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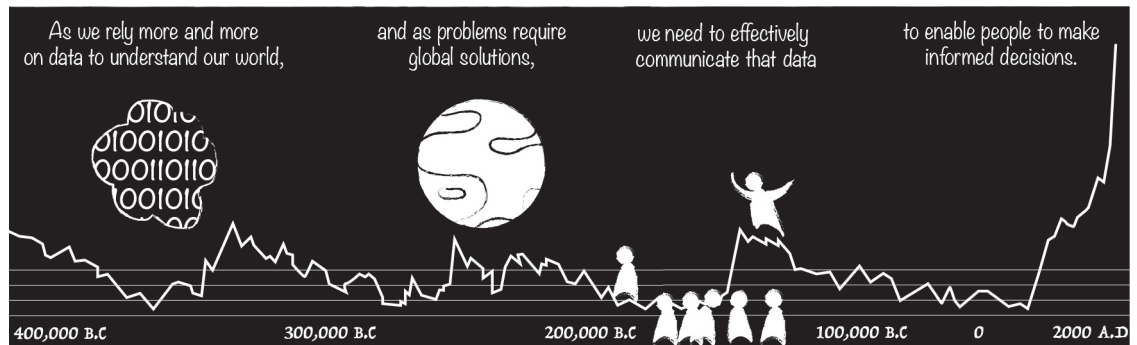
The Emerging Genre of Data Comics

Benjamin Bach
Harvard University

Nathalie Henry Riche
Microsoft Research

Sheelagh Carpendale
University of Calgary

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Harvard University



Visualizations can be effective in showing data,

[1] [2] [3] [4]

but a single picture alone may not be able to explain nor to engage an audience in decoding a message.

How do we engage an audience?

How do we break down complexity?

How do we guide the audience?

There are many ways of data-driven storytelling:

[5]

One of them being comics.

Comic Strip

Although comics are familiar to everyone, they are vastly underexplored for data-driven storytelling.

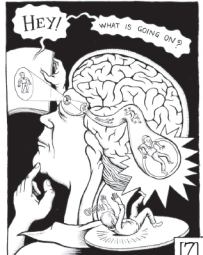
This comic presents our viewpoint on **data comics** and how to leverage comics to tell stories with data.

Comics are an old art, familiar to many.



[6]

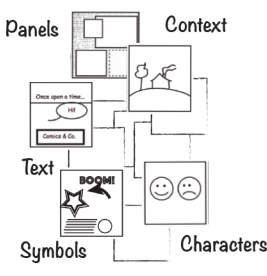
An art to tell stories in engaging ways.



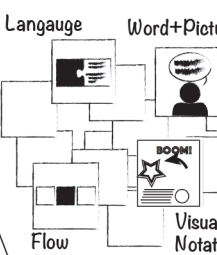
[7]

One that works by established elements and rules,

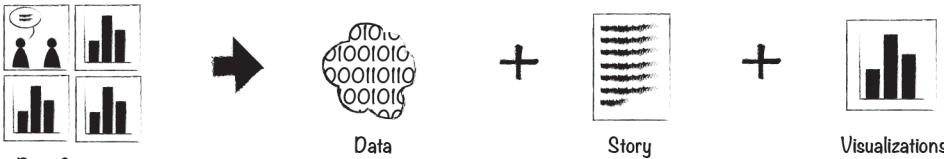
many of which are well studied.



At the same time, comics allow for great expressive freedom.




Here, we explore **data comics** as a new genre, inspired by how comics function, to convey information in data, tell a story, and communicate through visualizations.



Data Comics + Data + Story + Visualizations

Early examples of data comics paved the way...

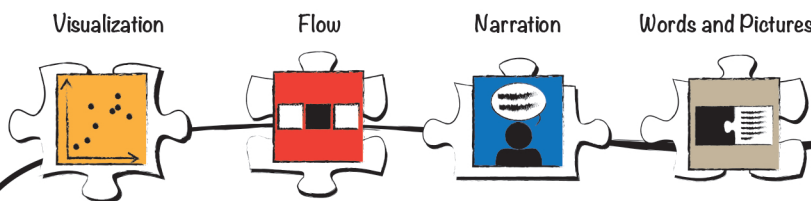


Progress:

- Definition
- Guidelines
- Examples
- Conversation
- Tools

... but the vast field is mostly empty.

