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EXPERIENTIAL TOURISM

Research, experimentation and innovation

Paolo Carli, Roberto Giordano, Elena Montacchini, Silvia Tedesco

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ABSTRACT

The aim of the experience developed within Alta Scuola Politecnica, in collaboration with the world of industry, was to simultaneously implement research and teaching, through experimentation and prototyping to identify new solutions and answers to the real problems of tourism and its most recent evolution into ‘experiential tourism’. A description of the experience and an assessment of the results achieved (in terms of research, production and academic education – highlighting the potential of a multiscale approach to the management of complexity – is part of the debate on the role of Universities in training and research and on synergies with industry, seeking to provide answers to the following questions: How can the quality of higher education and research activities in Universities be guaranteed, while working towards their practical application? How can we promote the ability to make the most of the meeting between supply and demand for innovative knowledge and technologies?

KEYWORDS

systemic approach, innovativation, research, experimentation and prototyping, experiential tourism

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Tourism has always stood in opposition to the productive model of society. Despite having always existed to some extent, in the twentieth century and this initial phase of the new millennium, we have witnessed its rebirth in the modern sense, its transformation from being an elitist phenomenon to something available to the masses, its commercial development, and its further diversification. More importantly, we have also witnessed the transformation of ‘travellers’ into ‘tourists’ (d’Eramo, 2019). The trajectory of the transformation of travel into tourism runs parallel to that of the economic and productive development of Western society. In other words, it has led to an almost compulsive increase in tourism opportunities, to the detriment of environmental resources, and often the quality of tourist products (poor-quality package holidays for example). As time has gone by, however, tourism has diversified its production, allowing a wide range of choices of destinations, accommodation, activities, and above all quality.

Tourism also has numerous ties with both territorial and architectural design, in a transversal and trans-scalar way, making it a subject with extensive scope for research: from the design of long-distance infrastructures to territorial development plans, from the design of hospitality and service facilities to the design of the services to be provided. This last aspect, relating to the integration between the hospitality facilities and the experiences offered to the traveller-tourist, has been the subject of further investigation by Let’Set: a challenge-driven practical teaching activity and research-action (Cognetti, 2016), offered by Alta Scuola Politecnica (ASP), with the cross-disciplinary participation of researchers, teachers and selected students from Politecnico di Torino and Politecnico di Milano, and the active involvement of professionals and the world of industry.

Experiential tourism: new temporary living models | Mass tourism is by no means approaching its end, yet the habits of tourists have changed, especially when it comes to the amount of time and money they can spend (Albanian, 2013). As the time that people can devote to holidays has decreased, their spending power had grown, steering tourism initially towards exotic destinations and then, when these became exhausted, partly due to the international geopolitical situation, towards tourism which is more aware of both the environment and local cultures. This trend was highlighted by a TripAdvisor survey carried out in 2014 (Booking Blog, 2020) and aimed at its users. According to the data collected, 71% of those interviewed travel ‘to broaden their horizons’, 36% ‘to soak up the local culture’ and 55% ‘to have a unique and interesting experience’. Similarly, it is worth mentioning a study published by the Journal of Consumer Psychology which explains how the experience of travel makes people happier and more satisfied than the purchase of material goods (Gilovich, Kumar and Jampol, 2015). This opinion is shared by Brian Chesky, CEO of AirBnB, the online portal that connects supply and demand for short-term accommodation, who says that the vast majority of new generation tourists (Millennials) prefer to spend money on an experience than on material goods (Kutschera, 2019).

Talking about AirBnB, the sharing economy has contributed massively to the rapid transformation of tourism in recent years. The possibility for people with ‘extra space’

to enter the global accommodation market has transformed the very meaning of tourist accommodation, taking it outside traditional hospitality structures, which are separate and clearly identified within the building heritage, and into the heart of the various territories, into people's homes and right into the depths of different cultures. The combination of the elements highlighted is that there is now a segment of tourism that responds to the name of 'experiential tourism', a form of tourism characterized by four main factors, which allow a taxonomy unencumbered by the issues related to the geographical destination. According to Moreschi (2017), these are: 1) short duration of stay, 2) fullness of the experience, 3) close interaction with tradition and local ways of life, whatever they may be, 4) attention to the conservation of the territory and the environment.

