

reflections on how designers design with

DATA

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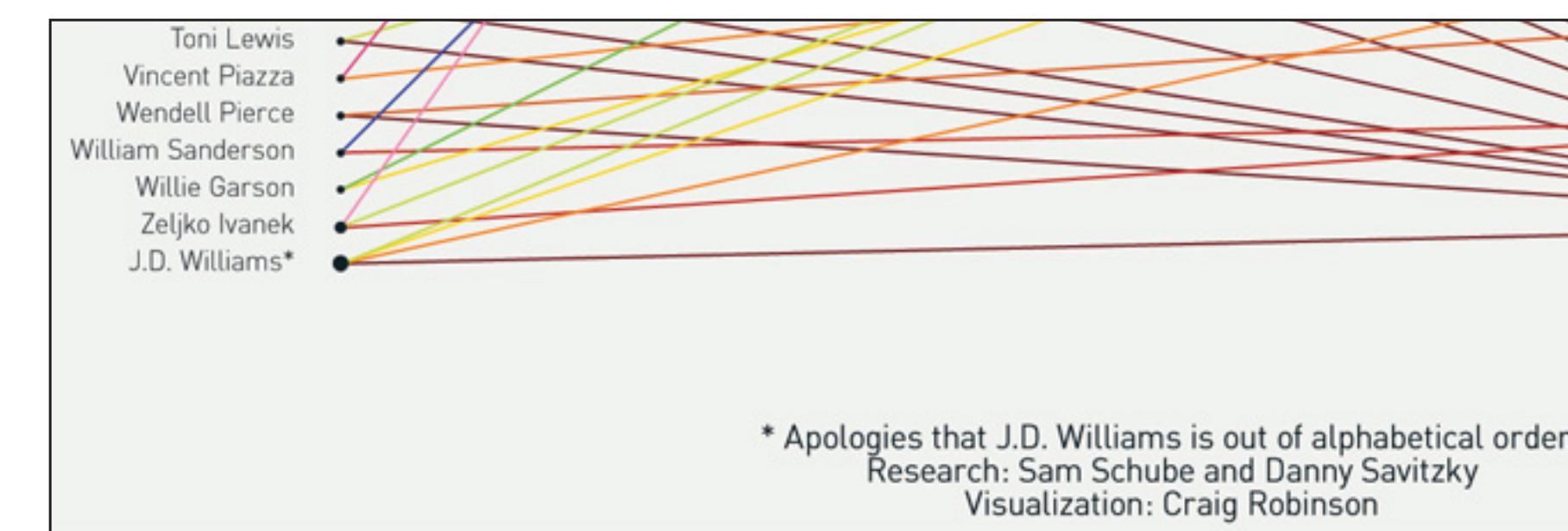
Danyel Fisher

