

TimeLineCurator

Interactive Authoring of Visual Timelines from Unstructured Text

The screenshot displays the TimeLineCurator v0.3 interface. At the top, a visual timeline shows various events represented by colored dots and arrows along a horizontal axis from 1960 to 2010. Below the timeline are three main panels:

- List View:** A list of events with checkboxes and status icons. The selected event is "1978 Punk hits Denmark".
- Document View:** A text snippet from a document with the selected event highlighted. The text is: "to electric rock/new wave in the eighties. Also in his entourage Sorensen is active as female vocalist. Punk hit Denmark in 1978 with political outspoken bands like Malurt (with singer Michael Falch going solo a decade later). The definite breakthrough of Anne Linnet comes when she turns to new wave in the eighties. Forming the Anne".
- Control Panel:** A panel for editing the selected event. It shows the year "1978", a title field containing "Punk hits Denmark", and a content field containing "Punk hit Denmark in 1978 with political outspoken bands like Malurt (with singer Michael Falch going solo a decade later)". There is also a "Track" section with colored buttons (1-6) and a "Has Media" checkbox with a cat icon.

At the bottom left, it says "Events: 92, vague expressions: 10". At the bottom right, it says "17 temporal expressions in this doc" and "About & Help".

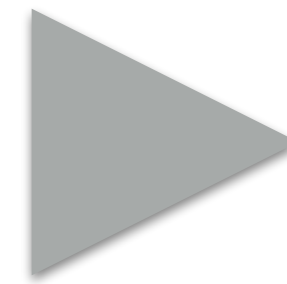
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University of British Columbia & University of Munich (LMU)



Setting the stage

- Experience creating infographics in newsroom
- **Timelines** are popular, but tedious to create
- How could we make that easier?

Introducing **TimeLineCurator**



Video:
vimeo.com/jofu/tlc

Creating Timelines

2 common approaches

- **Manual creation**

Creating **static timelines**, e.g. for print

- **Structured creation**

Creating **interactive timelines**, e.g. for online use

5 tasks to go through

Browse

Extract

Format

Show

Update

Manual creation process



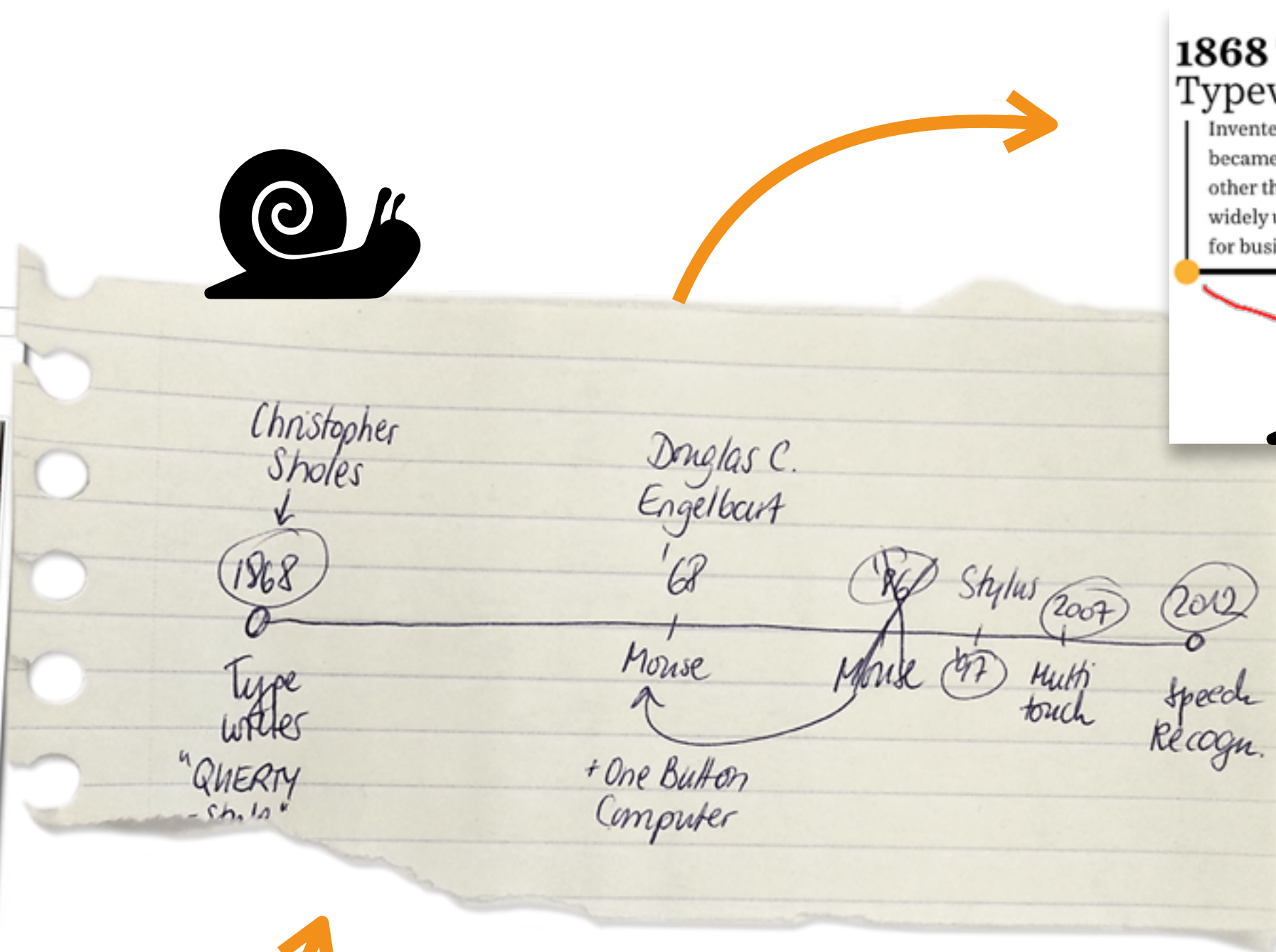
Early mouse patents. From left to right: Opposing track wheels by Engelbart, Nov. 1970, U.S. Patent 3,541,541; Ball and wheel by Rider, Sept. 1974, U.S. Patent 3,835,464; Ball and two rollers with spring by Opocensky, Oct. 1976, U.S. Patent 3,911,411.