From the point of view of the new 'living models' linked to accommodation and hospitality, experiential tourism represents a unique opportunity for design and innovation, for professionals and companies involved in this sector, because it allows the imagination of temporary and flexible scattered solutions with a low environmental impact, solutions that can be adapted as and when necessary to suit the requirements of incoming travellers-tourists. It also allows the same flexibility in terms of the business models and activities that can be pursued, allowing entrepreneurs, especially young people, to enter the market with less capital than is needed in traditional tourism services related to the hotel model.

Let'Set: a challenge-driven project | The context described above is the perfect container for Let'Set – Choose, Build, Experience – a project with a title that encompasses the intention to propose the organization of a tourism model that responds to the challenges of: 1) identifying key areas for innovation; 2) formulating activities interconnecting teaching and research; 3) defining a new community of users; 4) designing spaces and managing a program of tourism; 5) process and product innovation. Four points related to a challenge-driven approach which consist of a set of processes, business rules, workflows, tools and principles that provide a framework and methodology for innovation based on diversity, to identify problem areas and targeted opportunities and to develop solutions (Bellini et alii, 2018). An approach that is unusual in architectural design alone, but extremely contemporary when the design of an inhabited space is strongly interconnected with other factors, such as the design of the tourism service, the identification of a proposal characterized by value (what kind of service is offered and what makes it unique) and the management of visitor flows. Starting with the assumption that tourism is the most important industry of the century, both the last one and this (d'Eramo, 2019), and that it is also a sector in perpetual evolution (Gemini, 2008), the Let'Set team decided to investigate the transformation of tourists in recent years and, above all, of their requirements and willingness, particularly with regard to accommodation.

Goals and key areas of innovation | The theme of experiential tourism has been an opportunity for research, experimentation and innovation to identify new solutions and new responses to market demands. The general aim of the project consisted in the de-

velopment of a new service for experiential tourism, involving the design and construction of spaces for temporary accommodation characterized by technologies that can be easily assembled, disassembled and transported, made with easily interchangeable materials and components, in order to ensure the most effective adaptation to different geographical and climatic contexts (seaside, mountains, cities). Thanks to its flexibility and adaptability, the technology, or rather the technological dimension of the project, offers ‘tourists’ tailor-made hospitality services consistent with their need to enjoy unique experiences in the place they are visiting.

The challenge was launched, together with the ASP research group, by the project’s partner company, LAM Ambiente Srl (Arezzo). A company active in the field of dry-assembled buildings for residential use, intending to expand its reference market. This led to a specific goal, which defines the area of innovation addressed by Let’Set: the design of small modular units that can be adapted and integrated according to a receptive model based on the scattered hotel. Living spaces that are not ready-made, to which the user adapts, but spaces that are created virtually, associating a framework of requirements with possible solutions, and then built in one of the places destined to the tourism experience. In order to fulfil the aims described, the Let’Set’s team involved a wide range of professionals who work in the tourist hospitality sector: architects Paolo Scoglio and Alessandro Trevisan, hospitality companies such as Eco Bio Agriturismo La Bella Vite – Camere Con Vigna in Carpeneto (Fig. 1), and of course LAM Ambiente, which has consolidated experience in the residential and tourism construction sector.



Fig. 1 | Eco Bio Agriturismo La Bella Vite – Camere Con Vigna in Carpeneto – The Ne[s]t Living Studio (credit: Let’Set, 2019).

Definition of the reference contexts | The identification of different landscape and climate contexts (seaside, mountain, city), was based on a characterization of current tourism trends in Italy. Seaside tourism in Italy is a growing sector: research carried out by the CNA Balneatori Association (2017), among the 457 owners of bathing establishments in 59 Italian coastal areas, shows that between June, July and August of that year there were about 90 million visitors, +16% from the 75.6 million of 2016. Recent research carried out by the Mountain Tourism Observatory of the Valle d'Aosta on data provided by the Valle d'Aosta Regional Tourism Department, relating to presences and arrivals in 2018, shows that 'desire to spend time in the mountains' has also grown: recording 20% more arrivals and 11% more presences than just 10 years ago (Valle d'Aosta Tourism Observatory, 2018). Lastly, the growth trend for presences or interest in staying in certain places also concerns tourism in the small and characteristic Italian towns.