Four Essential Components of Data Comics



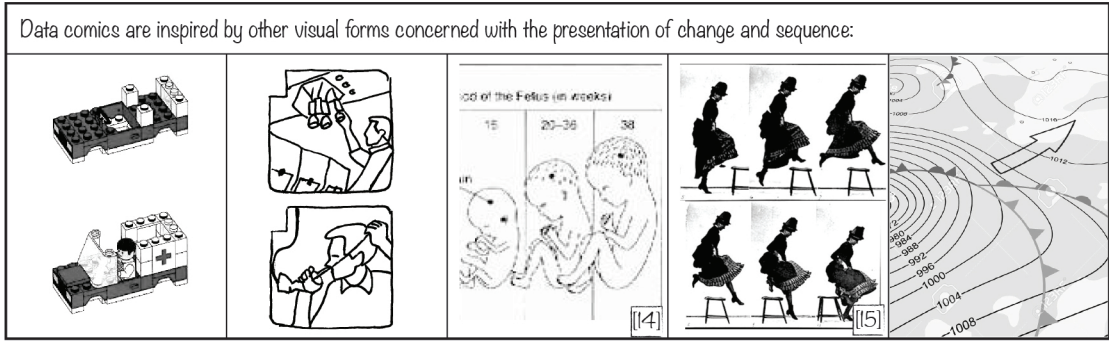
Visualization Flow Narration Words and Pictures

Our goal will be to spot

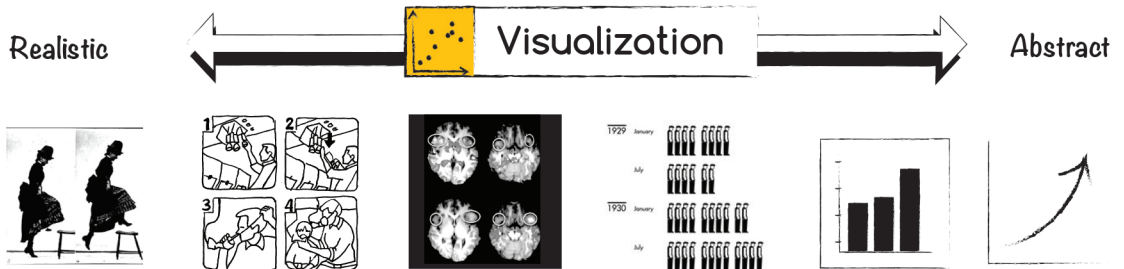
the Island of Data Comics

... in the ocean of storytelling.

We believe it is timely to start this journey now. We start exploring different angles, trying to describe what makes data comics special and show their potential.



We call this component **visualization**, ranging from iconic **realistic** pictures to **abstract** and conceptual visualizations.



While all of these pictures are visualizations, not all of them show **data**.

Data visualizations provide a visual form to something otherwise **invisible**.

In fact, data does not actually have to exist,

nor can we be sure the representation is true.

Data comics can vary in style and detail to support a message

It's going up!
This is unstable!

or use alternative representations to highlight a different point.

Node-Link Diagram

One central node.

Adjacency Matrix

Many missing connections.

A chosen visualization must fit the data, but

? !

most importantly, it must be understood by readers,

Bertin

even those who have never seen a visualization.

Data visualizations are designed to allow for a variety of discoveries and insights:

trends

relations

outliers

clusters

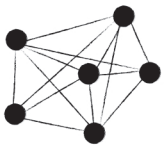
comparisons

change

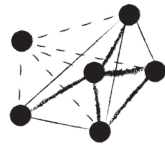
distributions,

which eventually will be shown to the audience.

In storytelling, it is important that people understand the presented content easily,

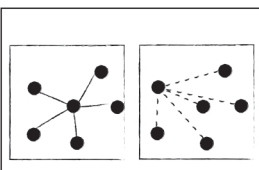


especially when data and visualizations are complex.

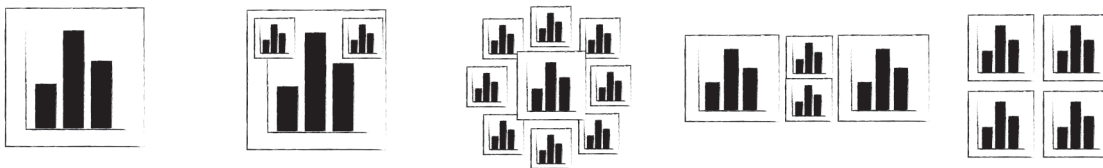


Yet, comics offer a fascinating and simple way:


one message per panel.



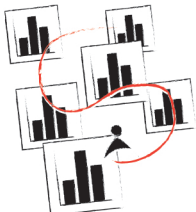
We call this component **flow**, ranging from an **undirected** nonexplicit flow to a **directed** flow indicated by the order of the panels.



