The Royal Wolverhampton NHS Trust

AI-Enabled Rota Automation: Making Radiology Scheduling Simple

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Background: Registrar rota preparation is traditionally manual, time consuming, and prone to scheduling conflicts. Ensuring fair duty allocation requires repeated checking and administrative oversight requiring time.

We developed a safe, deterministic, and easy-to-use rota engine to automate scheduling while maintaining fairness and accuracy.

Methods:
A Python based deterministic rota engine was developed.
Registrar unavailability was collected via Microsoft Forms using AM/PM session level responses and exported to Excel.
The workflow applied strict rules:

- Read unavailability exactly as submitted
- Make no assumptions
- Automatically skip weekends and exclude UK bank holidays
- Leave sessions blank if no registrar available
- Assign duties using a balanced distribution method

A complete monthly rota was generated in under one minute without manual adjustment

Results:
The engine was evaluated through structured test runs and real-world departmental implementation.
Across testing and live deployment:

- No scheduling conflicts occurred
- Full adherence to declared unavailability was maintained
- Fair duty distribution was consistently achieved
- Blank sessions were clearly flagged for administrative follow-up
- Preparation time reduced from hours to minutes

The workflow proved reliable, transparent, and reproducible in routine practice.

Conclusions & Future Direction:
A deterministic AI-supported rota engine can significantly reduce the time and effort required to generate registrar rotas while maintaining safety and fairness.
The system is practical for routine departmental use and requires minimal technical expertise.
Planned developments include:

- A simplified graphical user interface
- Operation without direct Python interaction
- Adaptation to consultant and other multidisciplinary team rotas

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