A Hybrid Retrieval System for Democratising Institutional Operational Knowledge Among Foundation Doctors

Joint Foundation Sharing Best Practice Event

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Background

89% of foundation doctors report patient care delays from missing contact information - can hybrid search fix it?

Every August, ~50,000 foundation doctors rotate simultaneously across the NHS.[1,2] New F1s arrive facing not just clinical challenges, but a hidden operational burden: *how do I actually contact the right person, right now?*

Departmental induction rarely covers practical logistics — bleep protocols, extension numbers, referral pathways, out-of-hours escalation pathways.[3] Instead, doctors must navigate the hospital switchboard queue or rely on the goodwill of busy colleagues.[4]

At our trust, we found:

- **89%** reported that difficulty finding contacts had delayed patient care
- Ease of locating operational information scored just **2 out of 7**
- **67%** asked colleagues for help with basic logistics ***every single day***

Existing solutions: printed handbooks, PDF directorie and, the hospital switchboard are static, keyword-dependent, and outdated within weeks.[4,5]

Methods

This prospective, single-centre quality improvement project at University Hospitals Dorset NHS Foundation Trust evaluated a custom information retrieval tool designed to improve access to operational knowledge for foundation doctors.

Participants self-registered on the web application and received a pseudonymous four-character access code, ensuring voluntary and anonymous participation. No patient data were collected or processed.

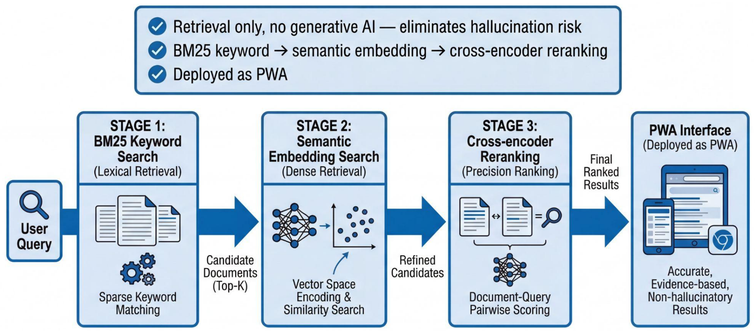

Figure 1: illustration of the search process

Study design:

- Pre-post survey with concurrent usage analytics over 11 days
- n = 27 foundation doctors (19 FY1, 8 FY2) across two hospital sites
- Baseline survey captured ease of information access, care delay frequency, and colleague reliance
- Post-use confidence survey completed by 25 participants
- Wilcoxon signed-rank test for paired ordinal data; usage metrics reported descriptively

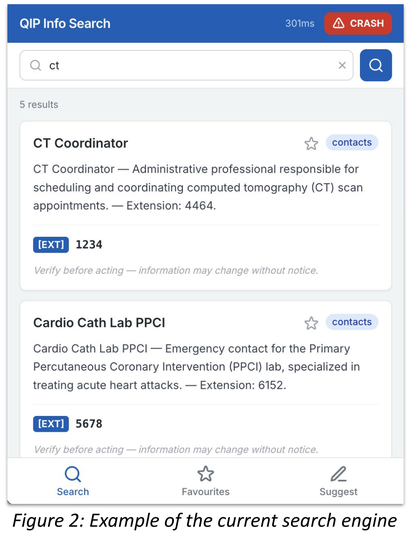

Figure 2: Example of the current search engine

Try our demo

Results

Before the intervention, foundation doctors described a workplace where finding basic operational information was a daily struggle with direct consequences for patients.