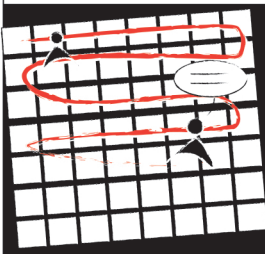
No reading order requires readers to explore by themselves.




Comics can explain complex processes by splitting them into less complex units.



Linear order provides **guidance** and aids argumentation.

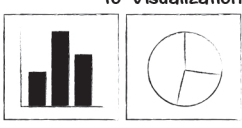
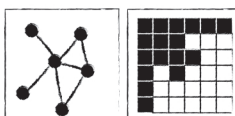


This requires **transition**.

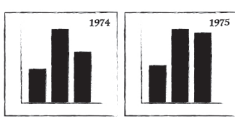
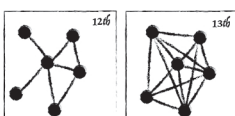


For example:


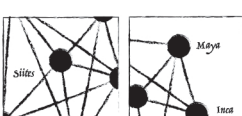
Visualization-to-Visualization

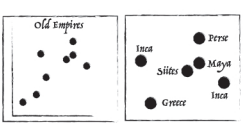
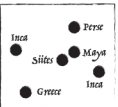
Moment-to-Moment

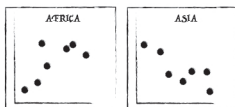
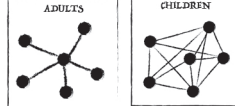
Detail-to-Detail



Level-of-Detail


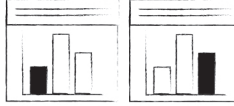
Data-to-Data


Visualization-to-Context

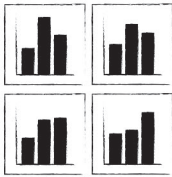
Message-to-Message

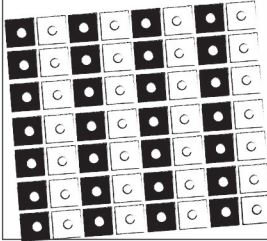
But sometimes, a linear order is not desired or just too simple.



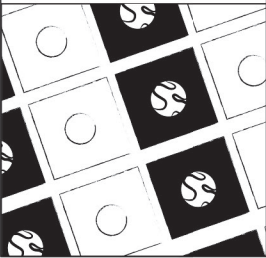
However, sequential visualizations do not yet make a good story nor explanation.



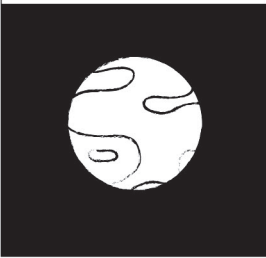
A good story has a **rhythm**,



it draws readers in, it immerses.




But most important, it has a message to the world.



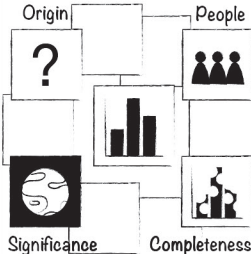
We call this component **narration**, ranging from **factual** arrays of visualizations to richly **narrated** graphic novels.



Data never comes alone,



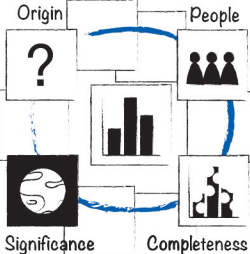
data always has a **context**.



Origin ? People


Significance Completeness

Context creates **story** which wants to be **narrated**.




Origin ? People

Significance Completeness

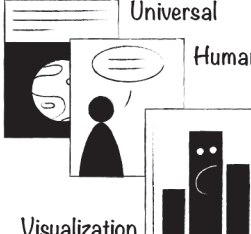


A good narration requires **balance**.



Data Context

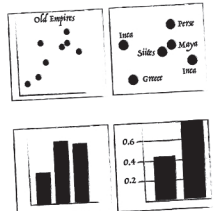
It can use different types of narrators:



Universal Human

Visualization

It makes use of transitions between panels




Old Empires Data

India Silesi Maya Inca

creator

and separates the important from the detail.





