



# Designing a Self-Service BI Dashboard for HESA Data Quality

Amina Meah

ACCA6029

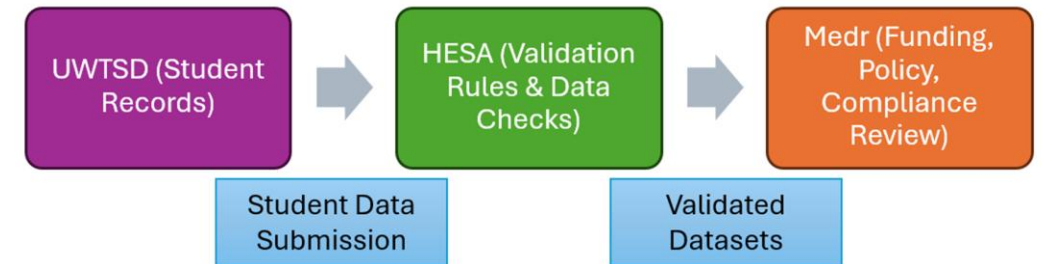
# Background and Content

## Higher Education (HE) in Wales

- HESA: collects & validates student data
- Medr: distributes funding, regulates HE (since 2024)
- Bilingual reporting adds complexity

## Problem

- HESA outputs = CSV/Excel, hard for non-technical staff
- Delays, bottlenecks, reactive data quality process
- Industrial Partner: UWTSD (MIS Data Team)



# Rationale

## Why this project matters



Student data → funding, compliance, planning  
Poor data = funding risk, reputational damage  
Self-service BI tools could empower non-technical staff

## Alignment

Supports HESA Data Futures (real-time monitoring)  
Fits digital transformation in HE

# Literature Review (Academic)

**Data Quality**  
(Wang & Strong,  
1996; Batini &  
Scannapieco,  
2016)

- Accuracy, completeness, consistency, timeliness

**Business Intelligence in HE**

- BI dashboards → decision-making, efficiency (Sorour et al., 2019; Hmoud, 2023)

**Learning Analytics Case Studies**

- Dashboards improve retention & student success (Dawson et al., 2018; Knight et al., 2020)

# Literature Review (Industry & Policy)

**HESA Data Futures** → continuous monitoring, technical outputs (HESA, 2021)

**Jisc / EDUCAUSE** → stronger data governance & self-service analytics (Jisc, 2021; EDUCAUSE, 2019)

**Gartner (2022)** → self-service BI as sector trend

**Policy Context** → Welsh bilingual reporting (Welsh Gov, 2020)

A large orange circle is positioned on the left side of the slide, partially cut off by the edge.

# Research Gap

Dashboards widely studied for learning analytics & management but little focus on compliance/data quality monitoring

Existing HESA validation outputs are technical and inaccessible to non-IT staff

Gap - No self-service dashboard for HESA rule compliance in Welsh HE

A blue dashed line is located in the bottom right corner of the slide, consisting of several short, curved segments.



# Aims & Objectives

**Research Question:** How can a dashboard help non-technical staff monitor HESA data quality?

**Aim:** To design and evaluate a self-service BI dashboard that enables non-technical staff to monitor and improve student data quality.

## **Objectives:**

- Identify & map HESA validation metrics
  - Develop dashboard prototype (Power BI / SQL)
  - Test with MIS staff using System Usability Scale (SUS)
  - Evaluate effectiveness in improving monitoring & reducing IT reliance
  - Recommend future scaling & integration with Data Futures
- 

# Methodology Overview

- Philosophy: Mixed (Positivism + Phenomenology).
- Approach: Deductive (theory-driven) + inductive (staff feedback).

## **Strategies:**

- Literature review
- Software development
- Case study (UWTSD)



# Methodology (Data Collection & Evaluation)

## Primary data:

- SUS surveys (3–5 MIS staff)
- Short interviews/surveys (qualitative feedback)

## Secondary data:

HESA rules, Jisc/Medr guidance

## Evaluation

Quantitative: SUS scores (benchmark  $\geq 70$  = good usability)

Qualitative: Thematic analysis (Braun & Clarke, 2006)