The following were carried out for each context: an analysis of the main climatic variables, referring to the typical climatic conditions of the Mediterranean, Alpine, and continental environments; a hypothetical orographic characterization of the soils; a survey of the prevailing type of vegetation. A geographical and climatic reference environment was also identified, in which to subsequently define specific places, in order to analyze the most appropriate design parameters for the application of a receptive model based on the 'scattered hotel'.

The identikit of a new user community | To create an identikit of the users, reference was made to the demand-performance approach, starting with the definition of the characteristics and activities sought by 'new tourists' in accommodation facilities, identifying their needs within a planning framework for tourism based on specific guidelines. A careful study of the literature available and a series of direct surveys, through questionnaires, made it possible to analyse experiential tourism trends in terms of supply and demand and to establish the characteristics of the user (or users) of reference. Data gleaned from literature data revealed the following trends.

Beach tourists are mainly represented by families or groups of friends (L'Osservatorio Findomestic, 2019) two categories which clearly have different expectations, but which are, nevertheless, united by the search for high-quality spaces and recreational activities; the average stay is 7 days. Mountain tourists, on the other hand, have been represented in recent years by families with children (53.1%), who mostly seek environments capable of decisively opposing their chaotic and stressful workplaces. Families are looking for environments that can express a concept related to well-being, the environment and personal care, from body treatments to nutrition. The average stay is estimated to be around 5.2 days (Osservatorio Turistico Valle d'Aosta, 2018). Lastly, tourists looking for experiences in cities are extremely heterogeneous (students, families, couples, singles, the elderly, etc.); the average stay is 5.5 days, ranging between 4 and 7, depending on the type of city (big, medium or small) and the type of services it offers (the city with artistic vocation, the city with industrial vocation, the city with a vocation

for services). In small Italian towns, it is increasingly common for people and families to stay for even just for one night (Baldazzi, 2014).

Parallel to the indirect analysis of the data found in literature, direct analyses were carried out using a questionnaire. The direct analysis aimed to reconstruct the framework of the activities and behavioural patterns of tourists by identifying their habits and outlining the type of experience they expect from their trip, based on their specific destination (seaside, mountain, city), in order to contribute to the complete definition of the framework of demand. Google Forms, a tool that enables the performance of online surveys, was used to carry out the questionnaire. The social networks and WhatsApp were used to promote the survey, conducted in Italian and English, making it possible to reach all the contacts available to the team. The survey consists of eleven questions aimed at investigating the age of the respondent, the number and type of travelling companions (friends, relatives, children, colleagues, etc.), preferred/usual destinations, length of stay, the purpose of the trip (culture, leisure, business, etc.). The respondent is also asked to assess, on a scale of 1 to 5, the importance of contact with nature during the stay and to select three essential services, from a list of options, that an accommodation facility should have. The questionnaire received 220 responses and the majority of respondents are between the ages of 35 and 45. In general, the results are in line with the conclusions drawn from the analysis of literature (Fig. 2).