But storytelling is an old **art** and learning from the masters

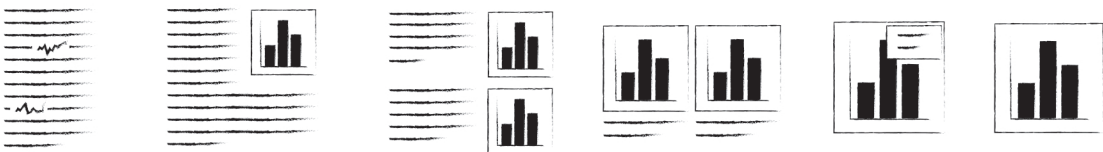


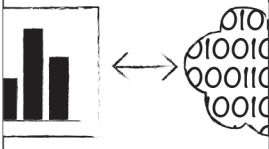
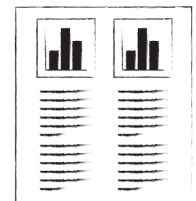
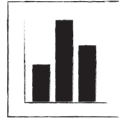
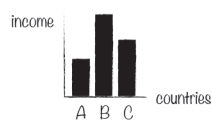
... can help to create truly **dramatic walkthroughs**.


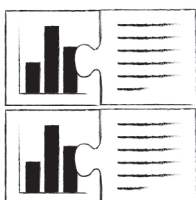
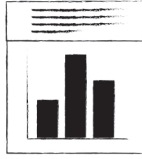







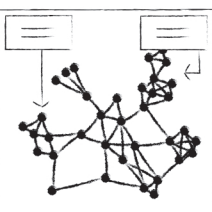
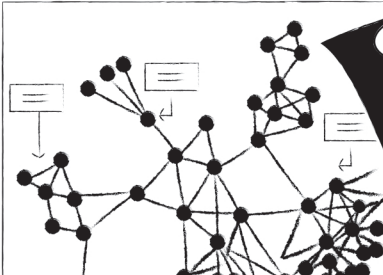