# Project Design

---

**Architecture Workflow:** SQL + Power BI pipeline.

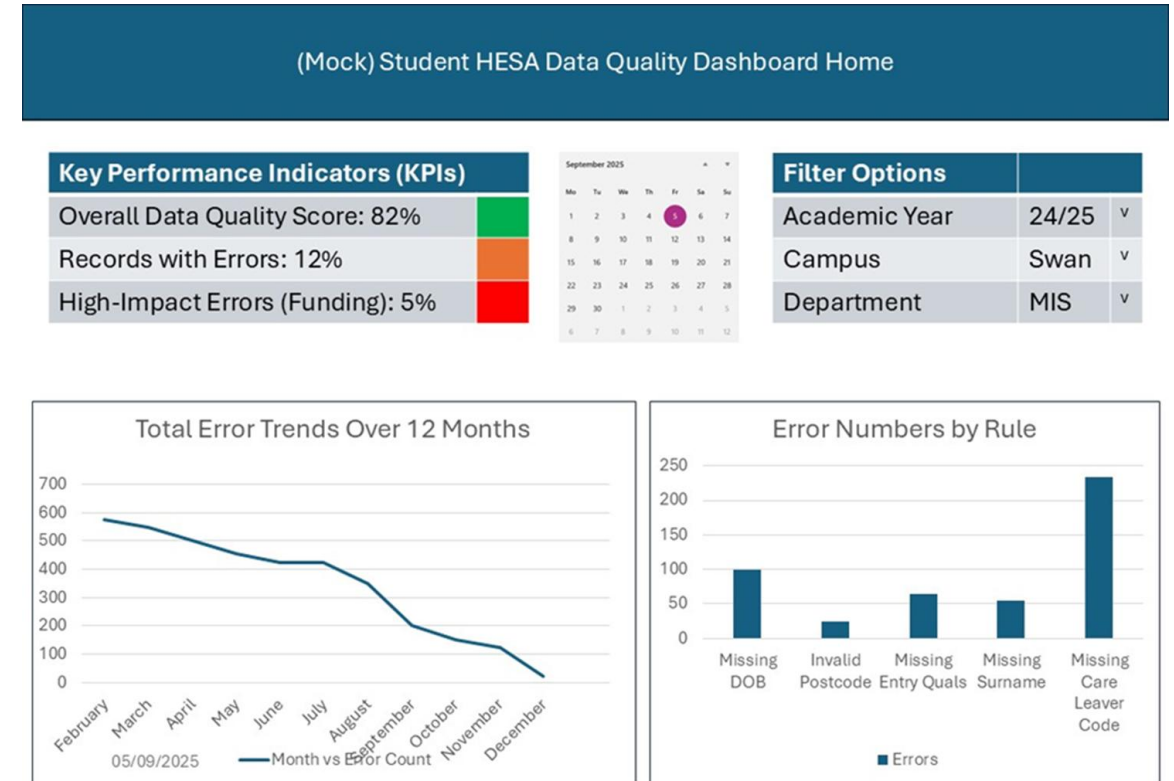


# Project Design

## Wireframe

Dashboard landing page with:

