

Table 1: Heuristic assessment: Categorized by agreement levels - low (<50%), moderate (50-75%), and high (>75%) - marked with red, yellow, and green, respectively

conversational states	Heuristics	Mean Round 1	Mean Round 2	Percentage Score Round 1	Percentage Score Round 2	Difference	
Initiation	H1	3.79	4.17	71.43	75	3.57	The dashboard supports specific analytical questions or tasks.
	H2	4.27	4.50	93.33	100	6.67	The user should be able to explore the data using the dashboard.
	H3	3.33	4.45	60	90.91	30.91	It is clear to the user where they need to start interacting with the dashboard.
	H4	3.62	4.17	53.85	91.67	37.82	The charts in the dashboard support tasks that represent the overall intended goal to the user.
	H5	3.67	4.33	53.33	91.67	38.34	There is a clear reading order within the dashboard and is it logical (e.g., top-down, bottom-up)
	H6	3.53	4.17	60	91.67	31.67	The text in the dashboard is legible, easy to read, and useful, and the different parts of the chart (e.g., titles, captions, or narration) are well described.
	H7	4.20	4.42	93.33	100	6.67	The charts in the dashboard clearly identify, compare, or summarize a particular aspect of the data.
	H8	3.13	4.25	60	100	40	The layout, placement of charts, and the flow in the visualization are easy to follow.
	H9	3.87	3.83	65	66.67	1.67	The visual systems in place (e.g., a consistent font and color brand) provide guidance in understanding the analysis.
	H10	3.86	4.43	80	83.33	3.33	There is a clear and consistent visual style for elements such as titles, axes, and colors
	H11	3.73	4.17	53.33	91.67	38.34	The conventions used in the dashboard such as icons are easy to understand for the user.
	H12	3.80	4.08	73.33	91.67	18.34	There are consistent rules for the formatting of elements such as grid-lines, borders, and supporting ink elements.
	H13	3.13	3.67	37.5	66.67	29.17	The dashboard discloses any biases, including the author's personal biases, design biases, and/or biases in the data.
	H14	3.09	3.20	39	40	1	The dashboard communicates where the data came from and what steps were taken to prepare the data.
Grounding	H15	3.39	3.50	57	58.33	1.33	Charts within the dashboard are at the appropriate level of detail to convey the intended message.
	H16	3.31	3.58	30.77	66.67	35.9	There is a clear presentation of context, theme, and detail as part of the analytical exploration with the dashboard.
	H17	3.53	3.67	52	58.33	6.33	The dashboard employs visual symbols and icons to add meaning to the data being presented or help support the intended message.
	H18	3.67	4.20	60	90	30	If there are icons and symbols in the dashboard, the semantics of their placement and appearance are helpful to communicate patterns in the data. (e.g., adjusting arrow icons to signal ascending or descending sorting in tables.)
	H19	3.77	4.10	69.23	90	20.77	The iconography supports or potentially replaces repetitive text directives.
	H20	3.80	3.92	73.33	83.33	10	Concepts or metrics (e.g., date formats, time, measurement) are either easily understandable or clearly defined in the dashboard.
	H21	3.14	3.50	42.86	66.67	23.81	There is sufficient contextual information that describes what the dashboard is about.
	H22	4.00	4.00	80	83.33	3.33	The charts within the dashboard make sense as an overall composition to help situate or contextualize the user.
	H23	3.86	4.00	80.71	81.82	1.11	There is adequate evidence that the dashboard is truthful. The dashboard should be able to convince the key takeaway through credibility and trustworthiness.
	H24	3.43	3.90	50	70	20	The dashboard communicates a certain style or mood to the user.

Turn & Taking	H25	3.46	3.58	53.85	66.67	12.82	The dashboard is interactive and supports the user in completing a new analytical task or starting a new line of inquiry.
	H26	3.62	4.27	61.54	90.91	29.37	Tasks in the dashboard are achieved with minimal friction.
	H27	3.00	3.36	35.71	45.45	9.74	When a user interacts with the dashboard, the dashboard guides the user with their next step.
	H28	3.85	4.10	84.62	90	5.38	The dashboard updates its view based on what is selected, highlighted, or filtered by the user.
	H29	3.43	3.58	53.29	58.33	5.04	There are text and visual elements to frame or guide salient information.
	H30	3.16	3.27	35.71	45.45	9.74	There is a clear path and breadcrumbs for user actions within the dashboard.
	H31	2.75	3.20	25	40	15	There are clear strategies employed in the dashboard to mark charts or marks more prominently than others to encourage a user to interact with them, as well as de-emphasise items not relevant to the conversation.
Repair & Refinement	H32	4.15	4.18	76.92	90.91	13.99	Functional dead end: The dashboard does not freeze, crash, display errors, or otherwise unexpectedly interrupt the user.
	H33	3.92	4.00	76.92	81.82	4.9	Navigational dead end: The dashboard supports Interactivity (e.g., filters, search) to help a user navigate between different snapshots of the data being presented.
	H34	3.05	3.00	51.73	54.55	2.82	The dashboard should support input modalities (e.g., natural language interaction, filter widgets, and or clicks) to answer any analytical question or task.
	H35	3.00	3.00	40	44.44	4.44	Can you change settings on the dashboard to adjust how it displays the data?
Close	H36	3.92	3.92	81.62	83.33	1.71	There is a clear takeaway from the dashboard.
	H37	3.38	4.00	53.85	72.73	18.88	The dashboard does not contain any information that distracts from the key takeaway.
	H38	3.73	3.80	69.82	70	0.18	The conclusions match what the charts in the dashboard show.
	H39	3.43	3.86	68.89	71.43	2.54	There is adequate evidence that the dashboard is truthful. The dashboard should be able to convince the key takeaway through credibility and trustworthiness.