Miriah Meyer

Steven Drucker

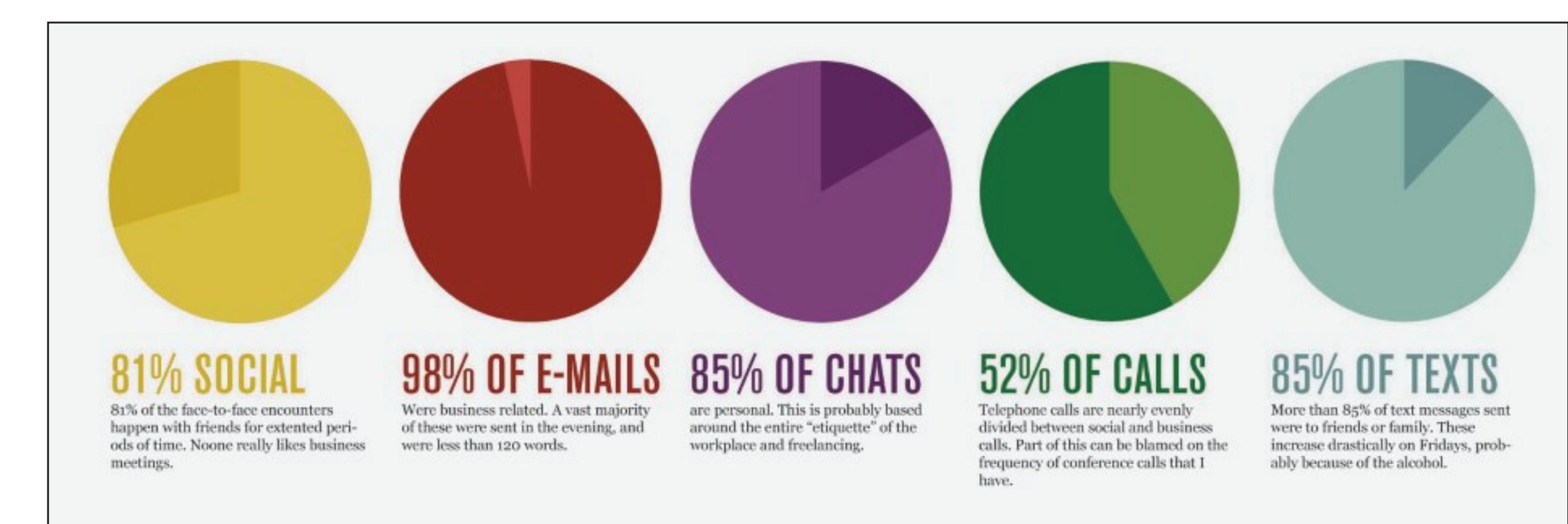
In recent years many popular data visualizations have emerged that are created largely by designers whose main area of expertise is not computer science. Designers generate these visualizations using a handful of design tools and environments. To better inform the development of tools intended for designers working with data, we set out to understand designers' challenges and perspectives. We interviewed professional designers, conducted observations of designers working with data in the lab, and observed designers working with data in team settings in the wild. A set of patterns emerged from these observations from which we extracted a number of themes that provide a new perspective on design considerations for visualization tool creators, as well as on known engineering problems.

Examples of infographics where the visual representations do not explicitly match the data:



One item in an ordered list is out-of-order.