Mighty Mouse
In 1980, Apple Computer asked a group of guys fresh from Stanford's product design program to take a \$400 device and make it mass-producible, reliable and cheap.
Their work transformed personal computing.

By Alex Soojung-Kim Pang
Dean Hovey was hungry. His young industrial design firm, Hovey-Kelley Design, had been working on projects for Apple Computer for a couple of years but wanted to develop entire products, not just casings and keyboards. Hovey came to pitch Apple co-founder Steven Jobs some ideas. But before he could get started, the legendary high-tech pioneer interrupted him. "Stop, Dean," Hovey recalls Jobs saying. "What you guys need to do, what we need to do together, is build a mouse."

Hovey was dumbfounded. A what? Jobs told him about an amazing computer, code-named Alto, he had just seen at Xerox's Palo Alto Research Center (PARC). In early 1980, most computers (including Apple's) required users to memorize text commands to perform tasks. The Alto had a graphical user interface—a symbolic world with little pictures of folders, documents and other icons—that users navigated with a handheld input device called a mouse. Jobs explained that Apple was working on two computers, named Lisa and Macintosh, that would bring that technology to market. The mouse would help revolutionize computers, making them more accessible to ordinary people. "When I walked out that door," recalls Hovey, "MS '85, I was ready to change the world."

Just one problem: a commercial mouse based on the Xerox technology cost \$400, malfunctioned regularly and was nearly impossible to clean. That device—a descendant of the original computer mouse invented by Douglas Engelbart at the Stanford Research Institute in the early 1960s—was a masterpiece of high-concept technology, but a hopeless product. Jobs wanted a mouse that could be used for \$10 to \$35, survive everyday use and work on his jeans. "We had to make it work on his diet," says Jim Sachs, a



1868 The Typewriter
Invented by Christopher Sholes, typewriters quickly became indispensable tools for practically all writing other than personal correspondence. They were widely used by professional writers, in offices, and for business correspondence in private homes.