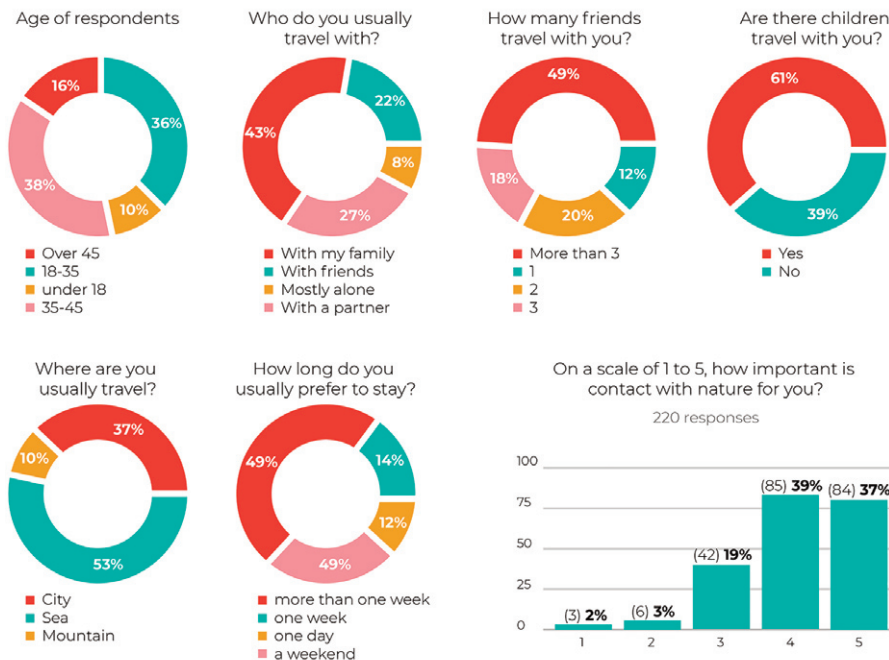


Fig. 2 | Results of the questionnaire on tourist behavioural models (credit: Let'Set, 2019).

Three friends

composed by: Jennifer, 25 y/o; Chris, 27 y/o; Thomas, 26 y/o



They are a group of 3 friends who enjoy mountain and sports. They decided to have a week-end off and get the best they can from what the location offers in terms of entertainment.

NEEDS

1. Have fun
2. Do sports
3. Relax after skiing

REQUIREMENTS

1. Space in the unit where to host other friends and stay together
2. Space to store all the necessary equipment
3. Places to rest

POSSIBLE SOLUTIONS

1. Provide a central space in the unite around the tree; provide a *common module* with a bar or a pub to allow customers to drink together while warming up.
2. Obtain a small space inside the module where the equipment can be easily laid; offer an equipment rental service.
3. Provide a hot tube with tree view; provide large bedrooms with view on the mountains.

Fig. 3 | Example of a community of users who intend to take a few days' holidays. The figure is divided into three sections: Needs, which identifies the necessities in brief; Requirements, which establishes the living space requirements; Solutions, which defines the project guidelines (credit: Let'Set, 2019).

Families represent the main category of tourists, tending to consist of mother and father and 1-2 children. Friends also travel in small groups, usually in 3-4 or more people. Another confirmed figure regards the average stay, which was about one week, or a little less, while the percentage of those who decide to spend more than one week on holiday is 49% of the total. Depending on the type of experience that new tourists expect from their trip, it emerged that contact with nature is an essential value, together with the desire to relax in a peaceful environment. The data emerging from the indirect and direct analyses have been summarised in a series of identikits of tourists – i.e. the user community – to which the project guidelines are associated (Fig. 3).

Case study analysis | In order to further characterize the user community, a phase of the Let'Set project focused on the collection of case studies compliant with the environmental and climate contexts defined. In line with the general aims of the project, the case studies were selected based on geographical, climatic, morphological, distributive and constructive criteria responding as closely as possible to the needs of the new user community. For experiential tourism by the sea, for example, the two main demands that emerged from the surveys and the main features of the collected case studies are a sea view and the articulate use of outdoor spaces. From this point of view, the Hut On Sleds project by Crosson Clarke Carnachan Architects in New Zealand in 2007, where the wooden shading system of the main façade creates a roof over the space in front of

the living module when it is open, enhancing the view allowed by the double-height interior space (Frearson, 2012), was emblematic. As was the experimental Koleliba mini house (measuring just 2.4 meters long) created by Hristina Hristova in 2005, with the addition, alongside the project's aim to create a natural visual and material connection between interior and exterior, of the theme of transportability (Tebbutt, 2015).

As regards the mountains, the focus was on attachment to the ground, as these minimum living modules are often similar to shelters and are built in inaccessible places. These structures have to be designed to withstand avalanches and landslides, as well as the change in stability and compactness of the soil due to climatic fluctuations between winter and summer. Most importantly of all, they have to be able to tackle the problems of transport to and assembly at high altitudes. Based on these points of view, the case study of the New Gervasutti Shelter is emblematic: the module, designed by Luca Gentilcore and Stefano Testa, is part of the LEAP (Living Ecological Alpine Pod) project and was built in 2011 above Courmayeur (AO) at an altitude of 2,835 meters above sea level. It is a cantilevered tube measuring 8.00 x 3.40 x 2.40 m, for a total of 30 square meters, which was entirely prefabricated, transported (when it was practically finished) and installed with the help of a helicopter (Frearson, 2011).

