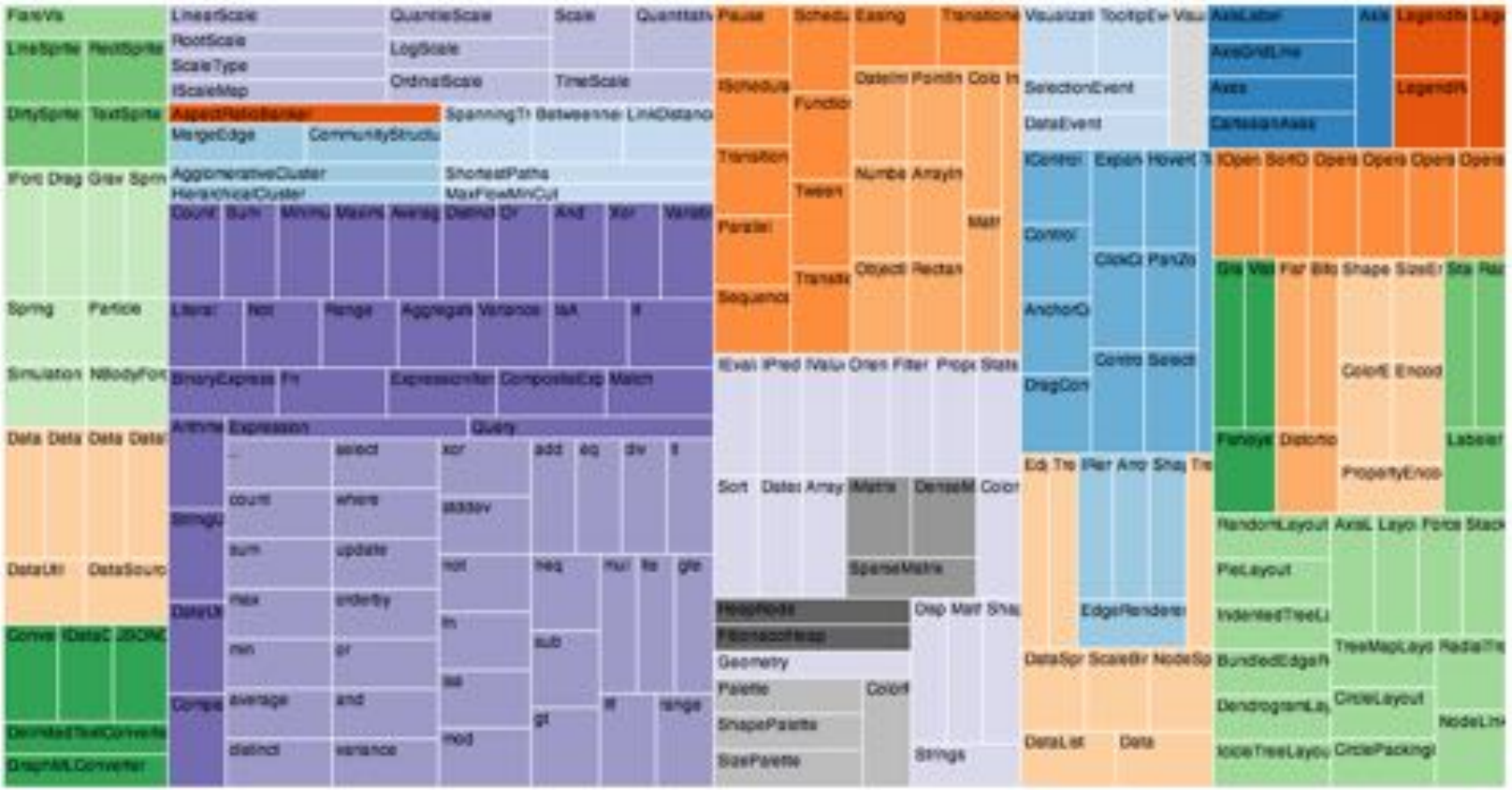
Suma Architecture

- Analysis is decoupled from Server
- Use what you want!
  - Google Charts
  - Processing
  - Raphael
  - http://selection.datavisualization.ch/

Future Analysis

- CSV export of selected data
- Proportional analysis of activities
- Experimental Visualizations


Easing
Transitioner
Maths
Shapes
Strings
physics
query
methods
display
scale
analytics
cluster
encoder
operator
layout
Legend
legend
axis
Axis
controls
Data
DataList
NodeSortip



Future directions

- Analysis dashboard tools
- Legacy data

Project team

- Jason Casden
- Joyce Chapman
- Rob Rucker
- Eric McEachern
- Rusty Earl
- Bret Davidson

Thanks!

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http://www.lib.ncsu.edu/dli/projects/spaceassesstool
http://github.com/cazzerson/Suma