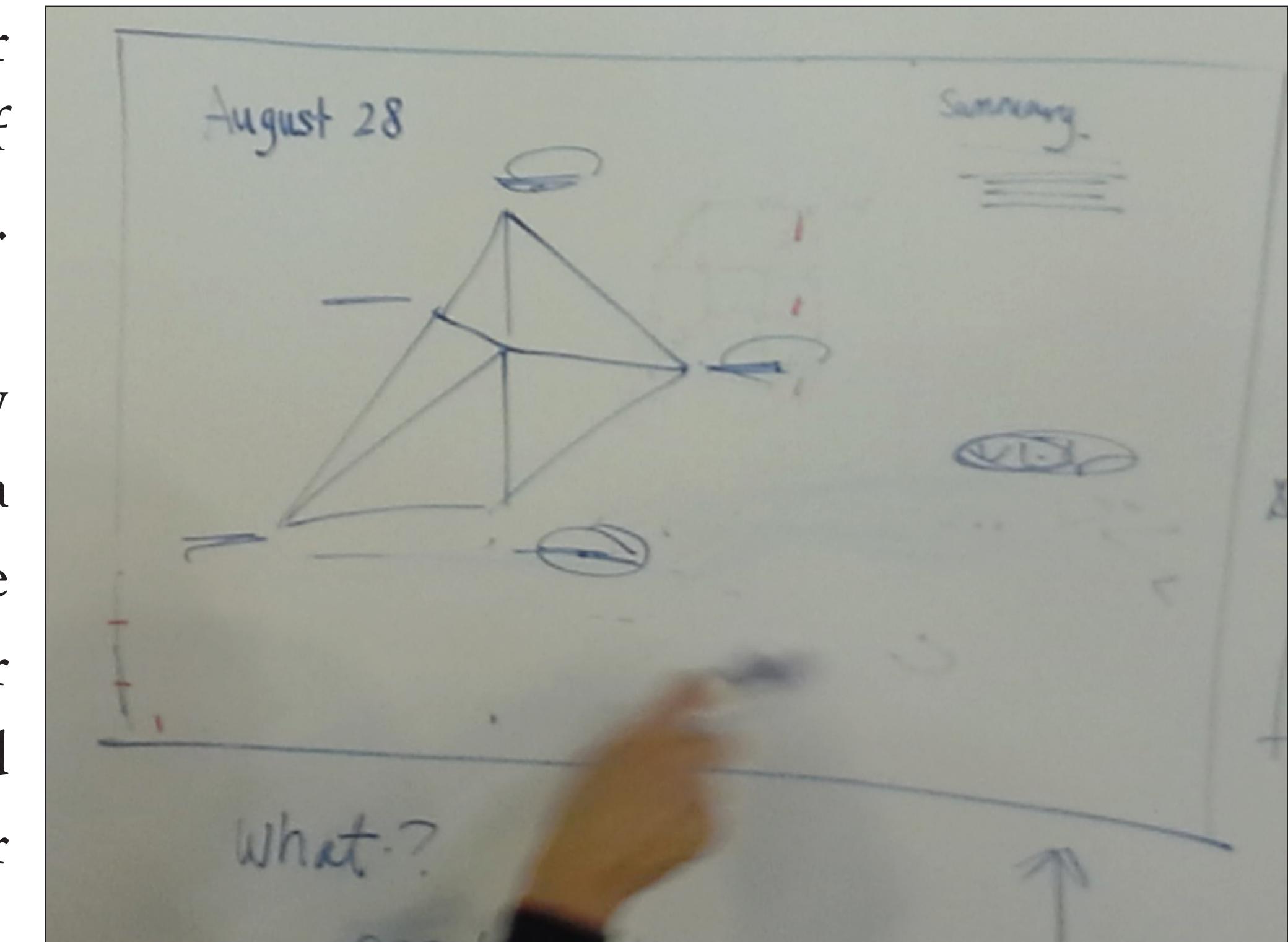
Gender	Design Role	Programming Experience	Data Experience
One 2-hour Exercise (Time Travel)			
M	Student	None	None
F	Student	None	None
Two 2-hour Exercises (Time Travel)			
F	Industry-software	None	Basic
F	Industry-software	None	Basic
One 2-hour Exercise (HBO)			
M	Industry-freelance	Basic	Basic
F	Industry-software	Basic	Basic
10 hours observation at hackathon (FitBit)			
F	Industry-software	None	Basic
F	Industry-software	Basic	Expert
3 hours observation at hackathon (Bug Tracking)			
F	Industry-software	None	None
Unstructured Interviews			
M	Academic	None	Basic
M	Industry-design firm	Expert	Expert
Semistructured Interviews			
M	Academic	Expert	Expert
M	Industry-freelance	Basic	Basic
F	Academic	Basic	Expert
M	Industry-laboratory	Expert	Expert



