

**Smart Museums:
Novel Technologies for
Enhancing Exhibits and Visitor
Learning
Saturday, October 21, 2017
2:00 PM - 3:15 PM,**



Smart Museums: Novel Technologies for Enhancing Exhibits and Visitor Learning

Sherry Hsi, Ph.D.

ASTC 2017 San Jose



**The Concord
Consortium**

Smart Museums: Novel Technologies for Enhancing Exhibits and Visitor Learning

Session Summary

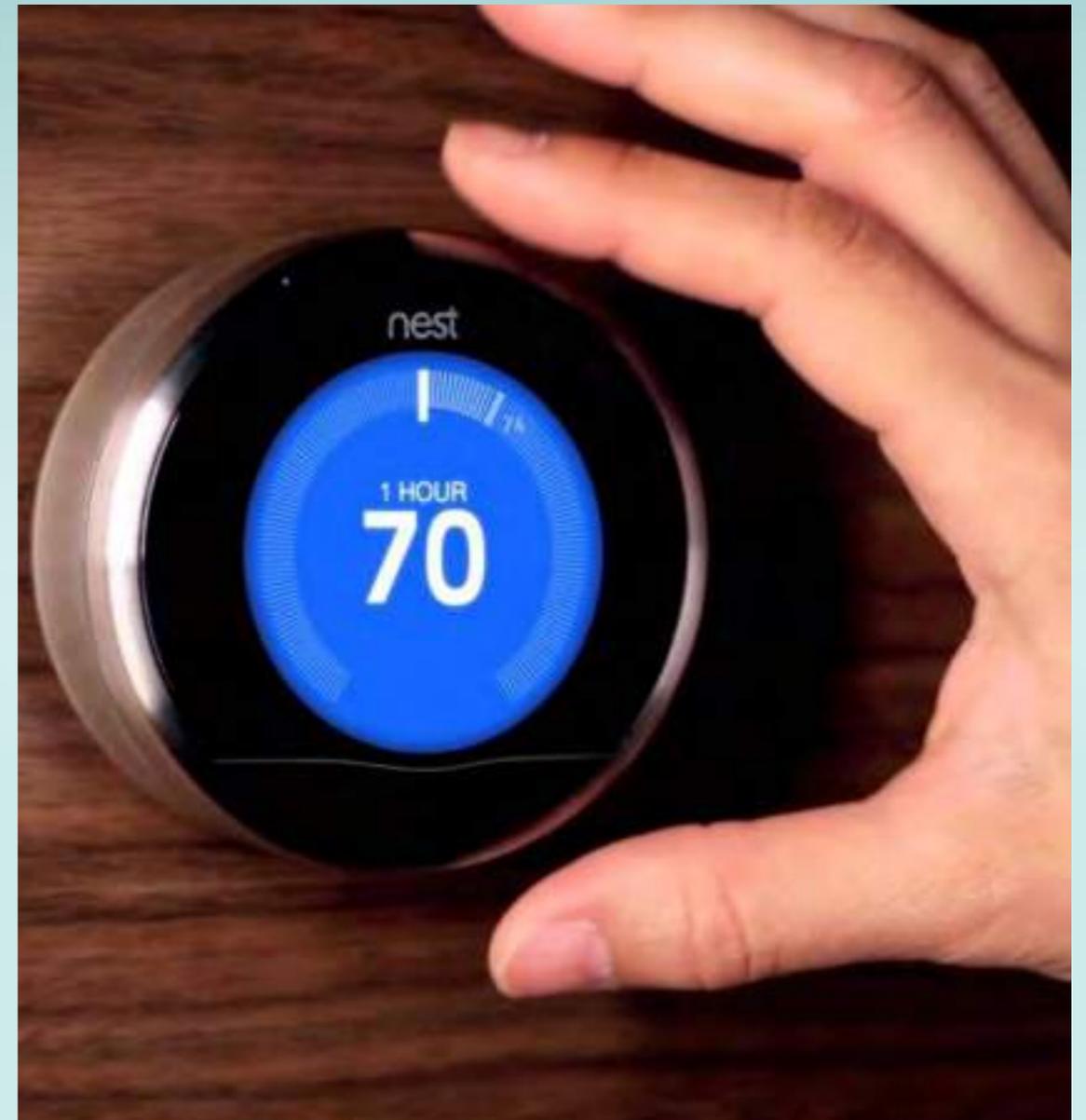
How are museums using novel technologies, analytics, and responsive exhibits to track users, document learning, and improve visitor experiences? Designers and museum experts share stories from research and evaluation, share data, approaches, and technologies that deepen visitors' own interactions with exhibits while also carrying out its organization's education mission.

Session Description

Museums have experimented with various levels of success using technologies like barcodes, eyetracking, RFID, and mobiles to gather information about visitor behaviors and to deepen user experiences. The “smart museum” describes exhibits that collect data about its visitors for institutional purposes, yet also benefit visitors' own learning to further engage them in experimentation, dialogue, and reflection. Cyberlearning technologies can be used to gather data about visitor location, body positions, game play, and choice preferences over repeat visits. Data analytics software and artificial intelligence can process this data to uncover patterns of use. Examples of smart museum work are underway at the Tech Museum of Innovation, the Ann Arbor Hands-on Museum with readers, tablets, and beacons, and in the context of NYSCI's Connected Worlds where logs of students' interactions with the system are being used to extend their experience into their classroom. Each presenter will share a short video and slides with their specific approach, sample data, and technologies used. This is followed by an open Q/A session with attendees to discuss what smart museum technologies can be used for and by whom – whether this is for visitors, classroom teachers on field trips, museum staff, evaluators, or other stakeholders.

SMART

- Technologies that are capable of learning, adapting, and being responsive
- Technologies that record data and communicate that information back to the user, institution, or others.

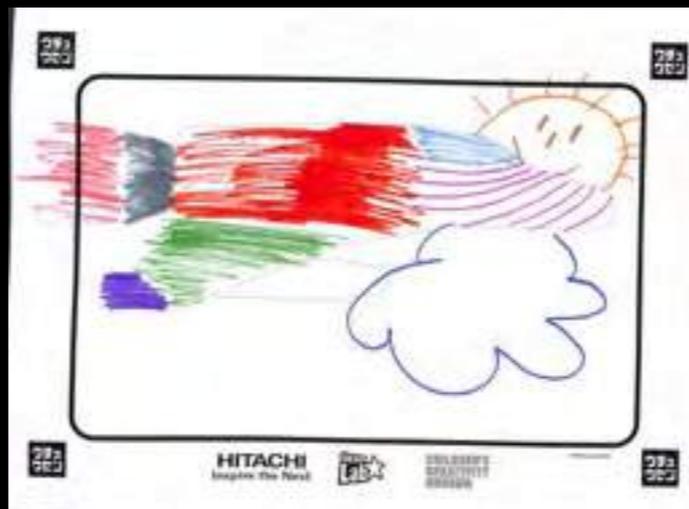


Smart Museums

How are museums using novel technologies, analytics, and responsive exhibits to track users, document learning, and improve visitor experiences?