1986 The Mouse
Some additional information here

1987 Stylus

1997 The Stylus
a small pen-shaped instrument that is used to a computer screen, mobile device or graphics tablet

2007 Multi Touch
With the start of iPhones Multi-touch became a thing

2012 Speech Recognition

2012 3D Touch
has to be mentioned here, since it's the new shit

Structured creation process



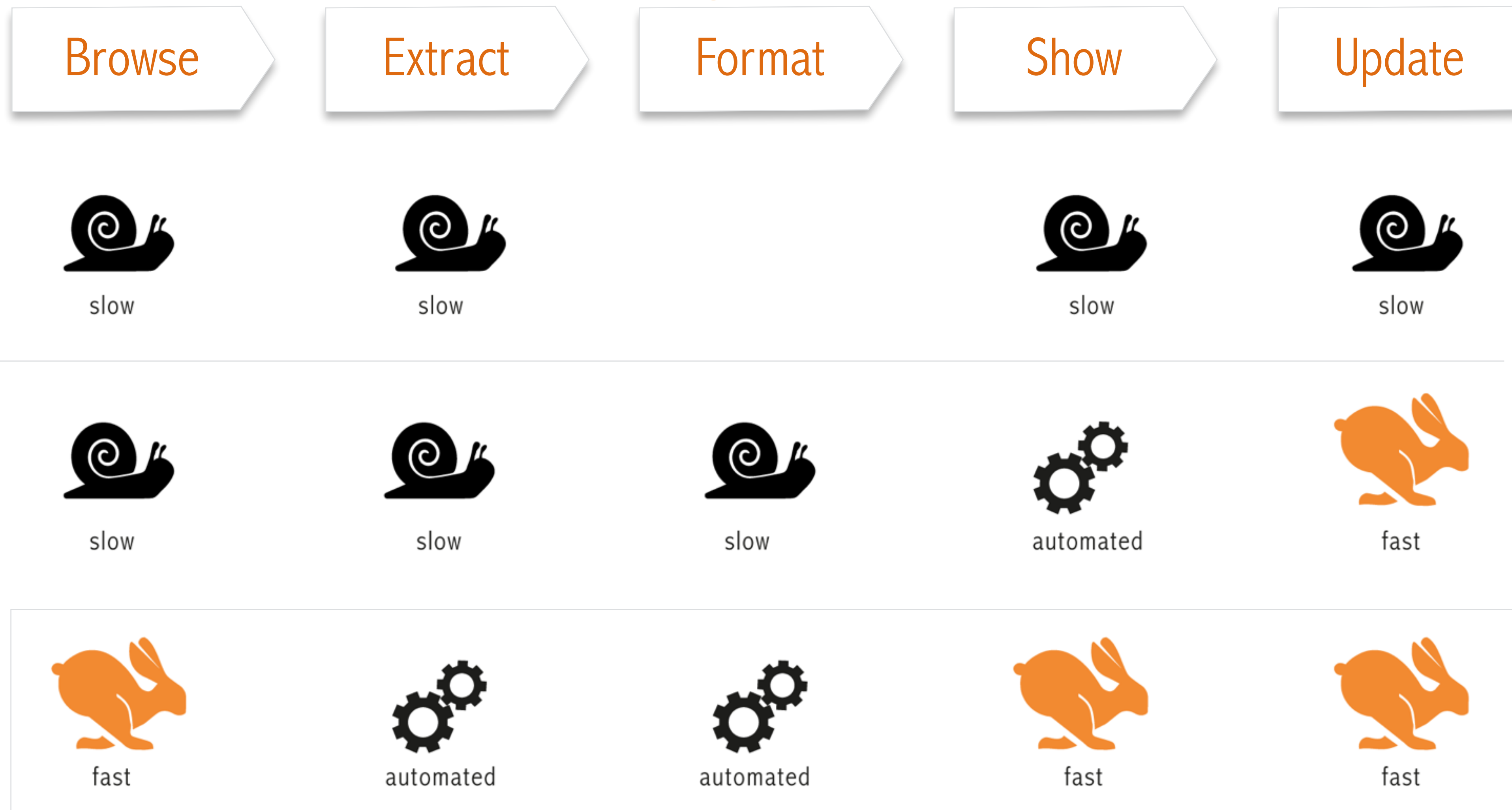
	A	B	C	D	E	F	G	H	I
	Start Date	End Date	Headline	Text	Media	Media Credit	Media Caption	Media Thumbnail	Type
1				Zuckerberg wrote a program called Facemash on October 28, 2003 while attending Harvard as a sophomore	http://dublindigital.ie/wp-content/uploads/2011/02/facemash-700x299.jpg	Dublin Digital	Original Mark Zuckerberg Drunken Blog Posts from the night of Facemash		
2	10/28/2003		Facemash	The following semester, Zuckerberg began writing code for a new website in January 2004					
3	1/1/2004		new website	On February 4, 2004, Zuckerberg launched "Thefacebook", originally located at thefacebook.com					
4	2/4/2004		thefacebook.com	Six days after the site launched, three Harvard seniors (Cameron Winklevoss, Tyler Winklevoss, and Divya Narendra) accused Zuckerberg of intentionally misleading them into believing he would help them build a social network called HarvardConnection.com	http://www.capitalberg.com/wp-content/uploads/2015/05/Harvard-wider.jpg	Capital Berg	A new scandal has recently emerged in connection to the affairs going on at Harvard.		
5	2/10/2004		Harvard Connection accusations	They later filed a lawsuit against Zuckerberg, subsequently settling in 2008[17] for 1.2 million shares (worth \$300 million at Facebook's IPO)	http://4.bp.blogspot.com/-KM6s4_O3yys/VVS335_YFsl/AAAAAAAAATs/bf5XoqfQ3TA/s1600/5.jpeg	Easymese	A lawsuit is filed in 2008.		
6	1/1/2008	12/31/2008	Harvard Connection settles	Membership was initially restricted to students of Harvard College; within the first month, more than half the undergraduates at Harvard were registered on the service					
7	2/4/2004	3/4/2004	Facebook at Harvard only	In March 2004, Facebook expanded to the universities of Columbia, Stanford, and Yale.[20]					
8	3/1/2004	3/31/2004	thefacebook expands to other universities	In mid-2004, entrepreneur Sean Parker (an informal advisor to					