<p>The narrative power of comics comes from</p>  <p>pictures and words</p>	 <p>in symbiosis.</p>	<p>Words can be considered the realm of the verbal:</p> <div style="border: 1px solid black; padding: 5px;"> <p>the logical the sequential the abstract the learned the slow ...</p> </div>	<p>Pictures can be considered the nonverbal:</p> <div style="border: 1px solid black; padding: 5px;"> <p>the factual the parallel the concrete the perceived the fast ...</p> </div>
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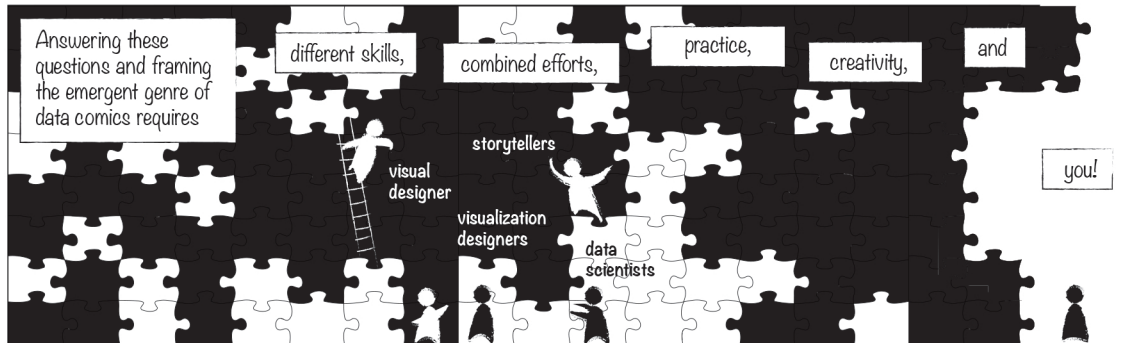
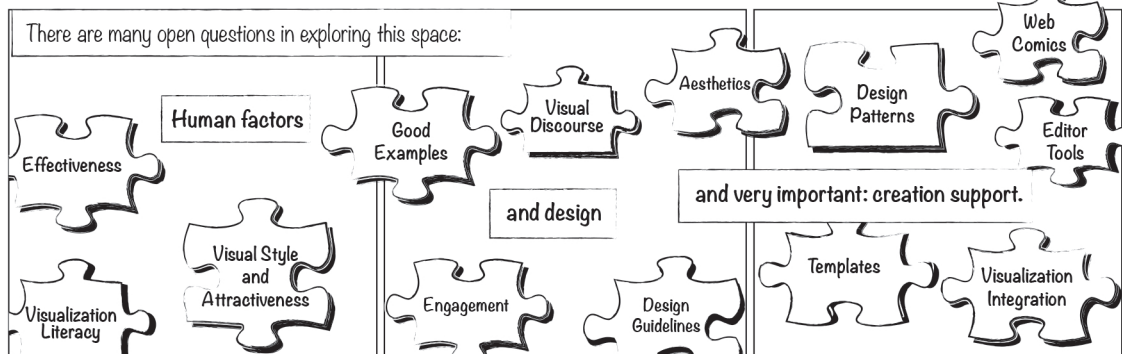
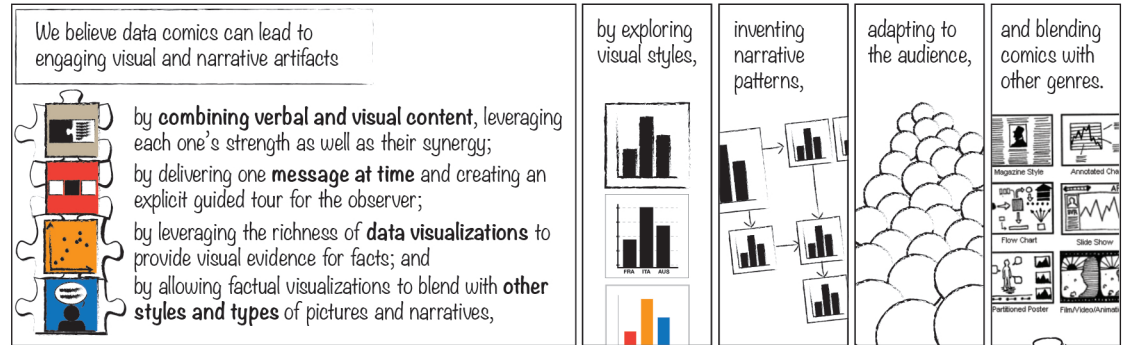
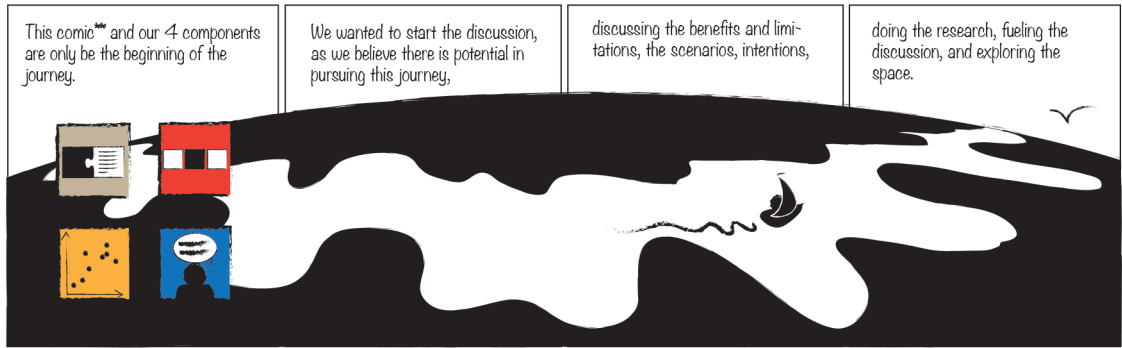
We call this component **Word and Picture**, ranging from almost entirely **verbal**, to **nonverbal** and visual.



<p>In data comics, pictures are mostly visualizations that show evidence in data.</p> 	<p>Pictures can be mere reference to the logic in the words</p> 	<p>or can stand alone where no words are required to convey the intention.*</p>  <p>*Understanding can come from context, but more text may be better than less.</p>	<p>Words can help understand a picture, explaining and telling us what to look at.</p>  <p>Can you figure out which countries are shown?</p>
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<p>Data comics embrace both words and pictures to create a better understanding.</p> 	<p>A combination can mean associating paragraphs with pictures</p> 	<p>or integrating text into pictures,</p> 	<p>or pictures into text.</p> <p>We can show an increase or any other pattern in temporal data . Others showed soccer games , or the amount of change in data , changes in networks , and small maps .</p> <p>[16-20]</p>
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<p>Eventually, text can become mere annotations,</p> 	<p>leaving more space for the visualization</p>  <p>and for the observers to explore.</p> 	
--	---	--



** This is **not** a data comic, as it does not tell a story about data. It is an homage to Scott McCloud [6].

www.datacomics.net

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Editor's Note

The authors behind this special Art on Graphics department article—Benjamin Bach, Nathalie Henry Riche, Sheelagh Carpendale, and Hanspeter Pfister—also contributed this issue's cover image. See the About the Cover profile article, "Stories in the Data," for more details about their motivation, creative process, and attempts to leverage the massive untapped potential for data-driven comics to explain multiple threads of simultaneous data.

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