scan1 10/7/17, 9:49 AM
 scan2 10/7/17, 9:49 AM
 scan3 10/7/17, 9:50 AM
 scan4 10/7/17, 9:50 AM
 scan5 10/7/17, 9:51 AM
 scan6 10/7/17, 9:51 AM
 scan7 10/7/17, 9:58 AM
 scan8 10/7/17, 10:06 AM
 scan9 10/7/17, 10:06 AM
 scan10 10/7/17, 10:13 AM
 scan11 10/7/17, 10:13 AM
 scan12 10/7/17, 10:15 AM
 scan13 10/7/17, 10:15 AM
 scan14 10/7/17, 10:16 AM
 scan15 10/7/17, 10:18 AM
 scan16 10/7/17, 10:18 AM
 scan17 10/7/17, 10:20 AM
 scan18 10/7/17, 10:20 AM
 scan19 10/7/17, 10:21 AM
 scan20 10/7/17, 10:21 AM
 scan21 10/7/17, 10:22 AM
 scan22 10/7/17, 10:22 AM
 scan23 10/7/17, 10:22 AM
 scan24 10/7/17, 10:23 AM
 scan25 10/7/17, 10:24 AM
 scan26 10/7/17, 10:24 AM





Lorrie Beaumont

Ann Arbor Hands-On Museum, Ann Arbor, MI

Andee Rubin

TERC, Cambridge, MA

Leilah Lyons

New York Hall of Science, Queens, NY

Gretchen Walker

The Tech Museum of Innovation, San Jose, CA

Claire Pillsbury

The Exploratorium, San Francisco, CA



DEEP

Digitally Enhanced Exhibit Program

Ann Arbor Hands-On Museum:

- Informal learning experience



Ann Arbor Hands-On Museum:

- Informal learning experience
- STEM-based



Ann Arbor Hands-On Museum:

- Informal learning experience
- STEM-based
- Over 250 exhibits & 40,000 square feet



Ann Arbor Hands-On Museum:

- Informal learning experience
- STEM-based
- Over 250 exhibits in 40,000 square feet
- Classroom, outreach, and distance learning programs



Ann Arbor Hands-On Museum:

- Over 38,000 field trip students annually



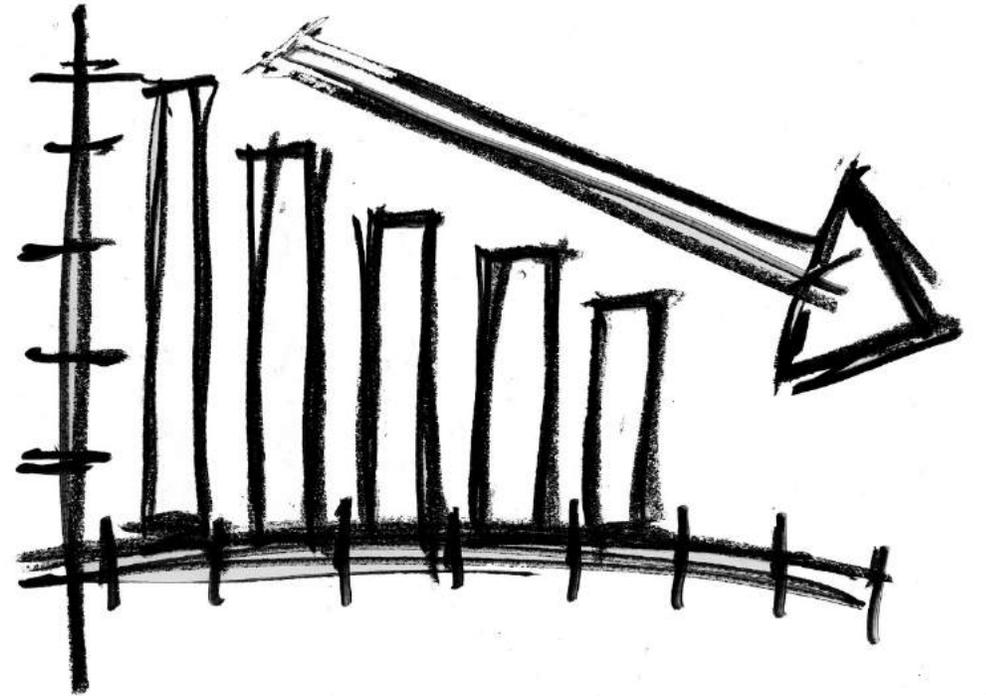
Ann Arbor Hands-On Museum:

- Over 38,000 field trip students
- More than 675 field trip groups each year



The problem

- Field trip attendance has dropped from almost **30% a decade ago**, to around **16% today**.
- Budget-squeezed school districts have reduced field trip spending.



The solution?

- A DEEP field trip to AAHOM exposes students to specific Michigan Science Standards
- These exposures enhance classroom learning, which adheres to the same Michigan Science Standards
- DEEP allows us to provide teachers with quantifiable data
- This data makes a field trip to AAHOM particularly attractive to school administrators who have to make tough decisions about where to spend scarce resources.”

How does it work?

- The Digitally Enhanced Exhibit Program – DEEP – provides the engagement and collects the data to meet the dual needs of elementary educators and Museum staff. Students on field trips interact with tablets placed at key exhibits. Using beacon name badges to automatically log students into the experience at each tablet, the appropriate grade level (or topic or language) experience is served on the screen. Third grade groups see third grade content, fifth graders interact with fifth grade content, and so on. The tablets guide the students through their interaction with the exhibit, offer challenges, ask questions, and spark reflection and application to new situations. All the while, the tablet records the experience, tracking the specific state science curriculum standards to which students are exposed on every screen, every exhibit tablet, by grade level.

- At the end of the field trip, teachers receive detailed reports showing the curriculum standards that were experienced throughout the day. Visits and time spent on popular concepts and popular exhibits are reported before the teacher even gets back on the school bus. Free text and data entered by students at exhibits can be taken back to the classroom for use in other activities. Individual students each receive a personalized report showing the activities they experienced during the day along with their actual answers to questions and challenges posed at each of the exhibits they visited.

- With DEEP, we've flipped the typical use case for beacons. Beacon technologies are used in marketing and other applications, where the beacons are placed throughout a space and users with downloaded smartphone applications and their Bluetooth service activated receive notifications as they approach a beacon. In the Museum's situation, it's completely untenable to hand out smartphones to hundreds of elementary students each day. By mounting the expensive technology securely to the wall and putting a \$5 beacon on the student, the Museum overcomes this barrier.
- The DEEP beacon badges are arranged into classroom groups and assigned to a particular curriculum for the day. Currently the Museum offers 3rd, 4th and 5th grade curricula, with the ability to expand to additional grade levels, languages and related curricula (History of Science, Inventors & Inventions, Art & Design in Technology, etc.). The beacon badges identify the students as they approach DEEP-enabled exhibits so that the right curriculum can be served up to them and so their activities are tracked by the system.
- The goal is for the environment to seamlessly recognize the learner's presence and enough of the right personal information in order to determine what to do next.

654

BLUE BIRD









What do you call this part of the gear?
Look at the gears. What do you think this part of the gear is called?