Another project which is important for research purposes is the Alpine Shelter in Skuta, designed by the architects OFIS and AKT II, with the support of a team of students working within a teaching module of the Harvard Graduate School of Design, in 2014 in Slovenia. In this case, the attachment to the ground adapts to different slopes in the project area, as the module was divided into three parts to simplify transport and subsequent assembly, respect the variation of the slopes and separate the interior functions.

The case of urban experiential tourism, on the other hand, differs from the previous two, as the dimension of 'slow tourism', which often coincides completely with experiential tourism, is partially missing here. Of course, urban experiential tourism is always about participating in different ways of life, but this is why it also encompasses the concept of business travel and short breaks. In this context, the most relevant characteristics found in the case studies investigated are those of architectural parasitism and scattered hospitality. The Loft Cube designed by the Berlin-based studio Aisslinger in 2016 is one of the most successful experiments in this field. Located on top of the Hotel Daniel in Graz, it is completely prefabricated, with a structure so light that it can be positioned on the roof, in strategic points to offer a view of the city.

Although designed for stable forms of housing, the 3BOX project by Stéphane Malka Architecture, created in 2016, is also a very interesting case study to explore the theme of hospitality in cities, starting with the role that roofs can play in terms of minimizing ground consumption and technological integration (Paragoy, 2016). In this case, too, the modules are built off-site, then transported and put into operation quickly, thanks in part to the technical consultancy work of the experts from Les Toits du Monde.

Workshop for the design and construction of the modules and management of

tourism | In the logic of combining theory and practice, academic education and research, and in line with goal 4 of the Challenge-Driven approach – Designing an Appropriate Tourism Offer, the team physically tried to ‘inhabit’ four small buildings in the middle of a vineyard at Eco Bio Agriturismo La Bella Vite in Carpeneto (Alessandria, Piedmont), in close contact with nature. The modules, created by The Ne[s]t Living Studio, are the result of the partnership between the architectural studio and the owner of the winery, who also owns the land on which they stand. The small houses allow travellers to spend a night in the vineyard and the experience offered during their stay includes trying their hand at winemaking, a visit to the winery and the grape harvesting itineraries, as well as the chance to taste the estate’s wines and local products.

The countryside and vineyards, elements that characterize the territory, enter the holiday homes, distinguished by solutions that enhance the panoramic views and incorporate the vegetation into the design: an outdoor terrace, shared by different modules, becomes a unifying element, a space in which to relax and contemplate the landscape; a glass façade frames the vineyard directly from the bedroom; a tree becomes an essential part of the housing module, by which it is incorporated and enveloped.

Metadesign | The Carpeneto experience provided an opportunity to create the first Let’Set workshop aimed at studying the morphological-dimensional aspects of the buildings, along with the interior layout and the arrangement of the modules in relation to one another. The workshop also analysed the technological characteristics of the envelope elements and the technological systems, in relation to the microclimatic conditions of the site (Fig. 4, 5) in order to develop a concept for the design of the living spaces and the tourism service.

Thanks to these activities and the direct interaction with the designer – architect Paolo Scoglio – and the owner, important foundations were laid for the subsequent design, which incorporated and implemented the project guidelines. A strategic aspect that influenced the subsequent phases concerned the development of a module concept based on the principle of flexibility (to guarantee maximum adaptability to user requirements), modularity (to favour the standard production of elements that can be added to or removed from the module, depending on specific site conditions) and lightness (to guarantee transportability even in inaccessible places and onto roofs of existing buildings). Some issues related to the management of the prefabrication of the modules – particularly in relation to transport and the verification of certain technological details such as the connection between the closing elements and the surface foundation – and others related to the development of the hospitality service and relative business were of particular importance.

The design-construction and management project | For further investigation of certain issues, related to critical aspects that emerged during the immersive experience in Carpeneto, and related to the construction, assembly and transport of modular residential

modules for experiential tourism, the team had the opportunity to organize and participate in a workshop in which the main technical elements of the housing modules were designed and built at LAM Ambiente's headquarters (Fig. 6). The organizational details of the workshop were related to research and action methods and tools, favouring the community generation of knowledge and skills related to the feasibility of the design proposals. The design of a technical element, like the methods used in the design of the systems that connect elements and materials, was immediately verified thanks to construction actions – or to be more precise, attempts at construction – by the group of ASP students, teachers and experts. The continuity between the definition of possible design solutions and construction feasibility allowed the constant assessment of and reflection