TimelineJS

timeline.knightlab.com/

Timeline Authoring Model time required for each task



Previous Work

LeadLine, Jigsaw

e.g. TERNIP



Unstructured Text



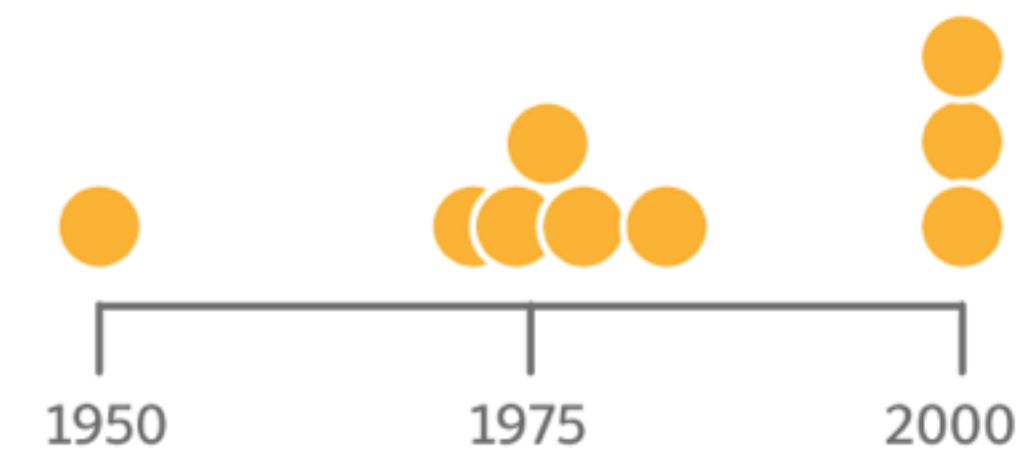
LifeLines, Google News Timeline, TimelineJS

col1	col2	col3
50	birth	some more text
65	graduation	that belongs
74	first job	to the topic and
76	next job	was curated
80	discovery	very carefully to
90	nobel prize	give a lot of info