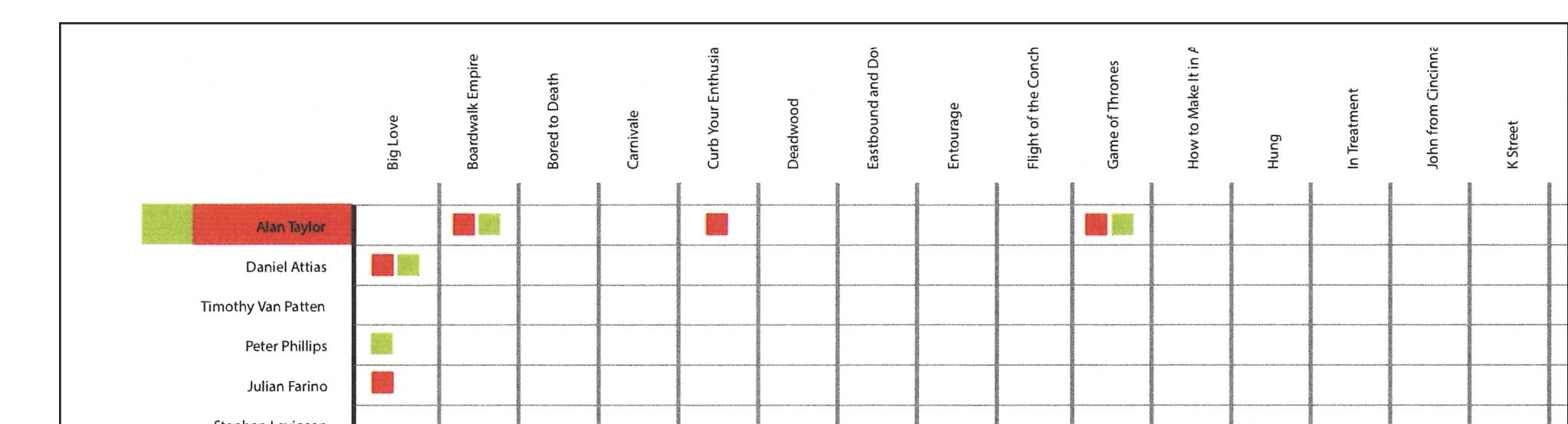
The percentages in the pie charts do not match the text.

A sketch of a radar graph in context of the rest of the design.

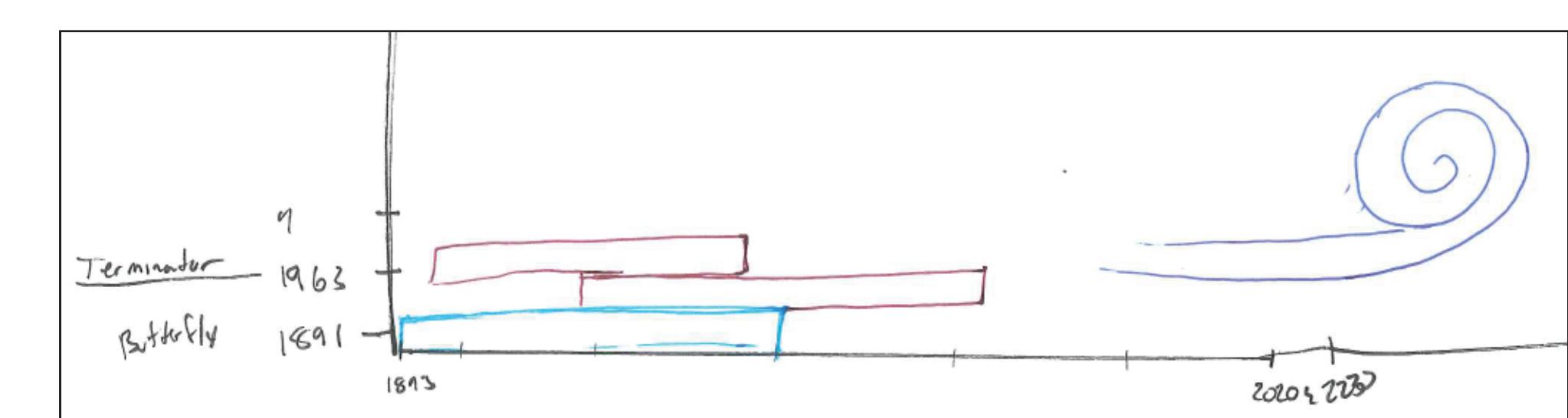
Without the ability to explore data behavior, these designers never considered encodings other than a radar graph.



We observed how data can both limit and inspire variety in design:



Designers simply recreated a relational dataset's tabular format.



Designers often introduced creative encodings to handle outliers.