

# Richard J. Doherty

## Senior Data Analytics & SQL Specialist · Applied Data Scientist (MSDS)

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### CASE STUDY · APPLIED DATA SCIENCE

## Machine Learning on Clinical & Operational Data — Robotic Surgery Medtech

Data Scientist · IMRA Surgical (via RMIT University) · Melbourne · 2023

### THE CONTEXT

IMRA Surgical develops robotic surgical systems — one of the highest-stakes, most heavily regulated environments in which data science operates. As data scientist on the engagement, I worked with clinical and operational datasets where data quality, traceability, and sound evaluation are not optional: a misleading insight has real-world consequences.

The brief was the kind most analytics work actually involves — take complex, multi-source operational data and produce findings the engineering and clinical teams could trust and act on.

### WHAT I DID

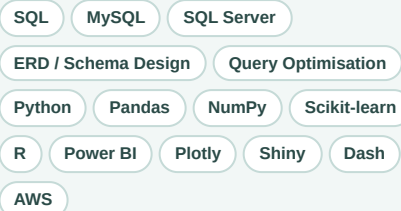
- ▶ **Structured the data foundation.** Profiled and cleaned multi-source datasets, resolved quality and consistency issues, and built reproducible pipelines so analysis rested on a reliable base — the same discipline I apply to app, web, and product data.
- ▶ **Built & evaluated ML models.** Developed and tested machine-learning models in Python (Pandas, NumPy, Scikit-learn), with disciplined attention to evaluation, error analysis, and where models fail — essential in a regulated medical-device setting.
- ▶ **Translated for non-specialists.** Bridged the gap between the data work and clinical / engineering stakeholders, framing results so decision-makers understood not just the output but its limits and confidence.

### HOW I APPROACH ANY ANALYTICS ENGAGEMENT

- 1 Start with the decision, not the data.**  
Clarify what question the team needs answered and what they'll do differently once they know — so the work moves a metric, not just fills a report.
- 2 Get the data trustworthy first.**  
Profile, clean, and model the sources in SQL; expose quality issues early rather than letting them quietly skew the answer.
- 3 Analyse, then pressure-test.**  
Run the analysis or model, then actively look for where it breaks before anyone else does.
- 4 Deliver an answer, not a query.**  
Clear visuals and a plain-language read-out, with confidence and caveats stated honestly.

*Note: specific datasets and results from this engagement are confidential. This case study describes methods and approach only — consistent with how I handle all client data.*

### CORE TOOLKIT



### TRACK RECORD IN NUMBERS

**25+** years working with enterprise data & SQL systems

**MSDS** Master of Data Science, RMIT (2023)

**6 yrs** teaching SQL, database design & analytics at university level

**5.9/6** avg. student rating for explaining complex data concepts clearly

### WHY IT MATTERS HERE

You're hiring for app, web, and AI/ML data analysis. The medtech work proves I can handle messy, sensitive, high-consequence data and still deliver insight people trust — and do it remotely.

*Took foreign concepts I had no experience with and made them incredibly simple to understand.*

— Student evaluation, database / SQL course