Ann Arbor H2O2N Museum
D.E.E.P.

Martens

The American Marten is also known as the "Pine Marten" and is in the same group as otters, badgers, weasels, minks, and muskies. This group is called Mustelidae.



Ann Arbor H2O2N Museum
D.E.E.P.

Ann Arbor H2O2N Museum
D.E.E.P.

Eastern Moles



Ann Arbor H2O2N Museum
D.E.E.P.

Gray Squirrel



means they eat meat.

Ann Arbor H2O2N Museum
D.E.E.P.

Black Bear







Robin
5/23/2017

Today at the Ann Arbor Hands-On Museum, you used the Robin badge with our Digitally Enhanced Exhibit Program (DEEP). Use this page to share what you learned with your family and friends.

You visited a total of 7 DEEP exhibits, and you completed 5 of them.

Here's what you did:

- You built a stack blocks high at Block Party!
- At Planetary Gravity, it was easier to lift the astronaut off some of the planets because [Some places have less gravity.](#)
- You said that sending codes in Packet Traffic would be easier if [Ask](#)
- Lyons' Country Store is a general store, just like [A.](#)
- You rolled the ball down the ramp in seconds at Balls & Ramps.



NOW THAT YOU'VE HAD THE D.E.E.P. EXPERIENCE ...

COME ON BACK

10% OFF ADMISSION
WITH THIS COUPON

Keicher Elementary



Dashboard

DEEP

Dashboard

Reservations

Visitors/Groups

Beacons

Exhibits

Reports

Reference

Today's Reservations

Print

Wed Oct 11, 2017

No reservations today.

Activity

Print

October 10, 2017

Exhibit	Launched	Answered	Completed	Total
Geartable	5	19	1	25
Oscylinderscope	7	15	1	23
Infrared	14	41	6	61
Nano	1	3	1	5
Whisper Dishes	1	2	0	3
H2Oht Spoons	2	7	1	10
H2Oht Canals	4	9	1	14
Block Party	7	24	2	33
Packet Traffic	14	36	3	53
H2Oht Pipes	9	29	6	44
Architect	3	2	0	5
Magnetoscope	3	5	0	8
Michigan Basin	1	0	0	1
TOTAL	71	192	21	284

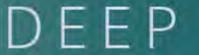
October 9, 2017

Exhibit	Launched	Answered	Completed	Total
Infrared	23	76	16	115
H2Oht Canals	11	27	3	41
Packet Traffic	32	105	9	146
H2Oht Pipes	11	24	3	38
Magnetoscope	4	3	0	7
Oscylinderscope	25	69	4	98
H2Oht Spoons	11	17	0	28
Architect	4	2	0	6
Geartable	13	34	3	50
Block Party	2	25	1	28
Whisper Dishes	4	12	2	18
Nano	4	6	2	12
Michigan Basin	1	0	0	1
TOTAL	150	400	41	591



Reservations

Home / Reservations



Reservations [+ Add New](#)

CURRENT RESERVATIONS **PAST RESERVATIONS**

[Upload/refresh current reservations](#)

Show 10 entries

Search:

Showing 1 to 10 of 33 entries

	Date	Arrive	Depart	Beacon Bundle	School	Teacher	Contact	Grade	Created By	Created Date	Reservation #	Sales #
<input type="checkbox"/> Edit	Tue May 23, 2017	10:00 AM	1:00 PM	Birds	Keicher Elementary	Brianne Sinden	Brianne Sinden	3	DEEP Admin User	Tue May 23, 2017 8:50 AM	00000034	757750
<input type="checkbox"/> Edit	Tue May 23, 2017	10:00 AM	1:00 PM	Mammals	Keicher Elementary	Brianne Sinden	Brianne Sinden	3	DEEP Admin User	Tue May 23, 2017 8:49 AM	00000033	757750
<input type="checkbox"/> Edit	Mon May 15, 2017	9:30 AM	12:00 PM	Mammals	Miller Elementary	Ramona Bridgeman	Ramona Bridgeman	3	DEEP Admin User	Fri May 12, 2017 3:03 PM	00000031	767955
<input type="checkbox"/> Edit	Mon May 15, 2017	9:30 AM	12:00 PM	Birds	Miller Elementary	Ramona Bridgeman	Ramona Bridgeman	3	DEEP Admin User	Fri May 12, 2017 3:04 PM	00000032	767955
<input type="checkbox"/> Edit	Fri May 12, 2017	3:00 PM	4:00 PM	Mammals	Made up school	Matthew Kliewer	Ari Morris	5	DEEP Admin User	Fri May 12, 2017 2:48 PM	00000030	55555
<input type="checkbox"/> Edit	Fri May 12, 2017	2:00 PM	3:00 PM	Birds	Made up school	Paul Drummond	Matt Kliewer	4	DEEP Admin User	Fri May 12, 2017 11:57 AM	00000029	654123
<input type="checkbox"/> Edit	Fri May 12, 2017	12:30 PM	1:30 PM	Mammals	Made up school	Sue McDowell	Ari Morris	5	DEEP Admin User	Fri May 12, 2017 11:56 AM	00000028	12345
<input type="checkbox"/> Edit	Tue Apr 25, 2017	8:00 AM	12:00 AM	Trees	Torrance Learning	Matthew Kliewer	Matt Kliewer	Family	Matt Kliewer	Tue Apr 25, 2017 3:48 PM	00000027	torrancelearning-demo
<input type="checkbox"/> Edit	Wed Mar 29, 2017	2:30 PM	4:00 PM	Birds	Made up school	Matthew Kliewer	Paul Drummond	5	DEEP Admin User	Wed Mar 29, 2017 1:21 PM	00000026	Test
<input type="checkbox"/> Edit	Mon Mar 20, 2017	8:00 AM	8:00 PM	Trees	Torrance Learning	Matthew Kliewer	Perry Samson	3	DEEP Admin User	Mon Mar 20, 2017 12:53 PM	00000023	learning-solutions-01

Previous 1 2 3 4 Next



Report Stream

STREAM	CLICK TO VIEW/SAVE	MATCH-REFRESH	RELOAD STREAM
Student answered Packet Traffic (Grade Family) Question 8 No	4 minutes ago		
Student answered Packet Traffic (Grade Family) Question 6 The balls traveled too slowly. It wasn't hard	4 minutes ago		
Student answered Packet Traffic (Grade Family) Question 5 Yes	4 minutes ago		
Student answered Packet Traffic (Grade Family) Question 3 I didn't know what the code meant	4 minutes ago		
Student answered Packet Traffic (Grade Family) Question 1 Smiley Face, Stop Sign, Internet Slang	4 minutes ago		
Student launched Packet Traffic (Grade Family)	4 minutes ago		
Student answered Michigan Basin (Grade 5) Question 5 Yes	7 minutes ago		
Student launched Michigan Basin (Grade 5)	7 minutes ago		
Student answered Geartable (Grade 4) Question 11 1	9 minutes ago		
Student answered Geartable (Grade 4) Question 10 7	9 minutes ago		
Student answered Geartable (Grade 4) Question 7 Clockwise	9 minutes ago		
Student answered Geartable (Grade 4) Question 6 Counter Clockwise	9 minutes ago		
Student answered Geartable (Grade 4) Question 4 Both gears turned the same number of times.	9 minutes ago		
Student answered Geartable (Grade 4) Question 1 Teeth	9 minutes ago		
Student launched Geartable (Grade 4)	9 minutes ago		
Student answered Packet Traffic (Grade Family) Question 3 I didn't know what the code meant	16 minutes ago		
Student answered Packet Traffic (Grade Family) Question 1 Internet Slang	16 minutes ago		
Student launched Packet Traffic (Grade Family)	16 minutes ago		
Student answered Packet Traffic (Grade 5) Question 1 Numbers	16 minutes ago		
Student launched Packet Traffic (Grade 5)	16 minutes ago		

