

Paper Summary

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Title: User Perceptions of Actionability in Data Dashboards

Authors: Madeleine Sorapure

DOI: 10.1177/10506519231161611

Year: 2023

Publication Type: Journal Article

Discipline/Domain: Technical and Professional Communication / Data Visualization

Subdomain/Topic: COVID-19 Dashboards, Actionability, User Perceptions

Eligibility: Eligible

Overall Relevance Score: 92

Operationalization Score: 88

Contains Definition of Actionability: Yes (explicit and implicit)

Contains Systematic Features/Dimensions: Yes

Contains Explainability: Yes

Contains Interpretability: Yes

Contains Framework/Model: Yes (Ivankovi█ et al.'s 7 criteria + added dimensions)

Operationalization Present: Yes

Primary Methodology: Qualitative (usability study with thematic analysis)

Study Context: Evaluation of two COVID-19 county-level dashboards (Santa Barbara County, CAN)

Geographic/Institutional Context: Santa Barbara County, California, USA; University of California, Santa B

Target Users/Stakeholders: Nonexpert public users of public health dashboards

Primary Contribution Type: Empirical study expanding conceptual framework of dashboard actionability

CL: Yes

CR: Yes

FE: Partial

TI: No

EX: Partial

GA: No

Reason if Not Eligible: N/A

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COVID-19 Dashboards, Actionability, User Perceptions

****Contextual Background:****

The study examines how nonexpert users interact with COVID-19 dashboards, particularly regarding actionability.

****Geographic/Institutional Context:****

Santa Barbara County, California; University of California, Santa Barbara

****Target Users/Stakeholders:****

Nonexpert, general public users of public health dashboards

****Primary Methodology:****

Qualitative usability study with think-aloud protocols, thematic analysis, and post-interview survey

****Primary Contribution Type:****

Empirical evaluation and conceptual extension of dashboard actionability framework

General Summary of the Paper

The article reports on a multiphase usability study of ten nonexpert participants interacting with two COVID-19 dashboards.

Eligibility

Eligible for inclusion: ****Yes****

How Actionability is Understood

Actionability is explicitly defined as the ability of data dashboards to inform and support user decision making.

> “Actionable data—that is, data that can inform decisions that users need to make” (p. 257)

> “There needs to be a ‘fit’ between the information, the user, and the purposes for which the information is used.”

What Makes Something Actionable

- Alignment with audience needs and contexts
- Appropriate type, amount, and organization of information
- Clear data sources and methodology
- Time trends linked to relevant decisions
- Locally granular data
- Demographic subgroup breakdowns
- Storytelling and intuitive visual cues
- Emotional engagement that does not overwhelm decision making

How Actionability is Achieved / Operationalized

- **Framework/Approach Name(s):** Ivankovi█ et al.'s seven criteria for actionable dashboards (adapted)
- **Methods/Levers:** Usability design principles (navigation structure, composite indicators, visual simplification)
- **Operational Steps / Workflow:** Audience analysis → Data selection → Display design (tabs, color coding)
- **Data & Measures:** Infection rates, vaccination rates, hospitalizations, mortality, demographic breakdowns
- **Implementation Context:** COVID-19 public health dashboards at county level

> “Participants frequently discussed wanting to find data that met their information needs, was relatively easy to understand, and was actionable.”

> “Accounting for the emotional impact of data dashboards... would be a helpful addition to an analysis of dashboard design.”

Dimensions and Attributes of Actionability (Authors' Perspective)

- **CL (Clarity):** Yes — clarity of visual presentation and navigation linked to actionability (p. 267)
- **CR (Contextual Relevance):** Yes — local and personally relevant data emphasized (p. 265)
- **FE (Feasibility):** Partial — some acknowledgment of limits on user actions in pandemic context (p. 267)
- **TI (Timeliness):** No — timeliness not explicitly tied to actionability beyond data recency
- **EX (Explainability):** Partial — accessible explanations provided but often underutilized by users (p. 267)
- **GA (Goal Alignment):** No explicit mention
- **Other Dimensions Named by Authors:** Emotional impact of data viewing; need for prioritization of critical information

Theoretical or Conceptual Foundations

- Ivankovi█ et al.'s seven actionability criteria
- Concepts of “fitness for purpose” and “fitness for use” in dashboard design
- User-centered design principles from TPC and data visualization literature

Indicators or Metrics for Actionability

- Composite risk scores with visual color scales
- Survey agreement ratings on actionability criteria (Likert scale)
- User-reported clarity, relevance, and decision-making support

Barriers and Enablers to Actionability

- **Barriers:** Information overload; low granularity; inaccessible explanations; emotional stress; scrolling
- **Enablers:** Local data; concise summaries; familiar visual metaphors; intuitive navigation; demograph

Relation to Existing Literature

Positions findings within ongoing debates on COVID-19 dashboards' effectiveness, contributing empirical

Summary

Sorapure's study offers an in-depth empirical look at how nonexpert users perceive and use public health

Scores

- **Overall Relevance Score:** 92 — Strong explicit and implicit conceptualization of actionability, detailed
- **Operationalization Score:** 88 — Clear application of an existing framework to dashboard design and

Supporting Quotes from the Paper

- "Actionable data—that is, data that can inform decisions that users need to make" (p. 257)
- "There needs to be a 'fit' between the information, the user, and the purposes for which the information
- "Participants frequently discussed wanting to find data that met their information needs, was relatively e
- "Accounting for the emotional impact of data dashboards... would be a helpful addition to an analysis of

Actionability References to Other Papers

- Ivankovi■ et al. (2021) — Features constituting actionable COVID-19 dashboards
- Barbazza et al. (2021) — Assessment of dashboard actionability over time
- Yigitbasioglu & Velcu (2012) — Fitness for purpose/use in dashboards
- Pappas & Whitman (2011) — User-centered design for dashboard development