CHILDREN'S HOSPITAL COPENHAGEN

THE FLEXIBLE SURGERY WARD

AN INTERDISCIPLINARY APPROACH

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For the European Healthcare Design 2018 Congress & Exhibition, London UK

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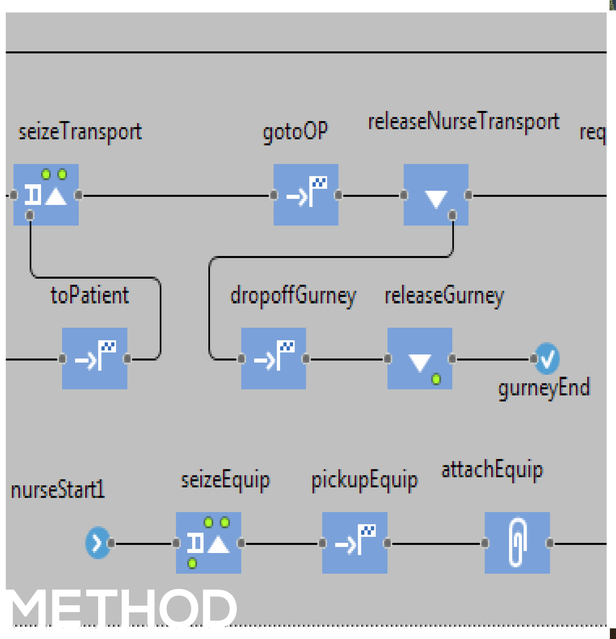
INTRO & OBJECTIVE

Copenhagen University Hospital, one of Denmark's largest and most highly specialized hospitals, has a bold ambition: building the world's best hospital for children, young people and women giving birth. The new hospital, Children's hospital Copenhagen, is set to open in 2024.

Traditions within architecture, functionality and patient care delivery will be challenged. Innovative thinking is promoted through the establishment of multidisciplinary teams.

A main challenge exists in balancing diverse healthcare professionals' interests, while making the most of available capacity, logistics and resources *(humans and machinery)*.

The working procedures at the surgical ward will undergo radical changes and is thus apt for further analysis.



METHOD

A discrete event simulation study was conducted to assess utilization of pre- intra- and post operative capacity.

The study drew upon historical quantitative data on patient arrivals, processing times, diagnostic equipment usage and more.

The modelling process involved multiple iterations between clinicians and administrative staff *(for improved validity)*

Simulation modelling made scenario testing possible, where the number of operating theatres, bed capacity, staff and opening hours were variables.

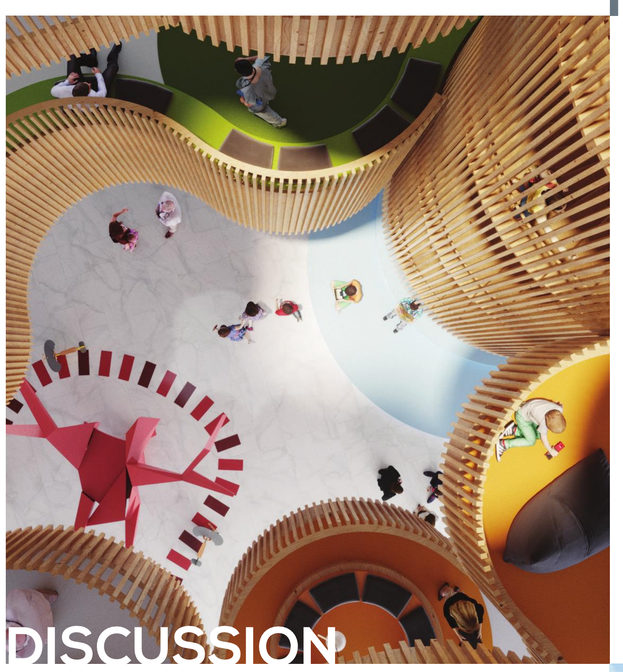
The simulation results and the debate around them fostered new ideas for supply chain management and enhanced patient pathways.

RESULTS

The **LOGISTICAL CONCEPTS** support the project's softer values by first understanding them and enhancing the user experience through choices of both concepts and product solutions.

The **DESIGN THINKING** comes from the role of the architects on the client side and seeks to find the best compromise between all considerations and expert assessments to deliver more precise feedback to the external entrepreneurs.

An **INTERDISCIPLINARY COLLABORATION** between architect, logistical expert and data engineer provides a solid foundation for guiding physical layout considerations, highlighting potential bottlenecks and assessing impact of new working procedures on selected outcome parameters.



DISCUSSION

The developed simulation model is readily flexible and can be extended to include human resource rostering and in-depth equipment utilization.

Data-driven decision making in close collaboration with logistical and design advice is deemed highly valuable, especially in testing critical layout decisions.

Quantitative analysis of patient flows should be considered *(utilizing process mining on activity data)*.

Note that simulation programming requires expert knowledge to yield sound results and development time is long.