+ Get More Statements



Individual Beacons

Home | Beacons | Individual Beacons

Individual Beacons [+ Add to Bundle](#) (Select Beacons from list)

Show 25 entries

Filter by Bundle: **Mammals** Trees Birds Scientists Search

Showing 1 to 25 of 84 entries

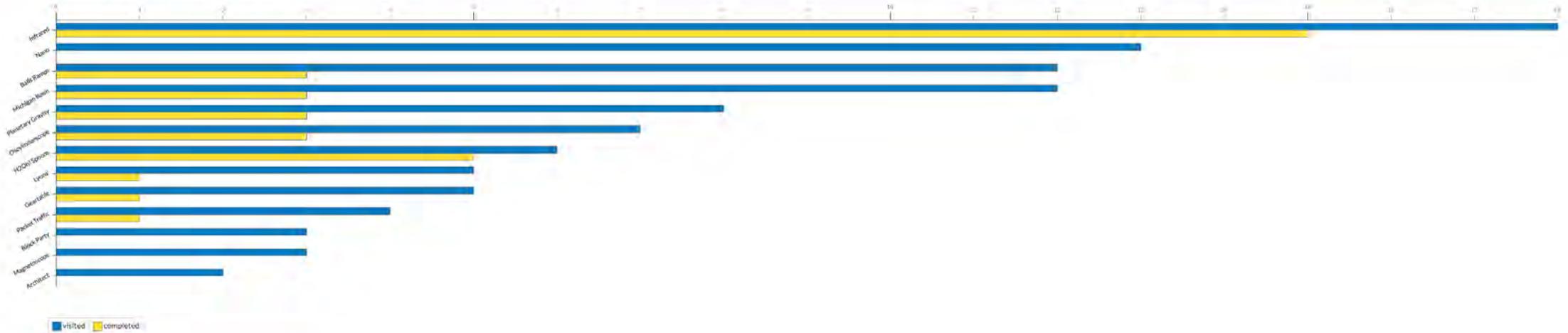
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name	Factory ID	Bundle	Battery
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Alan Turing	HGWY-9PMW2	Scientists	Med-LOW
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	American Basswood	MTRN-82FTV	Trees	High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	American Bittern	A745-1MBVU	Birds	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Anna Botsford Comstock	56CV-SQUZZ	Scientists	Low
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Badger	631B-YQHPX	Mammals	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Bald Eagle	AKTY-F5RCY	Birds	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Balsam Poplar	JJY7-SNRBX	Trees	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Beaver	84E3-V499A	Mammals	Low
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Beech	ZEVN-P31GY	Trees	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Big Brown Bat	CF6N-Y5G29	Mammals	Med-LOW
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Black Ash	FWAJ-SAZWH	Trees	Med-LOW
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Black Bear	KSQV-FR56N	Mammals	Low
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Black Maple	65J4-G7S8E	Trees	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Black Tern	UZKS-HZNZ5	Birds	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Black-backed Woodpecker	QFP2-FC8TS	Birds	Med-LOW
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Bobcat	KR7V-ZGG8K	Mammals	Med-High
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Broad-winged Hawk	fev8-g5fcp	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Brown Rat	UKEX-TEHAX	Mammals	Med-LOW
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Brown-headed Cowbird	vgrmv-v2783	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Common Loon	2q2s-r54c2	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Common Crow	66v9-n8n65	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Common Loon	Arb8-8ta2t	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Common Raven	umiqq-q7aa4	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Common Tern	p4bb-gm87r	Birds	Unknown
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="radio"/>	Cougar	NNFQ-SB2RC	Mammals	Med-LOW



Digitally Enhanced Exhibit Program (DEEP)

Keicher Elementary; Brienne Sinder
Report Date: 10/11/2017, 11:56:03 AM

How many students visited each exhibit?



Which exhibits were launched most frequently?

Infrared	27 total launches
Nano	12 total launches
Michigan Basin	10 total launches
Balls Ramps	8 total launches
H2Oh! Spoons	7 total launches
Geartable	6 total launches
Packet Traffic	5 total launches
Lyons'	3 total launches
Oscylinderscope	3 total launches
Magnetoscope	3 total launches
Planetary Gravity	3 total launches
Block Party	2 total launches
Architect	1 total launches

Visited Standards

How were each of the standards experienced by the students?

Standard	Exhibit	Exposures	Students
4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	123	18
	Infrared	123	18
4-PS3-3	Ask questions and predict outcomes about the changes in energy that occur when objects collide.	167	19
	Infrared	123	18
	H2O! Spoons	44	6
4-LS1-1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	123	18
	Infrared	123	18
4-LS1-2	Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	123	18
	Infrared	123	18
CCC-1	Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them.	184	20
	Infrared	123	18
	H2O! Spoons	44	6
	Packet Traffic	17	4
CCC-2	Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given contexts and used to predict and explain events in new contexts.	167	19
	Infrared	123	18
	H2O! Spoons	44	6
3-5-ETS1-1	Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	85	16
	Balls Ramps	35	12
	GearTable	27	5
	Block Party	21	3
	Architect	2	2
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	102	16
	Balls Ramps	35	12
	GearTable	27	5
	Packet Traffic	17	4
	Block Party	21	3
	Architect	2	2

WHAT HAPPENED?

Creating automatic recaps for complicated simulations using log files

Andee Rubin, TERC

Leilah Lyons, New York Hall of Science, UIC



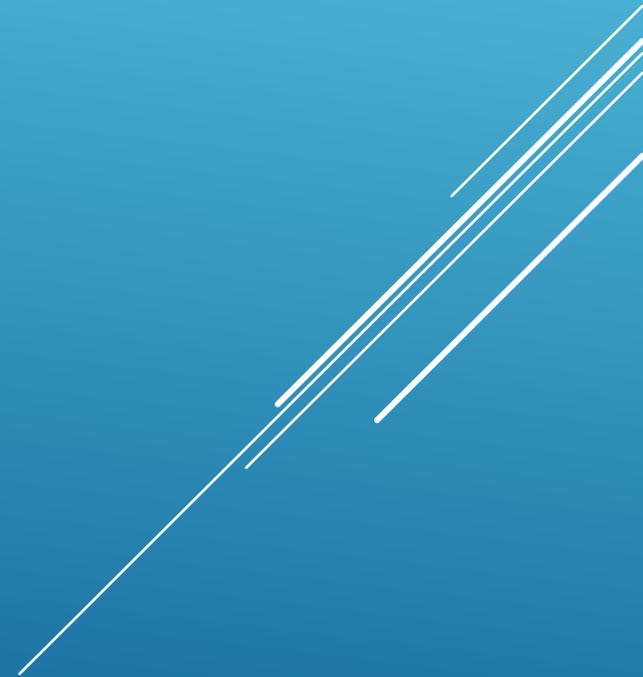
CONNECTED WORLDS



PLANTING SEEDS



CONTROLLING WATER FLOW





AMAZING PLANTS AND ANIMALS EMERGE AS LONG AS CONDITIONS ARE RIGHT



WHAT HAPPENED?: GLOBAL VIEW

WHAT WOULD BE MORE HELPFUL?