Structured Data



Tableau, Lyra

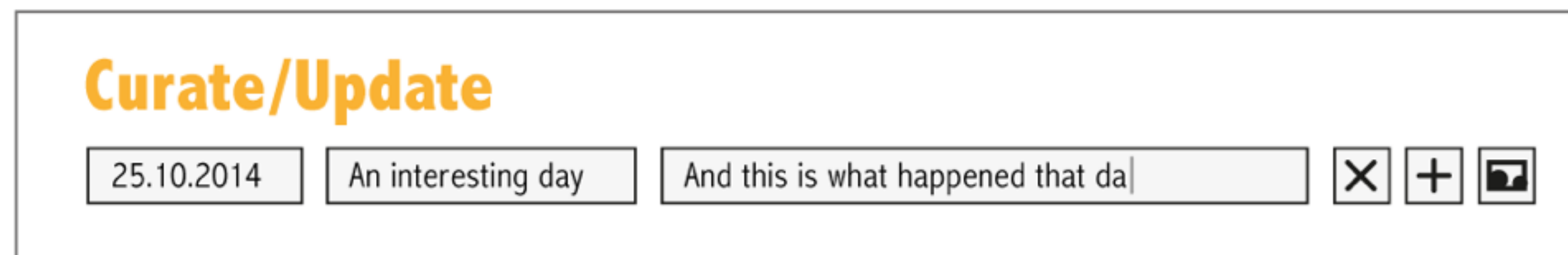
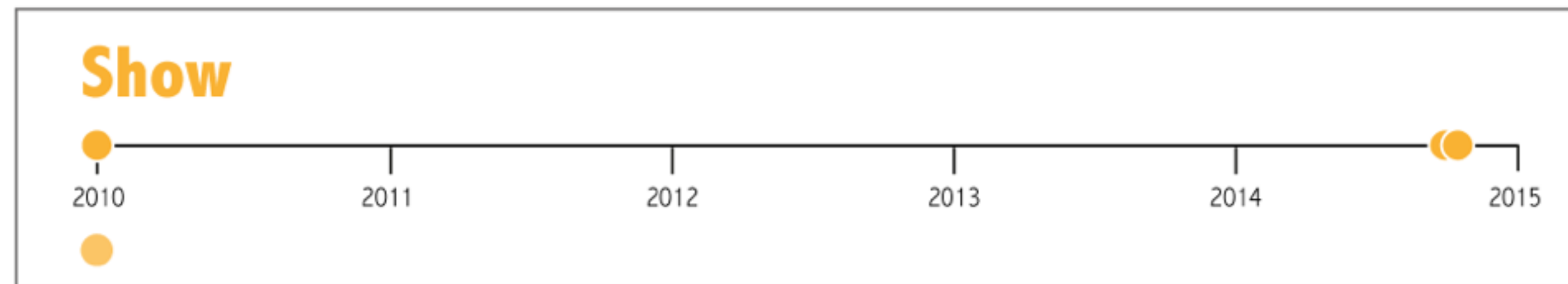
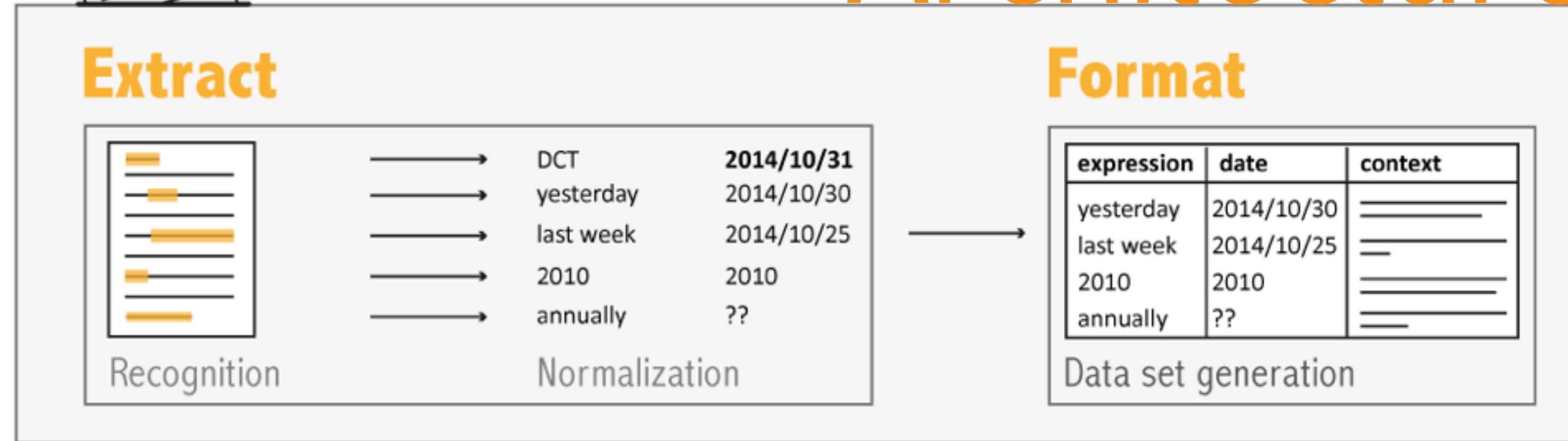


