Building Sustainable Open-Source Dashboards

Archival Strategies for Long-Term Access

Dashboards as research outputs

- Knowledge translation tools
  - Can communicate complex data trends and relationships to diverse interested parties
  - Democratisation of research results

- Educational tools
  - Dynamic and interactive, allow for exploration of trends

- Can act as a tool for further research

- Monitoring systems

- Evidence based decision making

Dashboards as research outputs

- Still a relatively "new" research output

- Unlike papers, recorded presentations, posters…
  - Much more transient
  - Can disappear far more easily

- How does this tie into the idea of reproducible and replicable research?

- The difficulty in sustaining a dashboard over long timescales has been noted by researchers

Rossi, Fernanda S., Meredith C. B. Adams, Gregory Aarons, and Mark P. McGovern. 2025. "From Glitter to Gold: Recommendations for Effective Dashboards from Design through Sustainment." Implementation Science: IS 20 (1): 16.

Wu, Elwin, Jennifer Villani, Alissa Davis, Naleef Fareed, Daniel R. Harris, Timothy R. Huerta, Marc R. LaRochelle, Cortney C. Miller, and Emmanuel A. Oga. 2020. "Community Dashboards to Support Data-Informed Decision-Making in the HEALing Communities Study." Drug and Alcohol Dependence 217 (108331): 108331.

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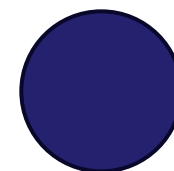
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What does "archiving" or "preserving" mean to you in reference to interactive dashboards?

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What does "archiving" or "preserving" mean to you in reference to interactive dashboards?

RESULTS SLIDE

What do we mean by preservation?

- <u>Reproducibility, replicability, reusability</u>
- Who are we preserving the dashboard for?
  - Other researchers who study our methods?
  - The end-users of the dashboard
    - How much of a computational background do they have?
  - A specific organisation that uses it
- Why do we need to preserve it?
  - For good, reproducible research
  - Because it's being actively used

Challenges with preservation

- **Money and time**
- Software licensing
- Hosting costs
- Maintenance time
- Security updates
- Fixed-term data sharing agreements
- Changing free provisions

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In this workshop

- Sustainable software development for one form of archiving and preservation
- Community, collaboration, co-design
- Creative solutions and out-of-the-box approaches, building cheap from the start!

We'll build on these four pillars, and also discuss…

- When should we *not* try to preserve a dashboard?

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Using the Q&A options

Sustainable software development

- Tools to ensure a record of our work is maintained

- Use of the dashboard preserved in this manner will require technical skills (setting up coding environments etc.)

- Important from a research perspective (reproducibility)

- The aim here:
  - To let people re-build and use the app beyond it being actively hosted on a server
  - Preserving research

Community, collaboration, co-design

- If you keep a dashboard live, you need to...
  - Ensure that the data is up-to-date
  - Maintain it from a security standpoint
  - Update and improve the methods
- Even if you have a way to keep the dashboard hosted, you will need support!
  - Partnering with a group that will then take ownership
  - Community support

Creative solutions

- Moving from the server-powered expensive web applications...
- What can we build with static html pages?
- How do we create useful dashboards for users with affordable technology?
- What do we need to prioritise?
  - Professional, sleek experience
  - Information delivery
  - Education

When to let go

- When should we take down a dashboard?
- Recognising the differences between dashboards and other research outputs
  - The web is a living thing

Webapps are not static, unchanging resources

- Hosting costs money
- But also…
  - Storage is not free
  - Online free services can close
  - There is no entirely "free" way to maintain a web app indefinitely
- Maintenance costs money
  - Need to provide a safe and secure web app for users
  - Data may need updating
    - Methods may change
    - Accessibility standards
- Hosting and storage uses energy

How do we decide?

- Who is using the app?
  - Analytics, measure visitors, gather feedback
  - Is it essential to someone's workflow?
  - How computationally experienced are the users
    - Will they be able to build a local version?

- How relevant is the app?
  - Are there alternatives you can direct people to?
  - Is the data up-to-date and accurate?
  - Can the work be summarised in a publication or report?

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Continue the conversation

- https://github.com/murphyqm/archival-strategies
- GitHub discussions

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