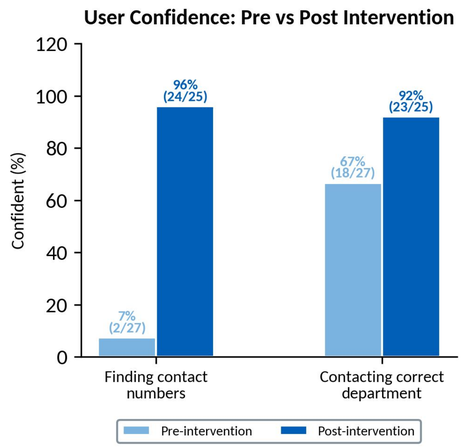

Figure 3: Clinical escalation confidence pre and post intervention, specific to operational knowledge

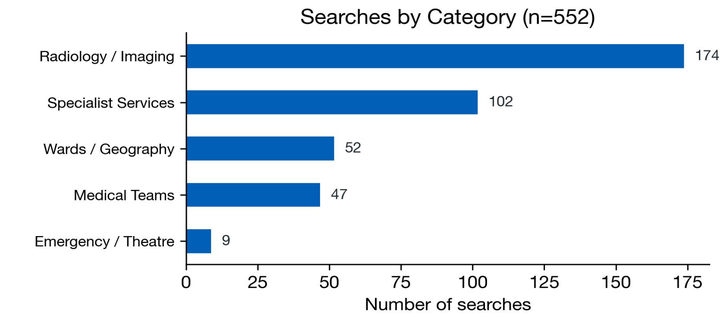

Figure 4: Most common inputs on the current search engine

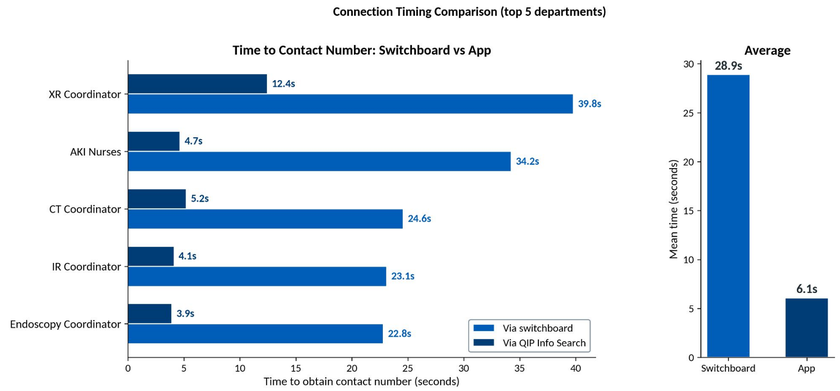

Figure 5: Comparison of the time taken to connect to the most frequently searched departments with and without use of the search engine tool.

Key metrics:

- **89%** of registered users actively searched during the evaluation period
- **0%** zero-result rate - every query returned relevant results from the 552-entry knowledge base
- **100%** of live queries returned in under 500ms (median 332ms)
- **55%** of queries served from cache - users returned repeatedly rather than memorising numbers, consistent with desirable cognitive offloading

5 user-submitted knowledge gaps (ITU bleeps, theatre coordinators, consultant secretaries, updated ward names, OPAT service) were identified through the built-in feedback mechanism and incorporated within 48 hours demonstrating a model of **living, user-driven knowledge curation** that static handbooks cannot offer.

Key Messages

The operational knowledge gap is measurable, common, and fixable.

- Immediate steps: Improvement of current search outcomes through feedback from a larger user interface
- Long term steps: Multi-site deployment, formal retrieval evaluation, semi-automated knowledge base maintenance

References

(1) Jen MH, et al. Early in-hospital mortality following trainee doctors' first day at work. PLoS One 2009;4(9):e7103. (2) Gaskell N, et al. Putting an end to Black Wednesday: improving patient safety by achieving comprehensive trust induction and mandatory training by day 1. Clin Med (Lond) 2016;16(2):124–128. (3) Michaelides A, et al. Assessing the preparedness of foundation year 1 (FY1) doctors during the transition from medical school to the foundation training programme. BMC Med Educ 2020;20(1):106. (4) Houston J, et al. Sharing knowledge, saving time: an online toolbox to aid junior doctors. BMJ Qual Improv Rep 2014;2(2):u200583.w651. (5) Wickramanayake U, et al. Introducing an emergency department electronic handbook to junior doctors new to emergency medicine. Cureus 2024;16(8):e66313.