Vis Authoring Tools

TimeLineCurator



Architecture



Validation

- **“Into the wild” feedback**

- Used for actual projects

Deaf churches in England, company profile

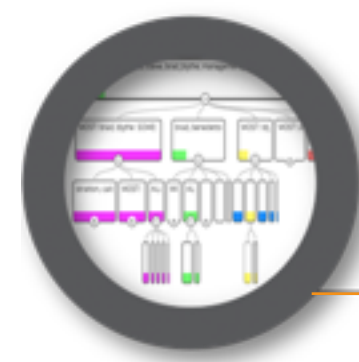
- Promoted by Nick Diakopoulos at NICAR15

- Mentioned in „Making Timelines“ from Lena Groeger (ProPublica)

- **Ideas for further development**

- NLP-related: *Including B.C. dates, Including other languages*

- Integration with existing tools and workflows: e.g. *Overview*



overview for analyzing large sets of documents: www.overviewdocs.com

The screenshot displays the Overview Plugin interface. On the left, a 'TimeLineCurator' view shows a timeline from 1980 to 2016 with various events marked by colored dots and horizontal bars. Below the timeline is a 'List View' with a table of events:

Year	Event
1268—1271	Human Factors in Computing Systems
1979	Pixar's early history Pixar was
1982	In 1982, the team began
1983	A factor contributing to Lucas'
Feb 1986	After years of research, and
1990 – 2000	RenderMan was one of the
1990 – 2000	During the 1990s and 2000s,
Apr 1990	In April 1990 Pixar sold
1991	As 1991 began, however, the
29 Nov 1995	Toy Story went on to
1996	Human Factors in Computing Systems
2000	for Computational Linguistics (ACL), pages

Below the list, it shows 'Events: 77, vague expressions: 15'. The right side of the interface shows a detailed view of a document titled 'pixar.pdf' from 1983. The document text includes:

A factor contributing to Lucas' sale was an increase in cash flow difficulties following his 1983 divorce, which coincided with the sudden dropoff in revenues from *Star Wars* licenses following the release of *Return of the Jedi*. The newly independent company was headed by Dr. Edwin Catmull as President and Dr. Alvy Ray Smith as Executive Vice President. They were joined on the Board of Directors by Steve Jobs as Chairman.¹¹

Initially, Pixar was a high-end computer hardware company whose core product was the *Pixar Image Computer*, a system primarily sold to government agencies and the medical community. One of the buyers of Pixar Image Computers was *Walt Disney Studios*, which was using it as part of their secretive *CAPS* project, using the machine and custom software written by Pixar to migrate the laborious ink and paint part of the 2-D animation process to a more automated method. The Image Computer never sold well.¹⁰ In a bid to drive sales of the system, Pixar employee *John Lasseter*—who had long been creating short demonstration animations, such as *Luxo Jr.*, to show off the device's capabilities—premiered his creations at *SIGGRAPH*, the computer graphics industry's largest convention, to great fanfare.¹⁴

Inadequate sales of Pixar's computers threatened to put the company out of business as financial losses grew. Jobs invested more and more money in exchange for an increased stake in the company, reducing the proportion of management and employee ownership until eventually his total investment of \$50 million gave him control of the entire company. Lasseter's animation department began producing computer-animated commercials for outside companies. Early successes included campaigns for *Tropicana*, *Listerine*, and *Life Savers*.¹⁶ In April 1990 Pixar sold its hardware division, including all proprietary hardware technology and imaging software, to *Vicom Systems*, and transferred 18 of Pixar's approximately 100 employees. The same year Pixar moved from *San Rafael* to *Richmond, California*.¹¹ Pixar released some of its software tools on the open market for Macintosh and Windows systems. *RenderMan* was one of the leading 3d packages of the early 1990s, and *Typestry* was a special-purpose 3D text renderer that competed with *Adobe AddDepth*.

