MANCHESTER 1824
The University of Manchester

IAMlab Interaction Analysis and Modelling Laboratory

User Modelling & Adaptive Interaction on Interactive Dashboards

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OVERVIEW

Definition

An interactive dashboard is a technology that enables viewing and interacting with a comprehensive summary of complex data using visualisations (charts, tables, maps, etc.) typically on a single display.

Main Types

OPERATIONAL
- *Monitoring & evaluating operations*
- *Used by front-line workers*
- *On a real-time basis*

TACTICAL
- *Reviewing performance & evaluating tactics.*
- *Used by managers*
- *A day to a week of time reflected*

STRATEGIC
- *Evaluating strategies*
- *Used by executives*
- *Longer temporal scale (months to a year)*

GOAL

Research Questions

1. What are the interaction and information presentation ***challenges*** users encounter when they interact with dashboards?
2. What are the ***adaptations*** that can be applied on dashboards? Which of these adaptations can be applied to address the problems found in RQ1.
3. How can we ***intervene*** to adapt the user interface? Do the adaptations improve the interaction with dashboards?

Objectives

- ☑ Identifying dashboard challenges in the literature.
- ☑ Understanding users' strategies when interacting with dashboards.
- ☑ Exploring how adaptation techniques are built by designers.
- ☑ Modelling user interaction based on goals, background, interests, etc.
- ☑ Introducing adaptation techniques for better adaptive dashboards.

IDENTIFIED CHALLENGES

User Flexibility Challenges

- Level of Detail Adjustment
- User Adaptability
- Situation Adaptability
- System Integration
- Comparison Support

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Data Design Challenges

- Data Oversimplification
- Too Much Data
- Data Quality
- Data Sources
- Inaccurate Data Representation

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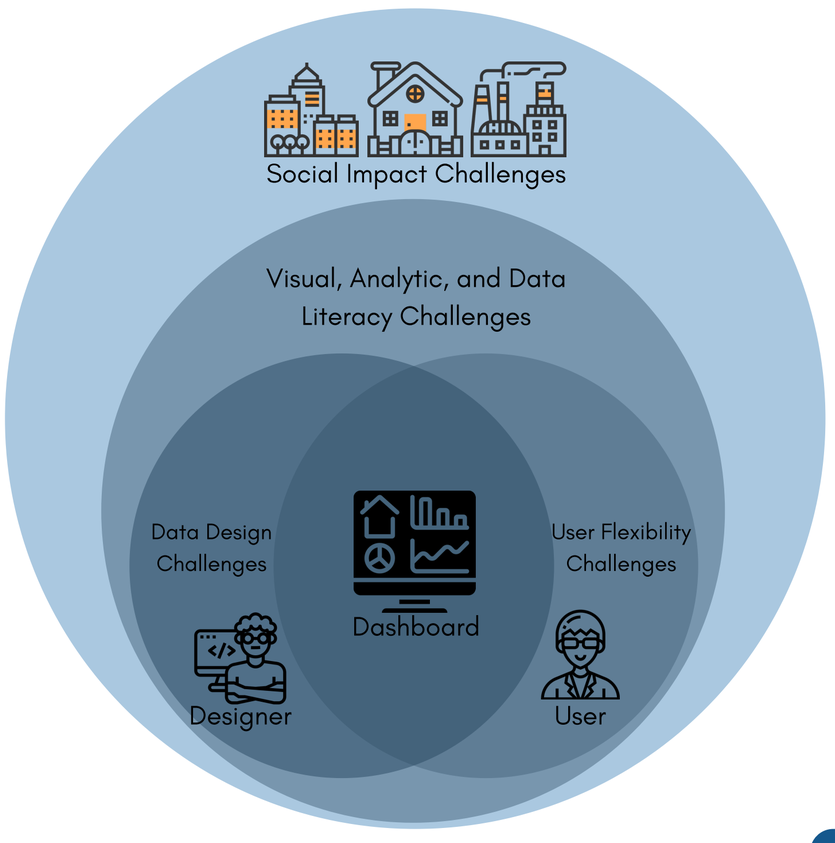

Visual, Analytic & Data Literacy Challenges

- Visual Literacy
- Analytic Literacy
- Data Literacy
- Ease of Use
- Dashboard Evaluation

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Social Impact Challenges

- Data-driven Thinking
- Added Value
- Sharing, Security & Trust
- Automation
- Technology Resistance

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WHAT NEXT?

We'll **conduct a study** to understand how users interact with dashboards with known challenges and what they do to overcome them.

In light of previous findings, we'll build **user models** based on goals, background, interest, etc.

We'll then **interview expert** dashboard designers to understand how adaptation techniques are built into dashboards.

After that, we'll **introduce adaptations** to information dashboards based on what we learned from previous work.

REFERENCES

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