The changes in human action, produced by technological progress, are also reflected in the construction sector, where new design and construction approaches have highlighted, over time, the many advantages offered by prefabrication.
Off-site construction, through a manufacturing process not strictly dependent on the site of construction of the building and through the use of prefabricated elements, allows to reduce time and costs, rationalizing the use of resources.
This approach has been widely used in buildings of collective interest, such as buildings for health, education, hotels, the tertiary sector and industry, it must, still, exceed the *habitus* that the private client typically has with regard to housing interventions, in which customization is preferred over standardization.

The customization of the project and its results in the implementation phase, carried out according to traditional practice, makes residential construction work expensive and prolonged over time with significant economic and environmental consequences.
Instead, standardization, while allowing an appreciable reduction in time and costs, limits, because of the simplification and reduction to the seriality of the components that make the architectural artifact, the satisfaction of the multiform exigency of the user, which is characterized by characteristic elements related to form, space, perception and psycho-physical well-being over time that are confronted with the variety of environmental and socio-environmental of interventions.

The introduction of digital assisted design and the use of numerical control production processes have allowed the consolidation of "contract" production, overcoming some morphological and performance limits of "catalogue" production, thanks to direct relationships between the project designer, interpreter of the client's/user's requests and the producer. There is a direct on-line relationship in which the design drawings, made with CAD, are transmitted to the manufacturer's technical office. They are analyzed, verified and corrected, without altering the characteristic features of the project, to be finally returned, in a short time, to meet the needs of the client with greater quality and flexibility.
However, in the prefabrication of wooden framed panels, among the unresolved problems, the production of waste emerges, generating avoidable costs to be borne by the manufacturer, which are transferred to the final cost of the work.

The aim of the thesis is to develop a design methodology for the construction of prefabricated buildings in wooden framed panels that, based on a modular coordination system, the use of digital technologies and numerical control manufacturing, is able to rationalize the design, the manufacturing process of the components and the construction, in order to reduce waste, costs and time.

The thesis, starting from the examination of the evolution and consolidation of prefabrication in the construction sector, proceeds with the analysis of some case studies related to accommodation, emergency, school and residential buildings, therefore deepens the theme of the use of wood as a building material in construction, with particular regard to the technology of wood-framed panel systems and, Finally, it proposes a design methodology highlighting advantages and disadvantages through the examination of some application cases.

The study leaves the debate open to further study and development that can improve the proposed methodology.

OBIETTIVO

Ottimizzazione del processo

di prefabbricazione

IL LEGNO

Impiego nelle costruzioni

Le pareti intelaiate

APPLICAZIONI

Casi studio reali

Ulteriori applicazioni

PREFABBRICAZIONE

Evoluzione nel tempo

La prefabbricazione oggi

PARAMETRI DIMENSIONALI

Componenti presenti in commercio

Pareti con dimensioni standard

CONCLUSIONI

Vantaggi / Svantaggi

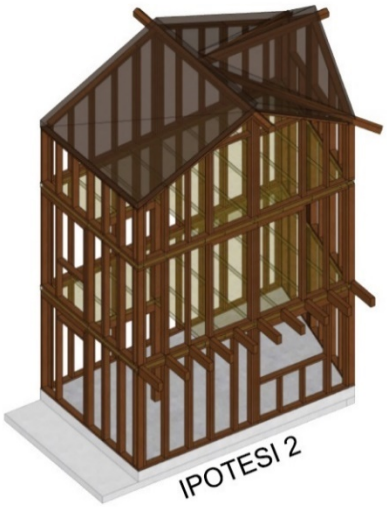
Sviluppi futuri

a = 0,625 m
c = 2,75 m

Particolarità

- Tre piani
- Tetto a falde
- Pianta non regolare
- Carichi distribuiti e concentrati
- Aperture di diverse dimensioni

