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**HOUSING FOR TRAVELLING: DESIGN
ARCHITECTURE AND TERRITORY
USING VR STUDIO - BIM - IFC**



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The focus

How to design a complex project, to show it and to attract different people to become member of this same project. The problem is that, in this situation, different important factors are mixing together.

The idea of the housing for travelling

The conception and realization of a housing space no static but able to be moved, or that can be move autonomously, it becomes a privileged opportunity in order to have an interaction of complex studies, focussed to “the project of the modularity” (or to “the modularity of the project”); to the evolution of the housing space during the time; to the architecture of the main space; to the relationship between used resources and overall costs.

The meaning (technical and cultural) of the travel

The results of a scientific research

The need to compare the environmental sustainability of the Recreational Vehicle solution with the more widespread “car + hotel” format, with relation to the amount of CO₂ produced in the two means of travel/accommodation.

Comparing the two modes of tourism – the combination of automobile + hotel, and the Recreational Vehicle – a reduction of up to 65% in CO₂ emissions was recorded in favour of the RV. By way of example, data was gathered on CO₂ emissions produced during a trip of 1000 km undertaken by a group of 4 persons in 8 days, which turned out to be 32% lower than the level of emissions achievable with the automobile + hotel mode of travel.

Extending the duration of the trip to 15 days, this percentage reduction improves to 56%; moreover, increasing the size of the party to 6 persons, the reduction in emissions will improve still further to 69%.

There are economic benefits for the area visited: average expenditure for a party of 4 persons (covering food and other items) amounts to around 80 euro, which can be added to the economic advantages of lower pollution.

The added value of the sustainability

Living on the move reducing CO2 emissions

For the end user, accordingly, the choice of an itinerant lodging – whatever the attraction, be it mere utility or preferred lifestyle – can be prompted by the clear realization that, in these times, sustainability must be pursued as nothing less than a social value.

The living enclosure of the Camper is already able to achieve what for any other accommodation structure remains a Utopia scenario: in normal use, CO2 *emissions* register practically at a level of *zero*.

Indeed the living enclosure is effectively self-sufficient from the energy standpoint, and non-polluting.

the new opportunity for the territories
the uploading of the local tourism
the focus to connect people and environment

This research has also been conceived and developed to document the possibility of creating unprecedented, scientifically-based synergies between operators in the territory and local Bodies, with the aim of identifying and developing new ways of enhancing the local economy, even in places less involved in traditional tourism which are nevertheless rich in history, culture and handicrafts, all waiting to be exploited to the reciprocal advantage of all concerned.

The benefit for the big industries involved

This text also contributes to spreading the word, among nonemployees, about the leading Italian company in Europe for the production of Recreational Vehicles: 80% of those currently travelling throughout Europe are in fact composed of Fiat Ducati engines and chassis, produced by Fiat Veicoli Commerciali.

The need to start a network between different actors

A network between 22 members including Municipalities, Industry, Association, Farm is born in order to promote and to realize the opportunities described in that research. Is the first experimentation in Italy of this type of network.

The possibility to save time and cost designing infrastructure (roads and architecture)

The importance to an holistic approach to design

The Industry Foundation Classes (IFC) data model is intended to describe building and construction industry data. It is a platform neutral, open file format specification that is not controlled by a single vendor or group of vendors. It is an object-based file format with a data model developed by building SMART (formerly the International Alliance for Interoperability, IAI) to facilitate interoperability in the architecture, engineering and construction (AEC) industry, and is a commonly used collaboration format in Building information modelling (BIM) based projects. The IFC model specification is open and available. It is registered by ISO and is an official International Standard ISO 16739:2013. Some government has made the use of IFC format (s) compulsory for publicly aided building projects. (Danish Finnish Norwegian England USA require use of IFC BIM in all projects as well as many municipalities, private clients, fabricators and designers have integrated IFC BIM in their business

How to realize this project. It was a challenge

According with my ongoing idea of scientific research the design and the research in the design field could receive benefit opening to the concept of “story telling”.

The digital resource allow to simulate a travel of the project that born as an idea and becomes a design at the and of the way.

In my research view what happens along the way is as important as the arrival point: explain a research idea is like describing a story.

There are actors, businessmen, public, curious, people passing, people who work behind the scenes...

To obtain this result it is so important to decide how realize the scenario and above all how to put inside it the different parts of the history.

From a technical side this means to have a main software able to connect different standards and results from other digital resource. Please note that the connection between technical software (for Architecture or Engineering) is worldwide the biggest problem at the moment, above all in the technical design no just in the visualization field.

The 3D model made with UcWin/VrStudio was chosen as this main software. And was interconnected with others software: 3D Studio; Rhinoceros; MeshLab; Movavi; Glc_Player, and the most important BIM software Allplan; Archicad; Revit.

The virtual scenario is both technical and “experiential”

In the same virtual environment are mixed together different focuses:

- the history of the research
 - the suggestion of the culture of the territory
 - the most advanced format in order to exchange data with BIM-IFC standard
- (I am a researcher in BIM design field from 1997)

There are made some output using the 3D model that were presented in some important events and locations national and international:

- the official Video Presentation of the Network
- the Motorhome Exhibition in Parma
- the Italian/English Book “Mobile Lodging Unit: First experimental research in Italy on the sustainability of the Recreational Vehicles”
- the International Conference Press of Fiat Chrysler Automobiles Stresa 2015
- the Milano Fuori Expo Tuscany Pavillion
- the Fiat Camper web site (in publishing)

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