- Selective recap of what happened.
- A recap that highlights cause and effect (“causal chains”)
- A recap that illustrates characteristics of complex systems
- A recap that builds on salient events or changes that visitors are likely to remember
- Discussion prompts for the teacher



HOW IS THIS DIFFERENT? (from other log file uses)

- Captures the activity of the group, not individuals.
 - Makes use of the teacher's expertise in leading discussions.
 - Is explicitly for enhancing visitor experience, not assessment or audience research.
- 

HOW ARE WE GETTING THERE AND WHAT
OBSTACLES HAVE WE ENCOUNTERED?

Turning it over to Leilah...

A decorative graphic consisting of several parallel white lines of varying lengths, slanted upwards from left to right, located in the bottom right corner of the slide.

What visitors do
(**action logs**)



vs.



What is *happening*
(**state logs**)

Give a picture of *learners*

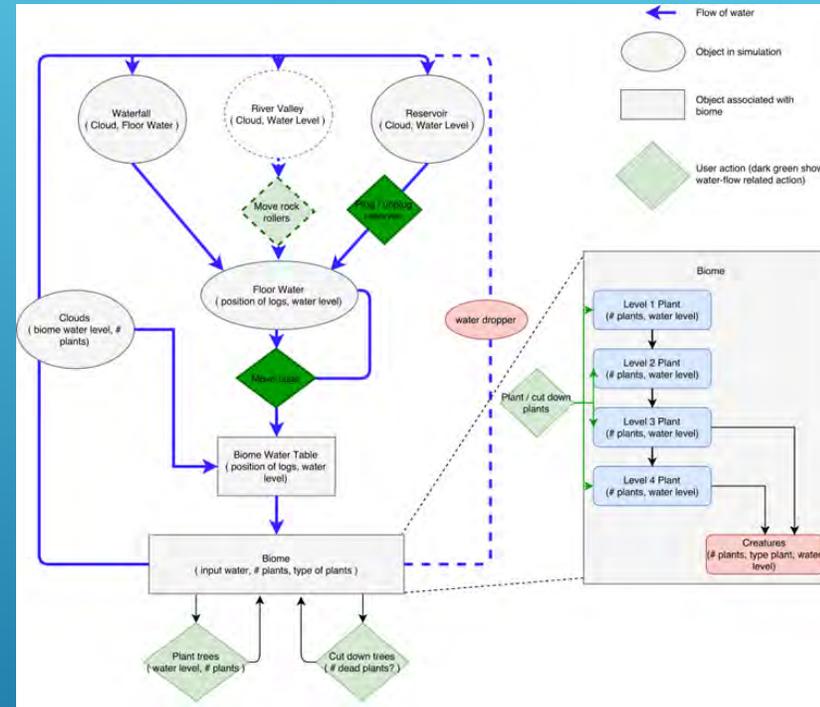
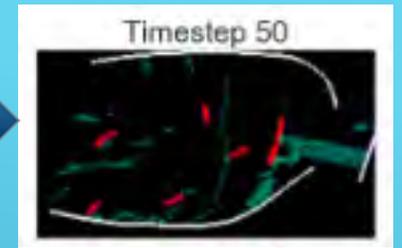
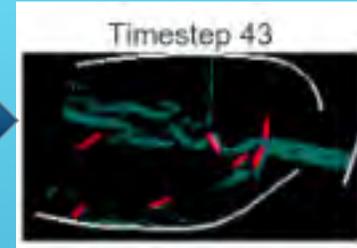
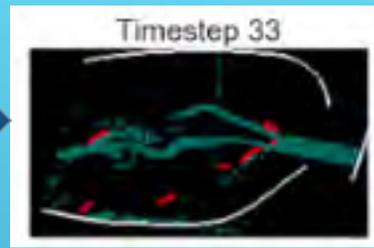
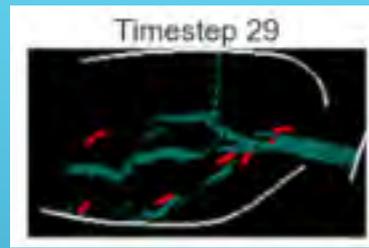
- Akin to timing and tracking
- May be of more interest to evaluators
- Supports metrics tied to *individuals*
 - Degree of engagement
 - Can be used to build “profiles” of types of users
 - E.g., browser vs. deep-diver

Give a picture of *context* of learning

- Akin to website use statistics
- May be of more interest to designers
- Supports metrics tied to *content*
 - Which parts of experience were “visited”
 - Most popular states
 - States that users seldom reach