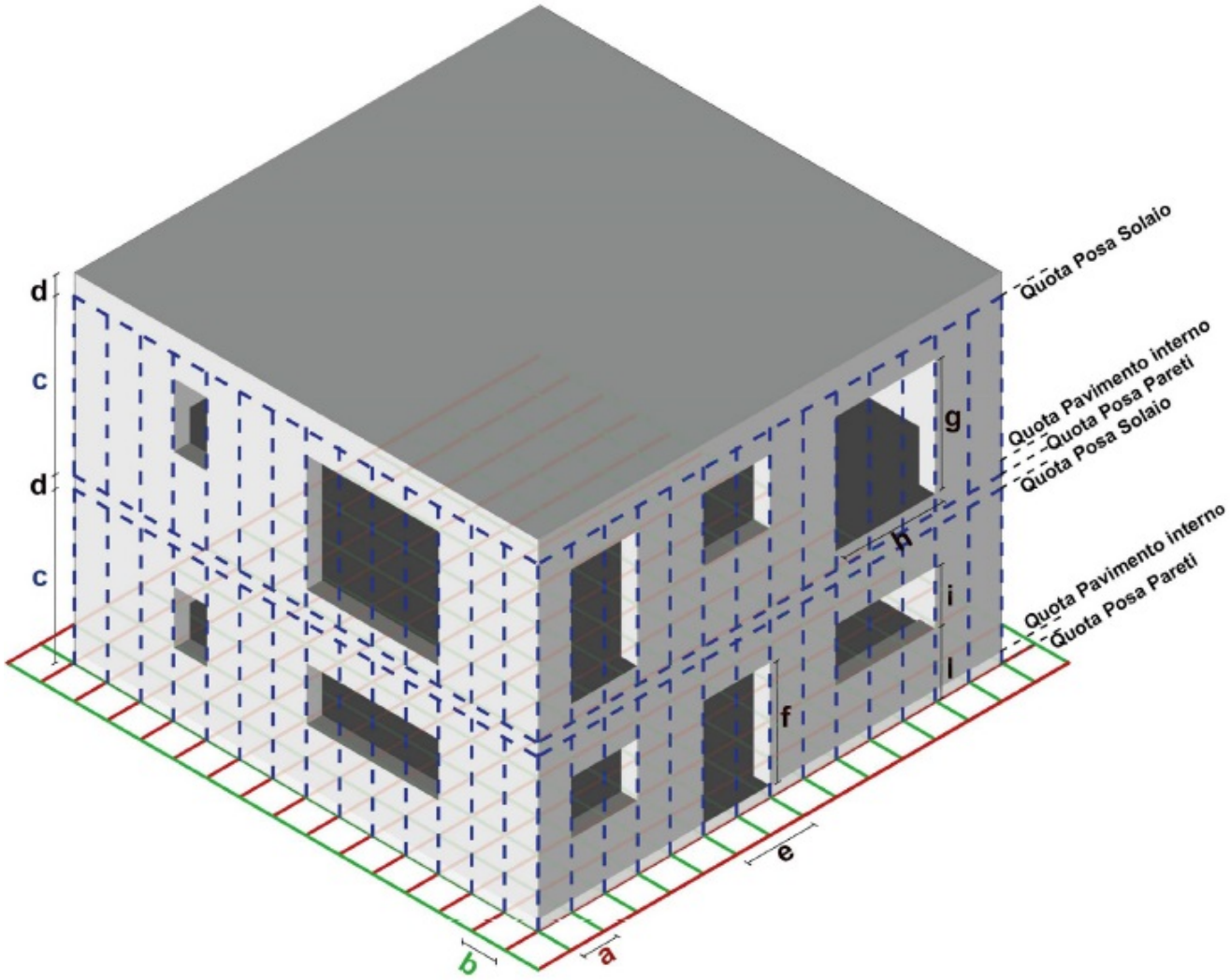
IPOTESI 1



IPOTESI 2

	Totale quantità di KVH impiegati (mc)	Totale superficie utile interna (mq)	Rapporto Quantità KVH/Superficie int.	Risparmio rispetto all'IPOTESI 1
IPOTESI 1	5,714	68,19	0,084	-
IPOTESI 2	5,371	68,55	0,078	6,49%

DEFINIZIONE PARAMETRI



- a = b = modulo dimensionale scelto
- c = l'altezza delle pareti (pannelli)
- d = altezza solaio strutturale
- e, g = luce netta tra i montanti
- f, g, i = indipendenti