Toward an Analysis of Practitioner-Oriented Resources for Visualization Design

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ABSTRACT

Numerous online resources for supporting visualization design have been developed in recent years. Although many have become popular among practitioners, they have not received systematic analysis in the academic literature. Here we present a preliminary analysis focused on one subset of online practitioner-oriented resources—those that aid in choosing visualization techniques based on a designer's communicative intent. We report the results of a comprehensive search for such resources, and discuss findings of an analysis based on multiple characteristics including communicative intent. Finally, we discuss implications and future research directions.

Introduction

One challenging aspect of visualization design is having to choose among different yet equally viable alternatives throughout a design process. Various forms of design support have been developed (e.g., methods, models, and frameworks). Popular forms of support for visualization designers focus largely on issues related to user goals, tasks, data types, visual encodings, and interaction techniques, yet place little focus on a *designer's goals and intentions*.

Although a focus on **communicative intent** is missing in scholarly works, practitioner-oriented resources appear to focus strongly on this theme. Numerous resources aid designers in choosing visualizations by proposing questions regarding communicative intent:

> *"what do you want to show?"* *"what story are you trying to tell?"*
>
> *"which data relationship is most important to your story?"*

Common answers include *hierarchy, flow, comparison, distribution, temporal change,* and *part–to–whole*.

Catalogs and other forms of design support that help designers make decisions based on communicative intent can be beneficial, yet they are currently lacking in the literature. Here we report on our initial analysis of online practitioner-oriented resources that support visualization design based on communicative intent.

Methods

To identify resources for analysis, all 3 authors searched online independently and met multiple times during the search period.

5 inclusion criteria were determined—each resource should: (1) support decisions based on communicative intent; (2) be general, not aimed at highly specific data or visualizations; (3) be online; (4) be freely accessible; and (5) focus on abstract data or information.

After identifying 10 resources, we extracted all communicative intents from each one—76 in total. We merged the overlapping ones and listed the final 22 communicative intents.

	Resource	# viz	# categories	Interactive	Tutorial	Examples	Design tips
R1	The Data Viz Project	154	7	■		■	
R2	The Data Visualisation Catalogue	60	16	■	■	■	■
R3	Chart.Guide	70	7	■	■	■	
R4	R Graph Gallery	173	8	■	■	■	
R5	Python Graph Gallery	46	8	■	■	■	
R6	Financial Times Visual Vocabulary	72	9	■		■	■
R7	Chart Chooser (Juice Analytics)	17	6	■	■	■	
R8	Qualitative Chart Chooser (v3)	20	5			■	■
R9	Choosing a good chart	23	4			■	
R10	Classification of chart types	27	6			■	■

10 online practitioner-oriented resources meeting the inclusion criteria. Rows are resources, columns are characteristics.

Findings

Our analysis reveals a number of interesting points:

- Use of Communicative Intents: practitioners are indeed using forms of design support based on communicative intent.
- Frequency of Intents: some intents appeared multiple times in the analyzed resources, which may suggest popularity or importance among practitioners.
- Missing Details: methodological details for any of these resources are virtually nonexistent.
- Inconsistent Terminology: vocabulary across resources is not consistent, making it harder to identify whether terms refer to the same ideas or not.

	Communicative Intent	The Data Viz Project (R1)	The Data Visualisation Catalogue (R2)	Chart.Guide (R3)	R Graph Gallery (R4)	Python Graph Gallery (R5)	Financial Times Visual Vocabulary (R6)	Chart Chooser (Juice Analytics) (R7)	Qualitative Chart Chooser (v3) (R8)	Choosing a good chart (R9)	Classification of chart types (R10)	Frequency
i1	Analyze text		■						■			2
i2	Change over time	■	■	■			■	■				5
i3	Cluster								■			1
i4	Comparison	■	■	■				■	■	■	■	7
i5	Composition							■		■	■	3
i6	Concepts	■	■									2
i7	Correlation	■		■	■	■	■					5
i8	Deviation						■					1
i9	Distribution	■	■	■	■	■	■	■		■	■	9
i10	Evolution				■	■						2
i11	Geographical/Spatial	■	■		■	■	■					5
i12	Hierarchy		■						■			2
i13	How things work		■									1
i14	Movement or flow		■		■	■	■		■			5
i15	Part to whole	■	■	■	■	■	■					6
i16	Patterns		■									1
i17	Processes & methods		■									1
i18	Profiling										■	1
i19	Proportions		■				■					2
i20	Range		■									1
i21	Rankings				■	■	■					3
i22	Relationship		■	■				■		■	■	5

Overview of communicative intents (rows) from the analyzed resources (columns). Frequency bars show the number of times an intent appeared across the resources.

Future Work

Our follow-up work will pursue the following next steps:

(a) expand our scope to include non-online media (e.g., books and papers); (b) develop a comprehensive typology that helps designers choose visualizations based on communicative intent; (c) integrate both cognitive and observational advantages to create a larger catalog that supports visualization design; and (d) develop an online interactive version of the catalog to make it widely accessible to practitioners.

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