During this period Pixar continued its successful relationship with *Walt Disney Feature Animation*, a studio whose corporate parent would ultimately become its most important partner. As 1991 began, however, the layoff of 30 employees in the company's computer hardware department—including the company's

Validation

- **User Experience Comparison**

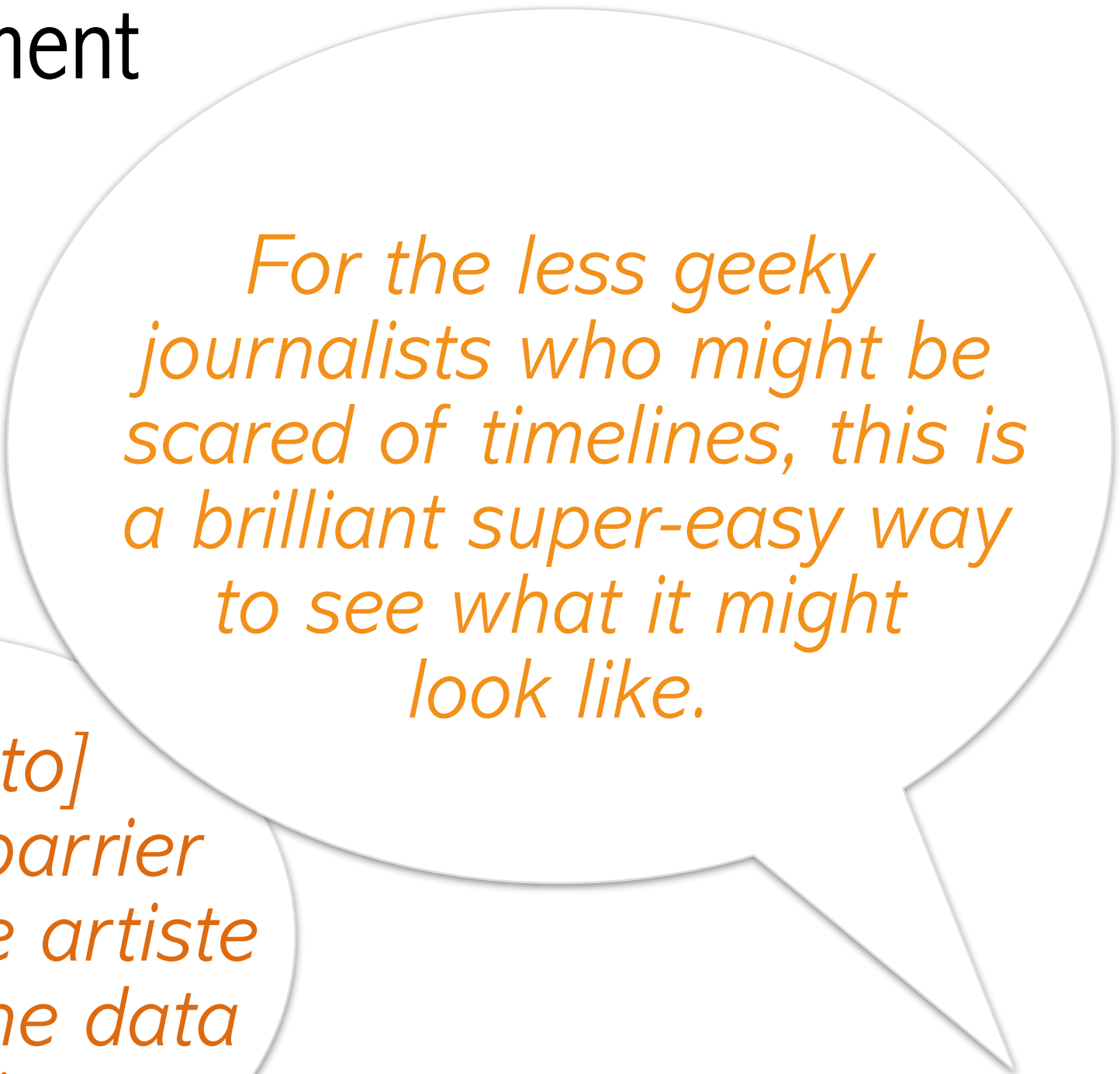
- Comparing TimelineJS approach with TLC
- All participants strongly preferred visual authoring environment

- **Solicited potential users**

- semi-structured interviews with 8 potential users
7 journalists, 1 policy researcher



*[A step to]
break the barrier
between the artistic
writer and the data
journalist*



*For the less geeky
journalists who might be
scared of timelines, this is
a brilliant super-easy way
to see what it might
look like.*

Discussion

- Analysis use case turned out to be popular
- **“Human in the loop”** needed for **curation and deciding** what’s important and interesting

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TimeLineCurator.org

Project page about.TimeLineCurator.org

Example gallery gallery.TimeLineCurator.org



on the
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