A planning and scheduling tool for operating theatres of a multi-site hospital

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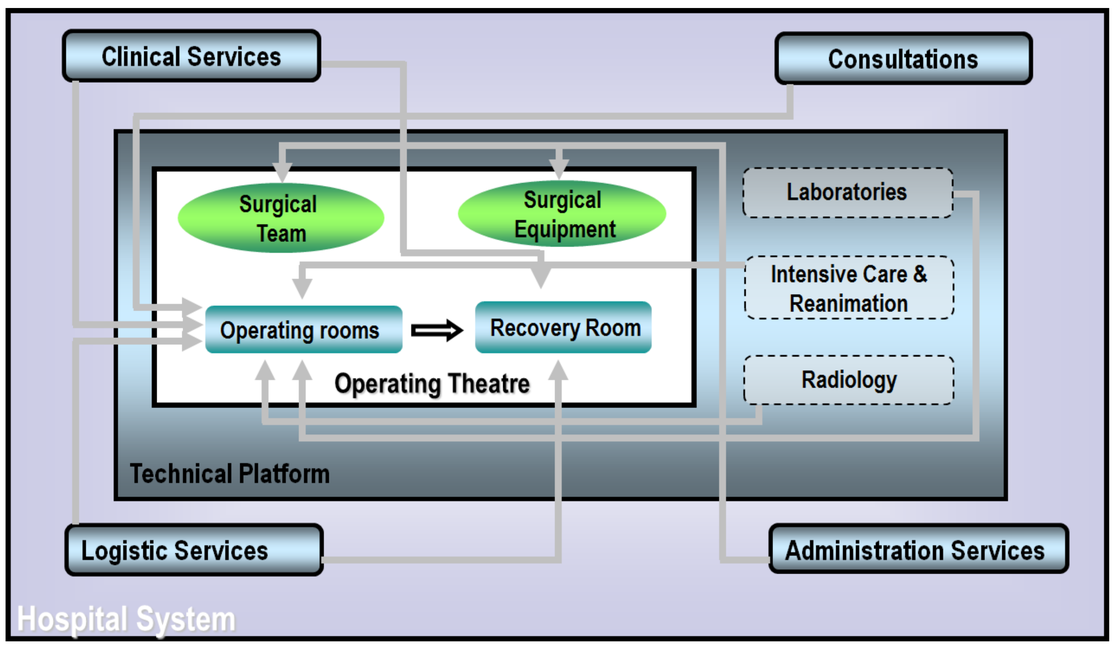
Context

- increasing number of stays
- shorter and shorter duration of stays
- increased requirement of service
- more and more severe legislative constraints
- budgetary constraints
- ...

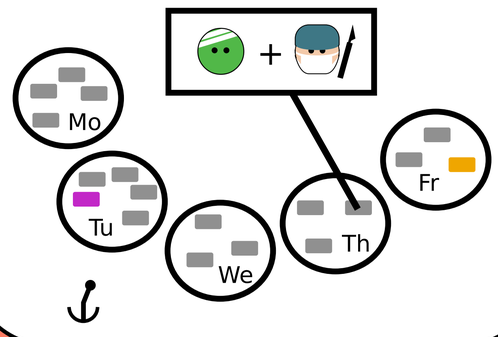
→ Need to improve the efficiency and the productivity of hospital services

Hospital system

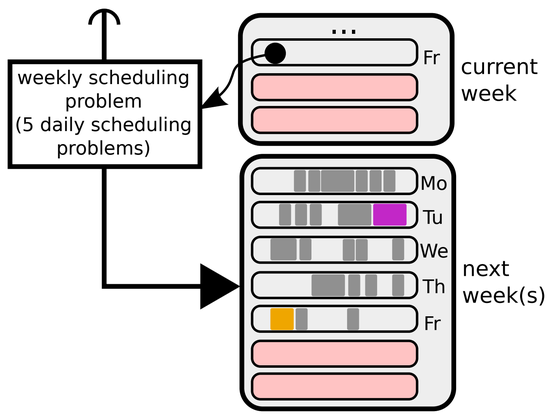


Planning

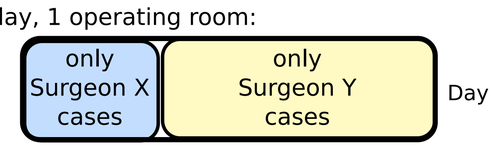
diabetic or child patient
nosocomial infection risk