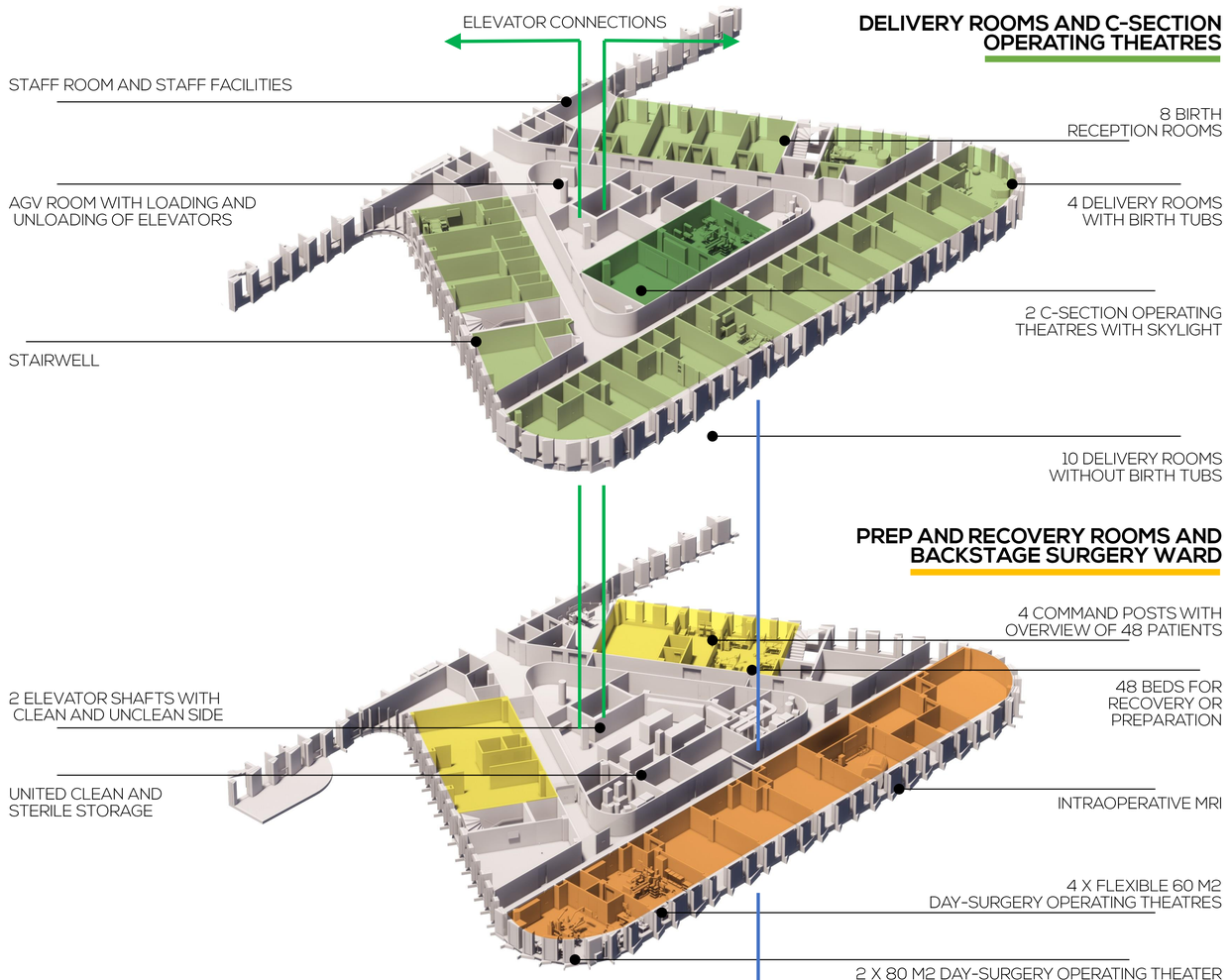
Simulation studies are sensitive when prone to drastic changes in layout or internal processes.

CONCLUSION

Clear synergy in grasping experts within logistics, design and mathematical modelling. Simulation results was proven to be a highly engaging technique between the authors and other healthcare professionals; impact on hypothesized changes can be assessed instantly. The entrepreneurs can be informed on important layout decisions on an improved foundation.

PRINCIPLES OF THE TREATMENT BASE

HOW ONE OF THE PROJECT'S BIGGEST CHALLENGE WAS TURNED INTO A STRENGTH AND INNOVATIVE SOLUTION



SAME LOGIC AS COMPETITION PROPOSAL, BUT WITH ADDED RATIONALITY, BUT SERIOUS CHALLENGES FOR EFFECTIVE LOGISTICS.
EARLY PROPOSAL
SEPTEMBER 2017

OPTIMIZING AND SHRINKING THE PROJECT AROUND 5.500 M2, LED TO THE NEED FOR MAJOR CHANGES. WE CLOSED THE COURTYARD, AND MADE ROOM FOR MORE EFFECTIVE LOGISTICS.
REVIZED PROPOSAL
JANUARY 2018

EXTRA ROOM FOR LOGISTICS ARE USED TO CREATE AN EFFECTIVE AND HIGHLY AUTOMATED FLOW OF SUPPLIES AND GOODS TO ALL DEPARTMENTS IN THE ENTIRE TREATMENT BASE.
CURRENT PROPOSAL
MAY 2018