

POLITECNICO DI TORINO
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Honors theses

Open Source Emergency Shelter

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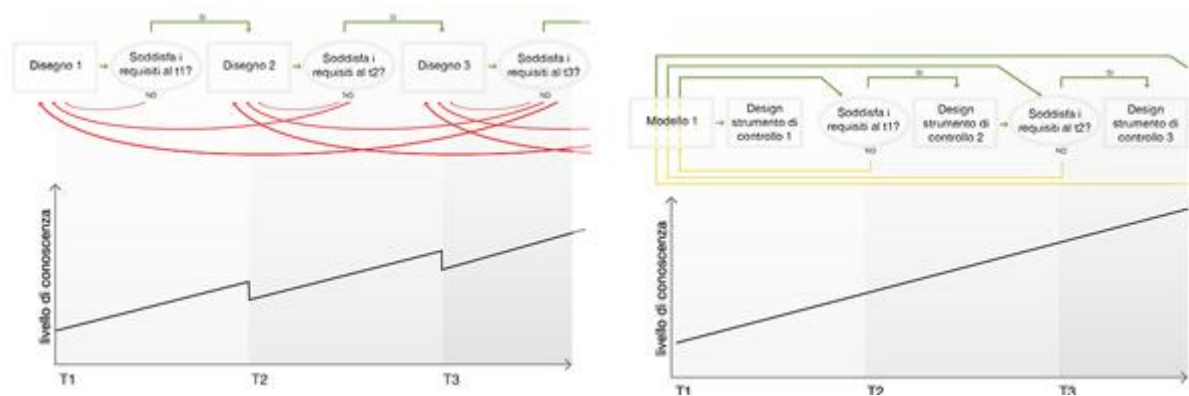
The emergency dynamic do not allow aprioristic knowledge of requirements: it is possible to design neither at preliminary stage nor at executive, a project that satisfies needs of all the world, according to all the documents edited by NGOs which are involved in the theme of emergency: the first resource during the recovery phase are survivors themselves, it is necessary to assess the needs of survivors as first operation after the emergency (since it is impossible to do it before), guidelines for emergency sheltering can be designed only on local scale. This happens because only at local level and post-emergency assets and needs undiscovers.

Since those two elements are the base of whatsoever design process, it is neither possible nor suitable a project that overlooks these, fostering an adaptive system in function of local climate parameters

Emergency sheltering stands necessarily in social innovation perspective, facing an highly social impactive theme, already pressing, with raising trends. Social innovation aims at enormous targets inside demand driven markets, or better at a sub-system of them, societal challenge driven markets, in with marginal utility is maximum and simply the existence of the intervention produces an enormous effect. It is therefor wrong facing the emergency shelter theme having in mind the paradigm typical of technology driven market.

New design tools and modeling design, defined as parametric, offers a general empowerment of design skills, but due to a series of misunderstanding and to their partially and yet partially experimental usage they are commonly related to a closed, unidirectional and deterministic design. In particular the idea of a series of input automatically corresponds to design outputs valid for a series of project is tempting, but it is not possible to forget that at the core of each single parametric and associative model stands a project, an idea, a concept, the Shape that generates the shapes, in the hands of the architect.

Base requirements for a concept are missing, thus it is impossible to proceed with a deterministic, closed, input-output system. In order to foster this path it will be necessary to pursue superficially approximations



Traditional design process vs. Associative design process

It is anyway possible to exploit associative model in another way, as a base description. Open, not finished, done in order to be modified, completed both in digital and analogic way. It is a description of the process because tools in its domain endures and can be exploited in other contexts, in other shapes, for non-forecasted purposes. What is fixed by the concept is the efficiency through which design becomes product, its functionality in terms of packaging, common to all the emergency sheltering, conciseness in raw material consumption, versatility in being suitable for different raw-materials, easiness in set-up. Rather than technical variables it cares more, on an higher level, to the one which determines the existence of the artifact, especially in context in which resources are almost absent. Before being smart, emergency shelter has to gain its right to exist, or we can say that only smart on an higher level design becomes reality.

The model has to be open in its definition (defined the unsuitability of a single design path valid for all the emergency context, it must be modified according to singular specific needs): in its production, in its capability of being analyzed on different scales.

The model designed takes advantage of model techniques of parametric modeling to shorten the passage from design to creation, comprehending the wider range of prototyping processes, integrating knowledges and labour available on site. It applies to different kind of analysis (curvature, to verify the feasibility of roof with flat panels, surface to volume ratio etc) and offers integration possibilities even under this perspective, such as FEM analysis of insulation levels.



Rapid prototyping of the bones according to different specific needs

Three case studies are simply explicative of how the design could evolve from the model. They are not real projects, because most of the hypothesis done to produce them are plausible but not necessarily true: they refers to near-future scenarios, but as written before, only after the emergency it is possible to know survivors' needs, that are here defined just to show potential of the model. Anyway they demonstrates the easiness in the step from virtual design to manufacturing, even concerning integration to the open source model.



From hi-tech to low-tech inside the same associative mode, different for local needs, materials available, manufacturing processes

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