WHAT YOU RECORD SHAPES
WHAT YOU CAN EXAMINE

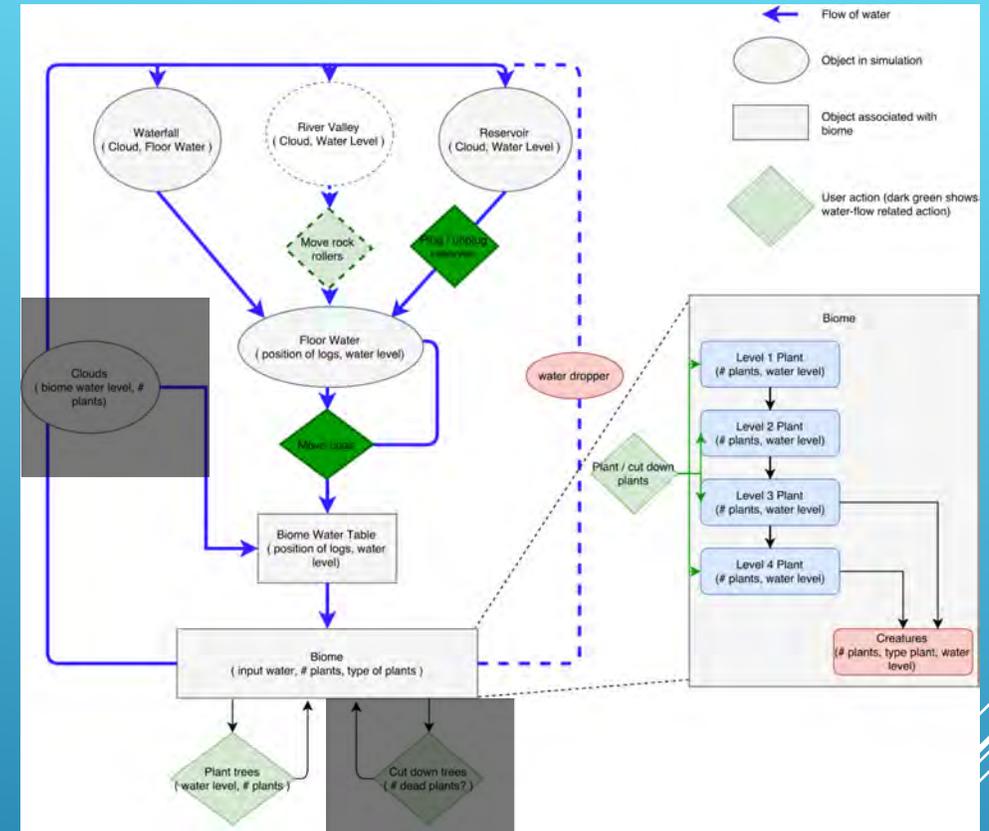
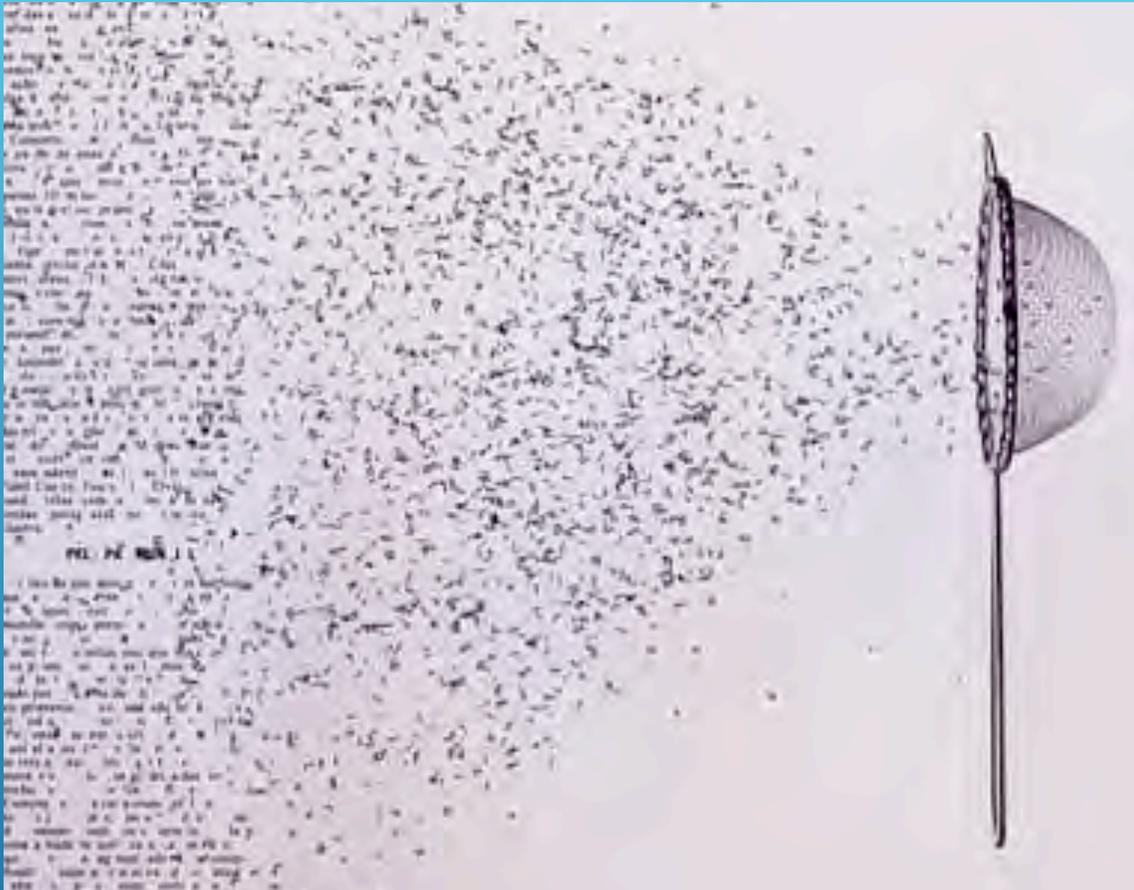
For researchers, having
both actions and states
is most helpful



HOW DID *THAT* HAPPEN?

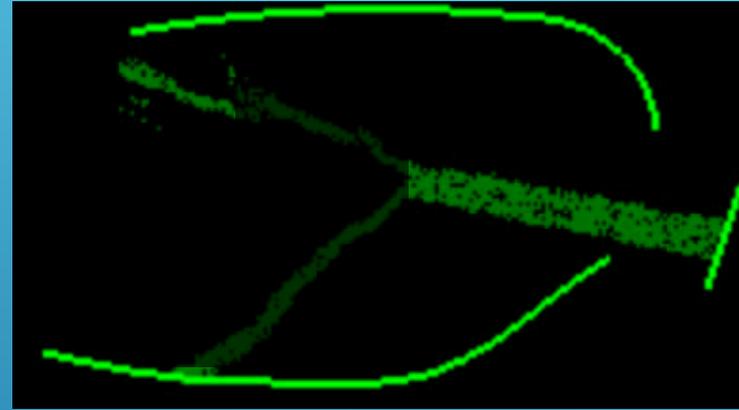
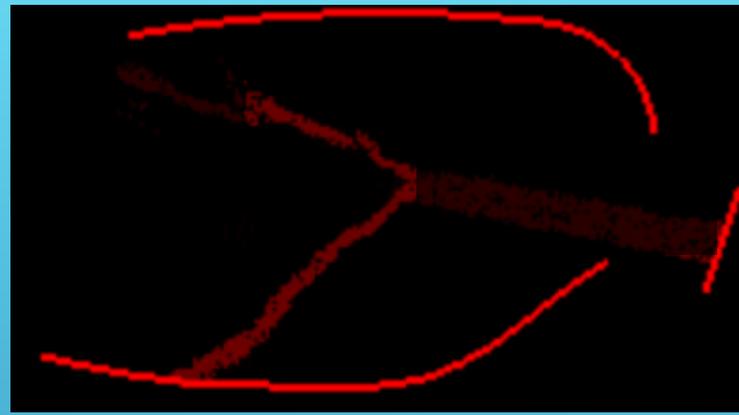
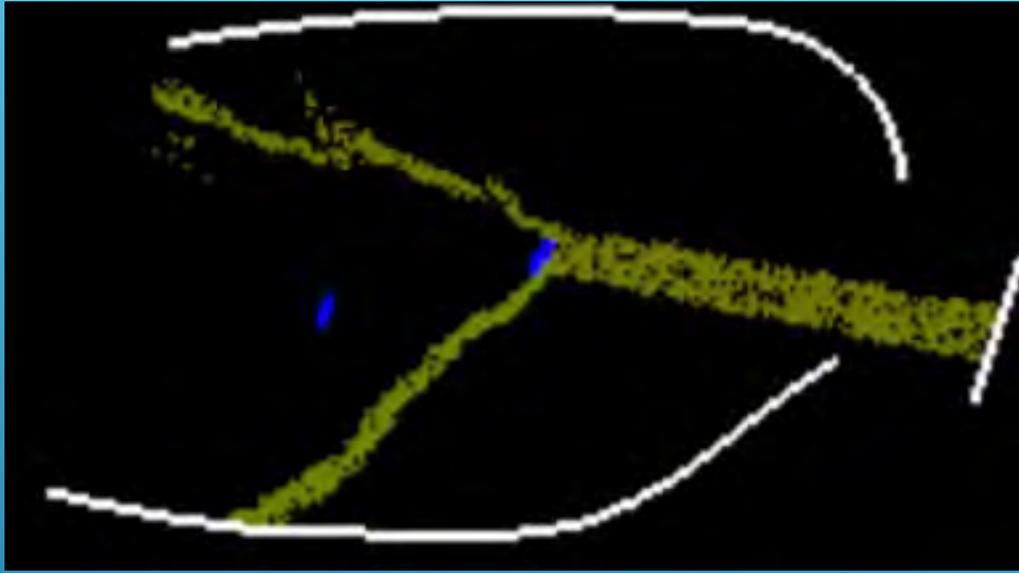
Inferring actions in Connected Worlds