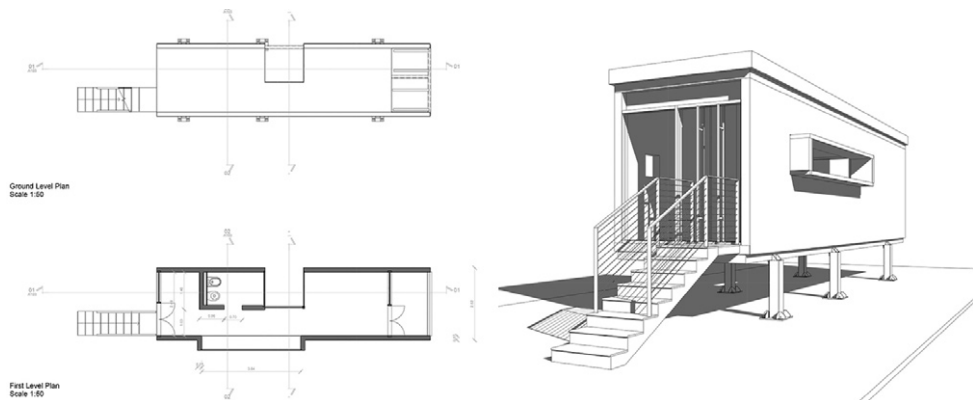


Fig. 4, 5 | Survey and redesign of the modules designed for Carpeneto by The Ne[s]t Living Studio; A working moment during the Let'Set meta-design workshop (credits: Let'Set, 2019).



Fig. 6 | The Let'Set design-construction workshop at the headquarters of LAM Ambien (credit: Let'Set, 2019).

on the strengths and weaknesses of the temporary housing module, encouraging the immediate and continuous identification of possible solutions.

The conditions of modularity, flexibility and lightness led the research team to prioritise a wooden frame system, consisting of uprights and transoms, 2.80 x 1.00 m tall. The depth is, of course, variable in relation to the climatic context without, however, changing the frame elements. The modular system has been conceived to define both the vertical closing elements and partitions and, thanks to certain adaptations, also the roofing system. The predominant type of material (wood or wood-based components) was suggested by the industrial partner involved in the project, which has specific know-how in the design and construction of wooden buildings. LAM also made the necessary spaces, tools, supervision of manpower and materials available to the team in order to test: 1) the different stratigraphy of the modules for the different seaside, mountain and city contexts; 2) the most efficient design possibilities related to the connection between the modules. In order to supply a further technical-scientific contribution to the Let'Set team, architect Alessandro Trevisan, designer of ARCA (ARchitettura Comfort Ambiente, a certification system specifically for wooden constructions), was invited to participate. The setting up of teams with interdisciplinary skills made it possible to define not only the characteristics of the technical elements but also of the services (heating, electrical wiring and hot water), as well as the relative methods of technological integration.

As already mentioned, the aim of the workshop was the design and almost contextual construction of four mock-ups (scale 1:1): that of the junction between the modules and

those related to the stratigraphies of the external walls of the types of modules to be used in the three environmental contexts of reference. The workshop, which lasted three days, proved to be strategic in exposing design errors and weaknesses and in rapidly identifying improvement and corrective actions. For example, the dovetailed wooden joint, without carpentry supports, designed by the team, which seemed to work in theory, turned out to be structurally inefficient and complicated to use for the installation of the modules during the workshop.

The practice and the direct experience of construction proved that it was impossible to use the dovetail joint in a wood alone due to the anisotropic and hygrometric characteristics of the material. In order to facilitate the assembly and disassembly of the residential modules, the team opted for a dovetailed steel interlock, made in the workshop. This type of joint accelerates the positioning of the modules by facilitating their connection, also ensuring almost perfect adhesion between the modules and, therefore, the possibility to cover up the connection gap directly on-site using conventional technologies (plaster or other finishes). The design of the external walls of the three different types of modules (seaside, mountain, city) proved to be more correct, both from a structural and thermo-hygrometric point of view while highlighting all the difficulties of the transition from design to construction.

