In recent years, many studies have revealed the increasing rate of hospital obsolescence: this fact is a reflection of the need to modernize a legacy healthcare system with obsolete technologies and services. The need to re-engineer health facilities with a focus on long-term investment and technological experimentations in the near future (2030).

ABSTRACT

Hospitals are old as soon as they are built. Public hospitals take a lot of time from design to construction due to its size and technological complexity. Hospitals evolve with the fast pace at which contemporary society and medical knowledge evolve. In this environment, the need to have structures that are flexible and able to update their services in time is crucial.

The Open Room is a research group that has designed a prefabricated healthcare facility that is able to transform immediately the healing environment. The group is interested by the project.

The research foster multidisciplinarity and involves different stakeholders to favor the ability of a structure to change its functions and activities globally, meet the needs related to the fast evolution and the peculiarities of hospital resilience to economic, social and health aspects, as well as ensure that the system services and support long-term investment and technological experimentations in the close future (2030).

The Concept Development

A sequence of operations to innovate healthcare facility design process

The Design Definition

Interior design and preliminary technological definition

The Strategic Perspective

A hospital that is able to embrace the changes with resiliency and flexibility

The Technological Evolution

Space, implants and structure for a feasible innovative design

Modularity and Customization

Finishing elements for a functional, customizable and safe environment

The Problem

The Proposed Solution

THE RESEARCH QUESTION

One of the most important challenges that architectures for health must address is to be resilient to economic, social and health changes, as well as to make the medical services and management and organization flexible and able to change its structure in functions and organizing, in the strict evolution of the future, based on local cultural and social requisites.

To deal with this need, among the constant surface flexibility strategies, starting from the Open Building approach, a research group developed the Open Room approach based on prefabricated rooms with the aim of optimizing installation and construction time.

Starting from the current knowledge in Open Building, the Open Room is structured by:

- Primary system: with the modules plugged into the structural framework.
- Secondary system: through the Open Grid approach, regardless the pre-defined role functions of the skeleton with all the implants and needs for all the process of medical practice. The Open Room system that distributes both the functions and all the technical elements and allows to transform immediately the healing environment.

The research foster multidisciplinarity and involves different stakeholders, potentially interested in the project.
Night

Design reviews and production costs and their spatial and architectural features. The analysis of the environmental units allowed to understand the different requirements, as well as the economic process to improve the healthcare environment.

In the contemporary society, several market and real estate fields are radically transforming. From the economic point of view, the prefabricated strategy can allow cost reduction not only in site construction, but also in maintenance actions (macro or micro operations) or hospital activities. The second module can now be placed inside the substructure, with its open and resilient to the hospital structure. The second module can also be lifted and put in place like the first one as the workers continue the joining process, also between the different modules themselves, as all the necessary processes are performed in an off-site industrial facility. The second module can now be placed inside the substructure, with its open and resilient to the hospital structure. The second module can also be lifted and put in place like the first one as the workers continue the joining process, also between the different modules themselves, as all the necessary processes are performed in an off-site industrial facility.

The prefabricated approach, the construction system will be very different from the traditional approach. It is inspired by the growing tendency of placing prefabricated bathrooms in healthcare facilities, and the other is to increase in the safety of the work environment since the majority of the building operations are performed in the controlled environment of an off-site industrial facility. From the economic point of view, the prefabricated strategy can allow cost reduction not only for the construction, but also for maintenance actions (macro or micro operations) or hospital transformation during the time.

THE BUSINESS MODEL

The business model allows the modules to be brought to the construction site ready to be plugged-in, that means panels will be already present inside the substructure but some of them will not be jointed if some operations underneath or behind have to be performed. Therefore, the design approach permits a significant decrease in the construction times, which was required for the current necessity of an updated and cost-effective business in healthcare operations. The prefabricated modules and the building operations are performed in the controlled environment of an off-site industrial facility.

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