



Clinical Roster Optimisation Service Definition

G-Cloud 15

info@medmodus.com
www.medmodus.com

MedModus - The partner of choice for hospitals producing fairer rosters while maximising hospital capacity to deliver care.

Table of Contents

Why Roster Optimisation?	4
Clinical Roster Optimisation	4
Measurable Benefits	5
About MedModus	6
Our Customers	6
Onboarding and Training	8
Information Security Rigour	8
Service Levels	8
Technical Requirements	8
Hosting Options and Locations	8

1. Why Roster Optimisation?

The NHS faces persistent clinical staff shortages, with overstretched doctors supporting a growing and ageing population. In this context, it is essential that clinical rosters, particularly on-call rosters, are both fair and effective.

Fair rosters distribute shifts evenly, maximise rest gaps, avoid excessive consecutive weekends on-call, respect clinician leave requirements and are compliant with national standards.

Effective rosters maximise the availability of doctors within their specialty teams to safely deliver care.

Achieving both fairness and effectiveness becomes increasingly challenging in complex hospital environments involving multiple staff grades, specialties, and service

constraints. In our experience, even where electronic rostering systems are in place, they fail to deliver optimised outcomes. This is because many systems apply rules sequentially and cannot balance the full set of competing constraints required in large or complex services.

As a result, responsibility for producing these rosters frequently falls to clinicians or managers who rely on manual processes, often using spreadsheets outside formal rostering systems. This approach is time-consuming, difficult to govern, and typically results in rosters that remain sub-optimal for both staff and service delivery.

Our Roster Optimisation Web App uses advanced optimisation and AI techniques to balance fairness, availability and service requirements, producing high-quality complex rosters at scale.

2. Clinical Roster Optimisation

Our web app is designed to deliver **safe, fair, and compliant rosters** by navigating a complex set of national standards, organisational objectives, and specialty-specific requirements. Our approach combines automation with flexibility, ensuring each roster satisfies generic rules while accommodating local and role-specific constraints.

2.1 Key Objectives

The Web App will:

- Ensure staff are **well-rested and not overburdened**, in line with national regulations.
- **Distribute work and call duties fairly** across time and staff.
- Honour staff **availability, leave, and personal preferences**.
- **Maintain service continuity and clinical safety** by avoiding team-wide absences and ensuring appropriate skill mix.
- Adapt to **staff changes** (e.g. onboarding, departures) and unique scheduling constraints per role or specialty.
- The Web App handles a combination of core scheduling rules and a set of rules that are service specific.

2.2 Core Scheduling Rules

Core rules include:

Regulatory Compliance

- Ensure rest days after long runs of shifts.
- Avoid consecutive weekend allocations.
- Distribute night/weekend calls fairly and evenly.

Fairness and Equity

- Balance number and type of calls (day/night, weekday/weekend/bank holiday).
- Factor in historical allocations to ensure fairness across periods.
- Adjust for availability, WTE (whole-time equivalence), and part-time work.

Leave and Availability

- Exclude staff from shifts during approved leave or off-site periods.
- Block call allocations immediately before/after leave.
- Honour recurring "no call" requests.
- Ensure set time off is factored e.g., clinic every Monday.

Team and Specialty Clashes

- Avoid scheduling multiple doctors from the same team to be on leave, post-call, or on call at the same time, to preserve team coverage and continuity of care.
- Optimise across linked rosters and cross-covering specialties.

New and Departing Staff

- Restrict complex allocations for new starters and limit weekend calls for those leaving.

2.3 Service-Specific Rules

The Web App supports highly tailored rules for individual services. Examples include:

Medical Junior Doctors

- Special handling/limited call and specific rules for:
- Doctors in Acute Medical Units or similar units.
- Doctors with off-site duties.
- Complex rotation logic for doctors covering multiple specialties.

Surgical Teams

- Orthopaedic/surgical allocations balanced by subspecialty needs.
- Consultant elective lists integrated to avoid clashes with call duties.

Anaesthetic Teams

- Skill-mix safeguards in Critical Care (ICU/ITU) to ensure safe on-call pairings.
- Call limitations for fellows and junior staff.
- Defined rest periods post-call, especially after weekends.

ICU Consultants

- Simultaneous planning for ICU and theatre duties.
- Continuity of care rules.
- Strict rest, call timing, and theatre-exclusion rules.
- Limits on shift fragmentation and theatre-ICU crossover.

Radiography Services

- Fairness rules to ensure equitable call distribution in current roster period and consideration of previous period.
- Fine-tuned WTE calculations per modality (e.g. X-ray, CT).
- Spacing rules for paid/unpaid call duties and shifts over time.

The Web App's optimisation engine considers these core and service specific rules and produces an optimal roster. Once produced the roster can be uploaded to your rostering system. The web app is also an integrated module in MedModus' Roster Management System (see separate G-Cloud 15 service definition document).