System diagram linking user actions to system states

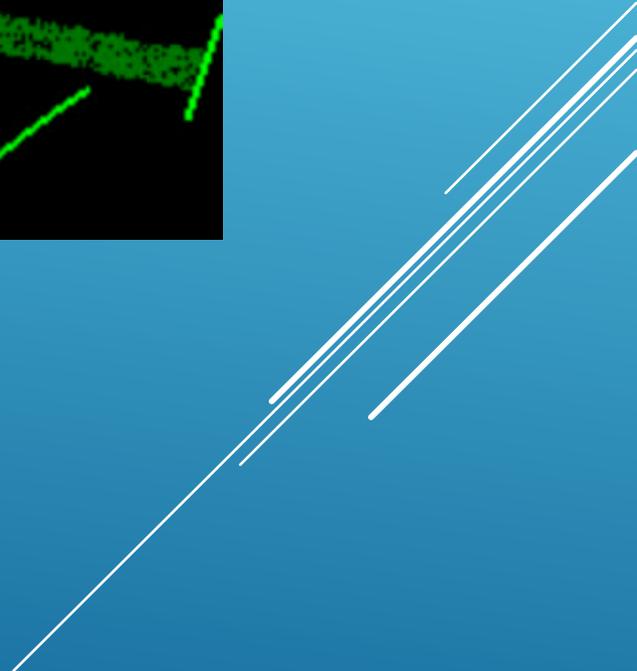


THE CURSE OF
“PERFECT INFORMATION”

Can do a
“**cognitive walkthrough**”
to decide which aspects of
state users will attend to



WHEN LARGE DATA IS INEVITABLE:
EXPLOITING DATA STORAGE TRICKS



- ▶ Getting “*all* the data” is not the answer
- ▶ Getting the *right* data should be the focus
- ▶ And the right data – *for whom* – is the question
 - ▶ Who is the audience for this information?
 - ▶ Are we targeting formative improvements?
 - ▶ Summative evaluations?
 - ▶ Learning research?
- ▶ Designing a log file structure to meet all stakeholders’ needs, so negotiation will be require

RICH LEARNING EXPERIENCES DEMAND
RICH, BUT STRATEGIC, DOCUMENTATION



The Tech
Museum of Innovation

Gretchen Walker
*Smart Museum: Novel Technologies
for Enhancing Exhibits and Visitor
Learning*
ASTC 2017

Smart Museum: The Power of Barcodes

How to use your Tech Tag



Connect

Get your Tech Tag, free with admission, to unlock and personalize your visit to the museum.



Collect

Gather digital mementos as you explore exhibits, learn, collaborate, play games and participate in challenges.



Reflect

Track your activity online, share your achievements, learn more about our exhibits and plan your next visit.

Tech Tags: Seeing things at home later



Tech Tags: Connecting Experiences



Tech Tags: Connecting Experiences 2



CYBER DETECTIVES
presented by **paloalto**

Congratulations!
You've received the
Password Strength
and Cracker Tool!

Visited [Hashing and Cracking](#) .
11.07.15



Upside of Tech Tags

Good user analytics for us!

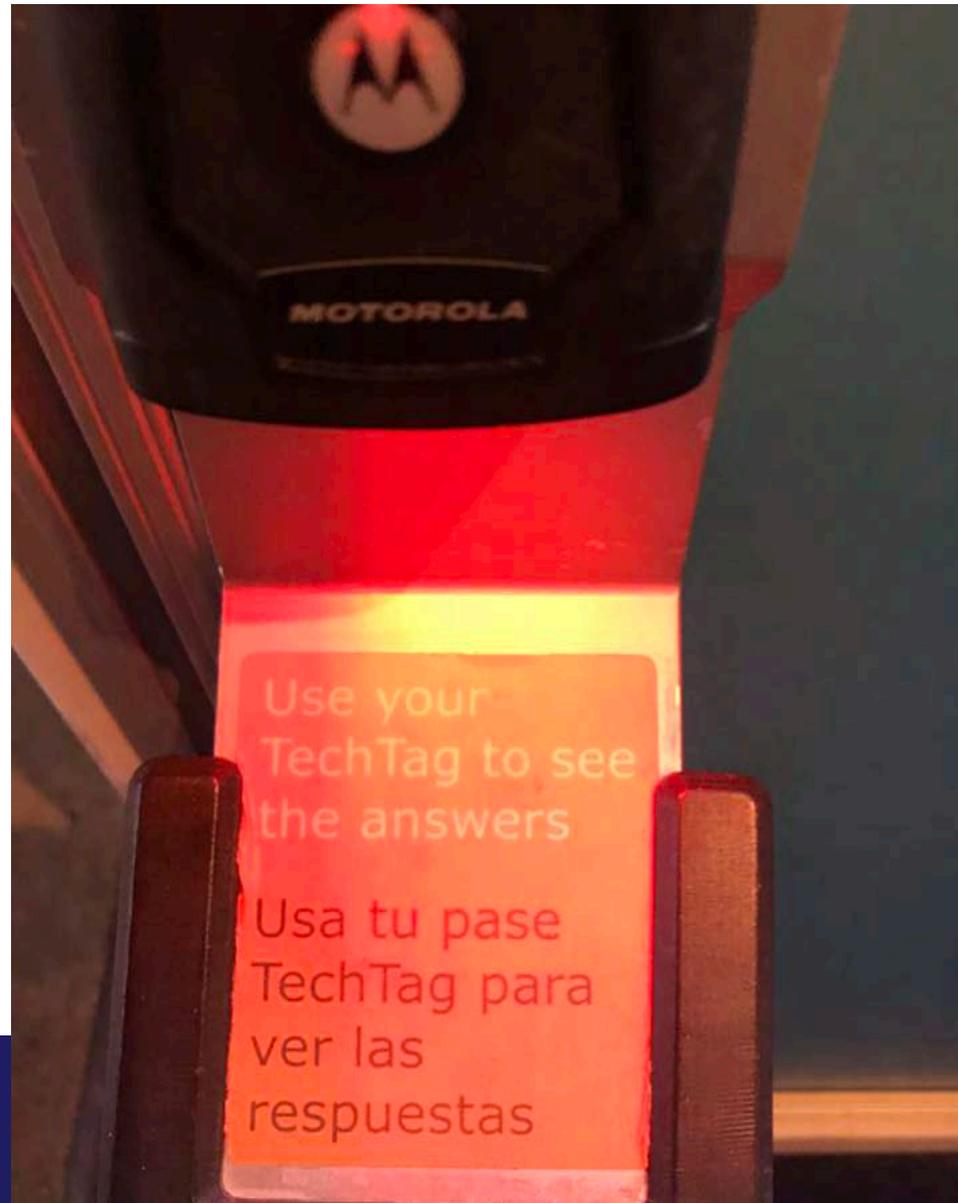
- Dwell time
- Top usage by number
- Exhibits that time out vs visitor gets to conclusion
- Helps us acknowledge blind spots