- Traffic-light summary
- Drill-down table
- Error trend chart



# Resources & Planning



**Hardware:** University PCs/laptops



**Software:** Power BI, SQL, Excel, NVivo, SPSS (all under university license → no extra cost)



**Human resources:** 3–5 MIS team members

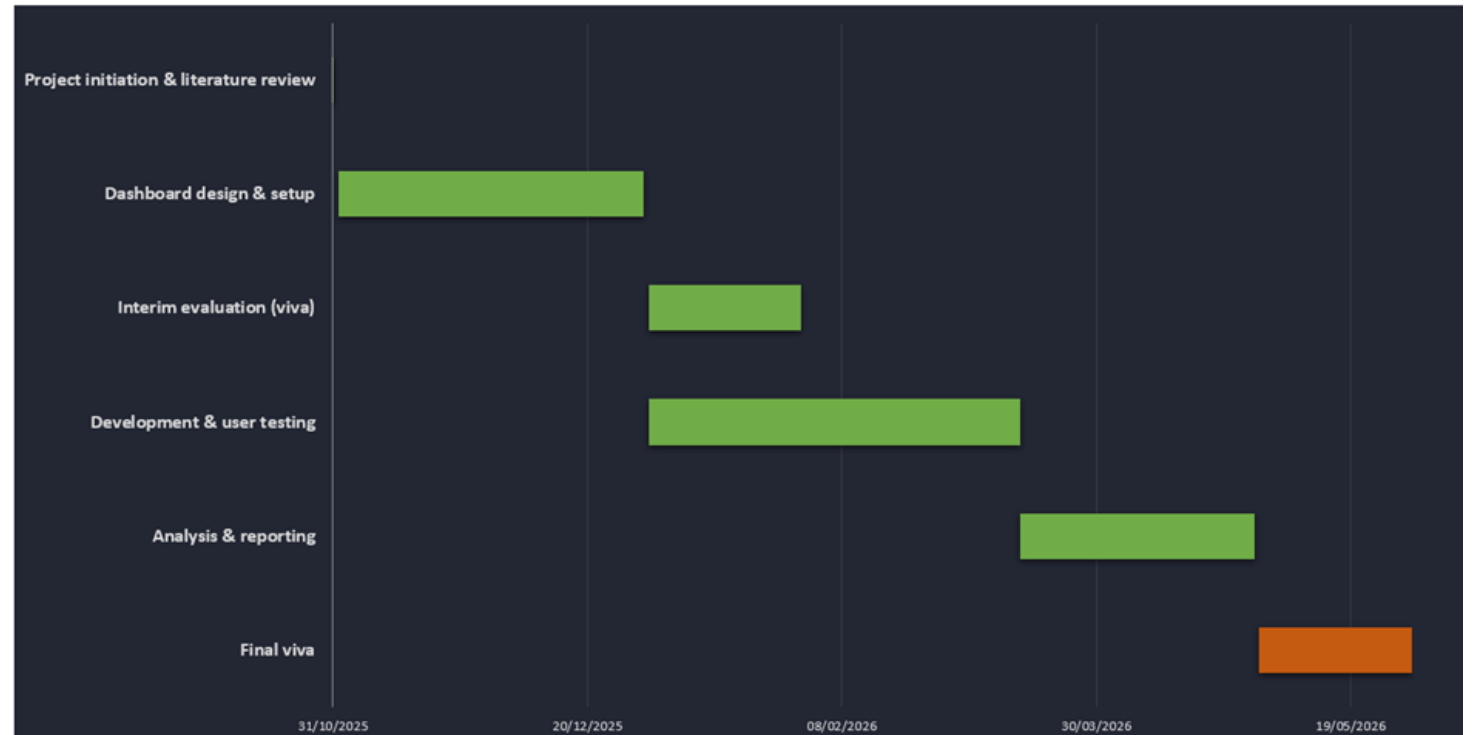


**Information resources:** HESA rules, anonymised datasets

# Project Plan

---

- Sept–Oct: Lit review, proposal finalisation
- Nov–Dec: Dashboard prototyping
- Jan: Interim evaluation
- Jan–Mar: User testing, SUS surveys
- Mar–Apr: Analysis & dissertation write-up
- May: Final viva



# Project Impact

## Institutional Impact (UWTSD)

- Faster error resolution
- Reduced reliance on IT specialists
- Lower compliance risk

## Sector Impact (Wales/UK)

- Aligns with HESA Data Futures
- Transferable model for other institutions

# Limitations

---

MVP prototype only

---

Small participant sample

---

Single institution case study

---

Limited time/resources

# Future Development



Scale to multiple institutions



Integrate with HESA Data Futures system



Extend to staff and finance data



Any questions

# References

- Batini, C. and Scannapieco, M. (2016). *Data and Information Quality: Dimensions, Principles and Techniques*. Cham: Springer.
- Braun, V. and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), pp.77–101.
- Dawson, S., Richardson, P.J. and Macfadyen, G. (2018). Learning analytics and dashboards: Impact on student success. *Computers & Education*, 126, pp.1–10.
- EDUCAUSE (2019). *The State of Data Governance in Higher Education*. Available at: <https://library.educause.edu> [Accessed 15 Aug 2025].
- Gartner (2022). *Magic Quadrant for Analytics and Business Intelligence Platforms*. Stamford, CT: Gartner.
- Higher Education Statistics Agency (HESA) (2023). *Student Data and Validation Guidance*. Available at: <https://www.hesa.ac.uk> [Accessed 4 Aug 2025].
- Higher Education Statistics Agency (HESA) (2021). *Data Futures: Programme Update*. Available at: <https://www.hesa.ac.uk/innovation/data-futures> [Accessed 9 Aug 2025].
- Hmoud, H. (2023). Factors influencing business intelligence adoption by higher education institutions. *Procedia Computer Science*, 222, pp.1789–1798.
- Jisc (2021). *Digital Transformation in Higher Education: Realising the Potential of Data*. Available at: <https://www.jisc.ac.uk/reports> [Accessed 4 Aug 2025].
- Knight, R., Buckingham Shum, M. and Littlejohn, S. (2020). Learning analytics: A dashboard beyond numbers. *British Journal of Educational Technology*, 51(5), pp.1439–1455.
- Sorour, A., Stanier, C.F. and Atkins, A.S. (2019). The Role of Business Intelligence and Analytics in Higher Education Quality: A Proposed Architecture. In: *Proc. IEEE Global Engineering Education Conf. (EDUCON)*, Porto, Portugal, Apr. 2019, pp.1–5.
- Wang, Y.W. and Strong, D.M. (1996). Beyond accuracy: What data quality means to data consumers. *Journal of Management Information Systems*, 12(4), pp.5–34.
- Welsh Government (2020). *Welsh Language Standards (Higher Education)*. Available at: <https://www.gov.wales> [Accessed 4 Jul 2025].
- Welsh Government (2024). *Commission for Tertiary Education and Research (Medr): Policy and Guidance*. Available at: <https://www.gov.wales> [Accessed 4 Aug 2025].