3. Measurable Benefits

Optimising for fairness and improved availability

Our roster optimisation web app drives measurable improvements in roster fairness and clinician availability across multiple services. A comparative analysis of one NHS Trust's medical on call rosters created manually versus one created using our optimisation engine is

shown in the table below. The optimisation engine reduced instances of suboptimal rest and availability factors by 99% - from 196 instances in a 3-month on-call roster to 2 instances.

# Instances of ...	NHS Trust	MedModus
Consecutive weekends of call	19	0
<4 week gap between nights	20	0
<7 day gap after Mon - Thurs night shifts	2	0
<7 day gap after Fri - Sun night shifts	10	0
Suboptimal Clinician Rest Factors	51	0
>1 team member on nights at same time	4	0
>1 team member on nights/posts at same time	21	0
>1 team member on leave/rest at same time	101	2
>2 team members away	19	0
Suboptimal Clinician Availability Factors	145	2
Overall	196	2

Table 1 – Comparative Roster Quality Analysis NHS Trust and MedModus

Saving Time

Roster generation exercises done manually can take at least a week at a time, often longer due to change requests and related adjustments. The web app reduces this to minutes and ensures a much higher quality result.

Meeting Deadlines

There is time pressure related to roster generation. Staff need to know their on-call commitments and there is a 6-week deadline for providing rotating junior doctors with their duty rosters. The web app helps ensure these deadlines are met.

Reacting to Last Minute Changes

With manually created complex rosters, even a simple change can be challenging. For example, removing a doctor who is no longer available and filling the vacant shift slots created can take days to consider. The web app will allow this to be done quickly before call rosters are shared.

Considering Leave Preferences

The web app considers leave preferences in advance of producing complex rosters. Considering leave preferences upfront results in rosters that are demonstrably more equitable, more acceptable to clinicians, and less likely to require post-hoc manual adjustment or swaps. It can also reduce the need for locum cover.

MedModus offers free comparative analysis exercises to prove these benefits to you.

4. About MedModus

At MedModus, our mission is to transform the rostering of healthcare staff and resources through the strategic use of technology — including advanced software, data analytics, AI, and automation. We enable hospitals to move from manual, fragmented scheduling to a structured, data-driven approach that delivers optimal outcomes.

By embedding intelligent, automated processes into rostering, we help healthcare providers achieve:

- Satisfied, well-supported staff
- Full utilization of capacity and services
- Minimized errors and operational risks
- Improved patient safety
- Transparent, accessible rosters as a single source of truth
- Accurate analytics to drive continuous improvement

Our offering comprises three core, integrated services:

- Roster Optimisation Web App – Advanced optimisation engine handling numerous rules to generate balanced, compliant, and efficient rosters.
- Roster Management System (RMS) – A user-friendly platform to manage day-to-day scheduling, leave, communication and drive capacity utilisation.
- Roster Design – Support for reconfiguring rosters and services to meet strategic and operational goals.

5. Our Customers

Our implementations span hospital departments where complex rostering presents challenges. These include medicine, surgery, anaesthesia, radiology and radiography.



6. Onboarding And Training

Web app set up is straight forward and we provide a responsive managed service to support it. Our team will meet with you to understand your rostering challenge and ensure the app is configured to meet your requirements. Following brief training, you upload staff information, roster information and leave preferences and other

rules that need to be met via a user-friendly interface. The app's optimisation engine will produce an optimal outcome. Our support team of experienced rostering analysts will also assist with any questions you may have or bespoke design requirements as they arise.

7. Information Security Rigour

MedModus is ISO/IEC 27001:2022 accredited and Cyber Essential certified. We maintain a rigorous Information Security Management System (ISMS) defined by over thirty policies in areas like information security, data

protection, risk management, business continuity, disaster recovery and access control. Further information on our ISMS can be provided on request.

8. Service Levels

We understand the pressures that come with producing timely optimised duty rosters. Our support team is on hand to help answer questions you may have. MedModus provides telephone and online ticketing support according to the following SLA response times.

Priority	Acknowledgment	Response*	Resolution Time
High	Immediate	<1 hour	<3 hours
Medium	Immediate	<24 hours	<24 hours
Low	Immediate	<48 hours	<72 hours

*Monday to Friday, 8am – 8pm, with out of hours support for high priority infrastructure-related tickets

Roster design query response times depend on the complexity of the request and timelines for redesigns are agreed with you.

9. Technical Requirements

As a Software-as-a-Service (SaaS) solution, all that is required is a reliable internet connection and a modern browser. A monitor with a 16:9, 16:10 or 3:2 aspect ratio is recommended. Screen resolution with a width higher

than 1500 is recommended. There is an option to restrict access to the application through public networks, if required by the customer.

10. Hosting Options and Locations

MedModus uses Microsoft Azure as its cloud hosting vendor and as such, it allows for services and resources to be hosted within multiple regions world-wide, including EU/EEA and the United Kingdom. For the UK, it provides the following locations: UK South (London), UK West (Cardiff).





info@medmodus.com
www.medmodus.com