Average Time by Location (sec)
Friday, July 01, 2016 to Tuesday, February 28, 2017
(2776.8534 ms)

<u>LocationName</u>	<u>Average</u>
Living Colors Lab	792
Creature Creation Station	704
Van	669
Net Builder	392
Cyber Forensics	257
Pleo Interactive	243
BioFutures	214
Cryptography	207
Pattern Design	205
Spam and Scam	145
Hashing and Cracking	142
Sensing with a Sniff	126



Downside of Tech Tags



Motivation to Change Clarity Around Experience Goals.....



Motivation to Change

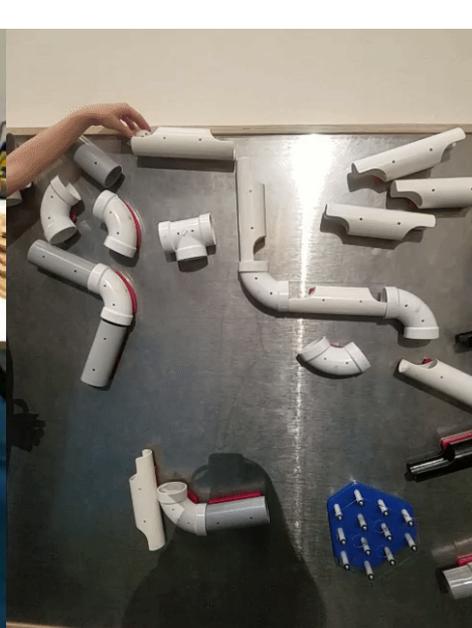
....shifts the kind of data we're looking for

- **Inspiration:** We seek to inspire! Key Indicators: Express joy/excitement/amazement in something they've experienced, acknowledge they now see something differently, express they want to try something new or have ideas about something that they might want to do next as a result of their experience.
- **Identity/Ability** - We want people to get practice in creative problem solving, and see themselves as creative problem solvers/innovators. Key Indicators: While at the Tech, can we see people engaging in creative problem solving? Do visitors see themselves as people who can engage in creative problem solving?
- **Iteration/Persistence**- We want people to develop the discipline to try something more than once - to pick up on the key skill of improving a design after testing, sticking with hard problem, etc

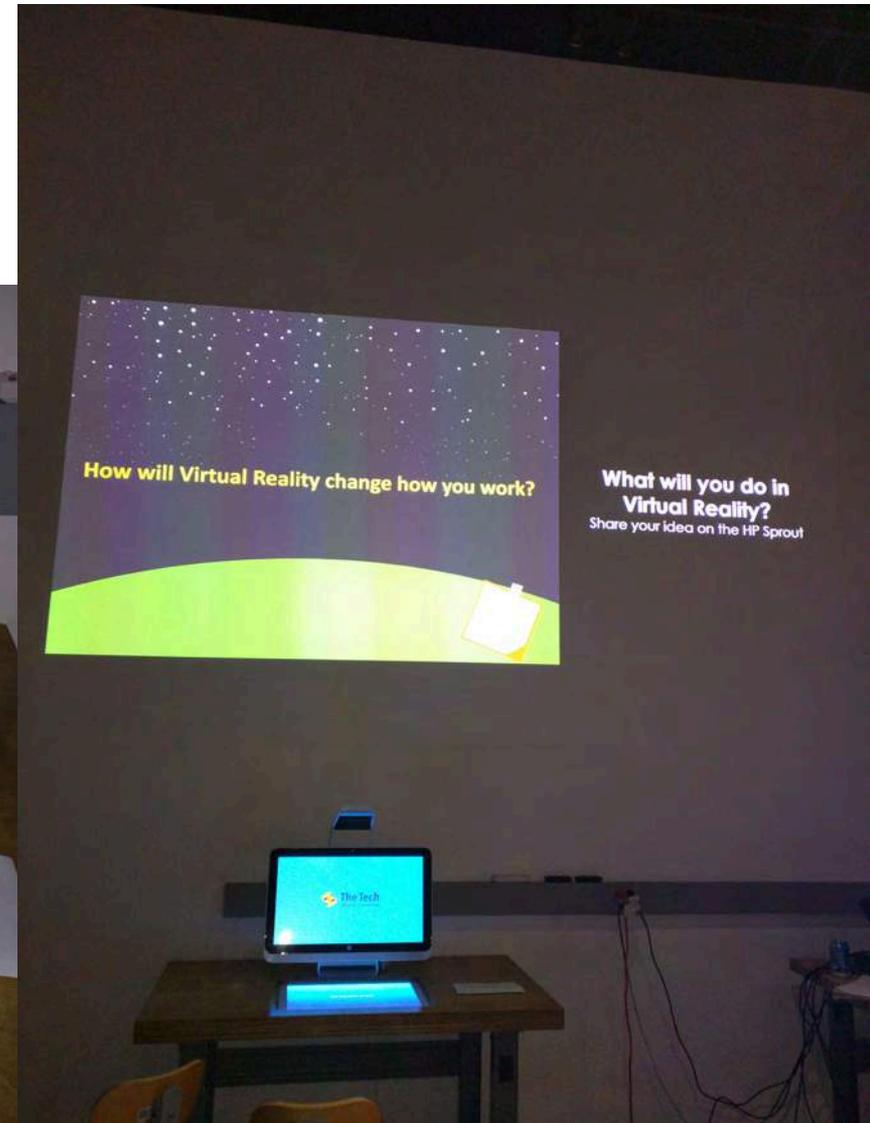


Alternative Strategy 1: App-based Scavenger Hunt





Alternative Strategy 2: HP Sprout Station





What's Next for Smart Museum 2.0?

- **More experimenting with prompts** – What questions will work the best to spark people sharing what they've taken in around them and how they problem solve using the technology we're asking them to share with
- **Pairing observations and interviews with analysis of artifacts** – can we find enough consistency to mean we can continue to conduct analysis from artifacts alone?

Want to share ideas? Hear what happens once we do more analysis? Share thought that might help point me in a productive direction?

Gretchen Walker – gwalker@thetech.org