Scheduling

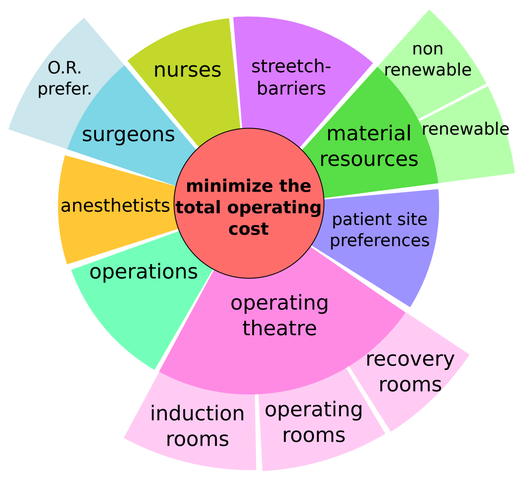


1 day, 1 operating room:

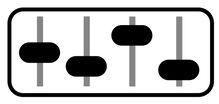


"block scheduling" strategy

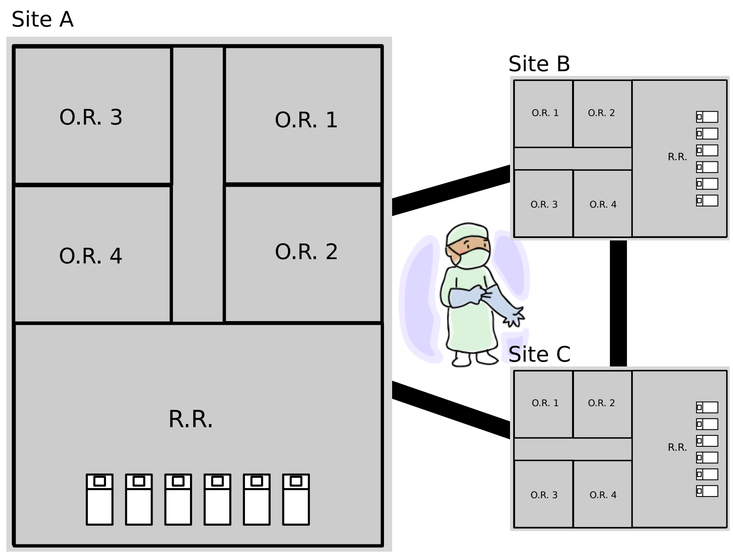
Multiple constraints for one site



multi criteria fixed by the decision makers

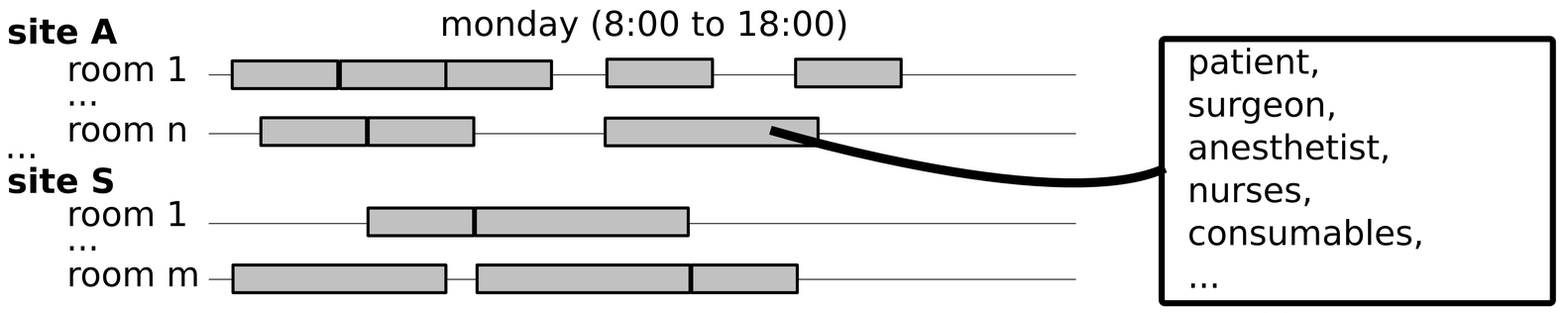


Resources shared on multiple sites



O.R.: operating room R.R.: recovery room

Sample of wanted schedule for each day of the next week



Hybridization of MIP and simulation

appropriate for a limited-time decision making in the context of planning and scheduling operating theatres

simulation
- discrete event formalism (DEVS)
- intuitive writing of simulation models
- can reduce a research domain or test robustness
- multi-scale and multi-formalism approaches
- embedded local optimizations for scheduling, dispatching rules...

MIP
- minimize or maximize a linear function subject to linear constraints
- well-known resolution methods (Branch & Bound,...)

M.I.P.: Mixed Integer Programming