The Let'Set workshop in Arezzo was a central experience of the project, not only in terms of the technological-constructive aspects but also because it allowed a real comparison with the entrepreneurial aspects of construction, management and deconstruction (taking into account the temporary nature of the housing module). The organisation of a meeting focused on the management aspects of the accommodation service, with particular reference to the phases of off-site production and production in place with LAM CEO Andrea Ceparano, was an opportunity to investigate and resolve some key issues related to the research project. Starting with the procurement of materials and components, moving on to the procedures related to processing times and costs, and then defining the methods used to store and preserve the technical elements produced.

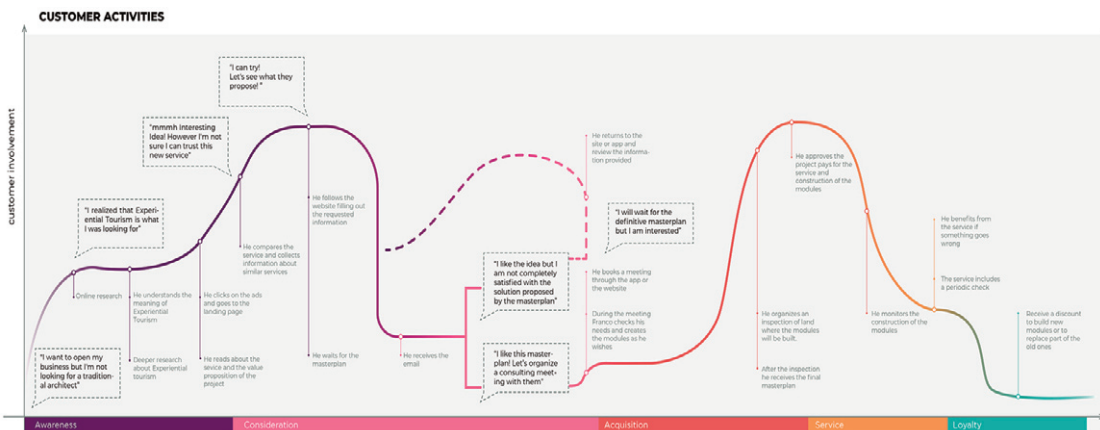
The Let'Set configurator: an innovation of process and product | The results achieved in the Let'Set workshops, and during the analysis that preceded them, formed the basis on which the last phase of the project was set up, oriented at developing its innovative content. This phase led to the design and development of a configurator capable of relating the variables that characterize the project and the construction/deconstruction of the module together with the planning and implementation of the tourism offer. It also involves the development of a tailor-made product and process service for experiential tourism. The configurator was conceived as a virtual professional service application offered by LAM Ambiente to its customers (design studios or other direct investors acting as intermediaries with tourists), which allows the user community to visualise the planovolumetric project of the module through an 'online planner', on the basis of general initial indications provided by users (relating to the context), with the

gradual provision of more detailed options. At the same time, the company displays the technical elements from its premises, along with its component materials (Fig. 7).

The configurator is not limited to the mere definition of the morphological and distributive characteristics of the module and the selection of the technical and technological elements but provides a management section capable of almost synergistically linking the user and the designer, the designer and the companies, the companies and the managers of the spaces destined for tourism. There is a series of functions that make it more advanced than other ‘online planners’. The Let’Set configurator offers numerous functionalities in a single application: it reduces the delivery time of the customised module to a few weeks, thanks to an effective interface between all the players that are involved in the design, production and organisation of the service.

Three families of residential modules designed for three different climatic and landscape contexts were developed. The research team decided to associate each module with the name of tree species that characterise mountain, seaside and urban environments. The mountain module is called House Tree Abies because the fir is the tree that best represents the Italian and European Alps; at the opposite extreme we have the Maritime Pine, which represents all the Italian and southern European coasts, hence the name House Tree Pinus Pinaster. Lastly, the Chestnut tree, the urban tree, with characteristics of tremendous durability and longevity, representing a very powerful urban landmark, defines the city module, which is called House Tree Castaneis.

More specifically, the House Tree Abies, being designed for a climatic and environmental context that consumes a lot of energy in winter and requires active heat production systems, posed numerous problems related to the aspects of indoor thermohygro-metric comfort and energy self-sufficiency. Its inclusion in the context also plays



a decisive role, focusing on the connections with the ground of House Tree Abies, in a continuous interaction between slopes and exposure, the shadows cast around it, winter and summer solar paths, landscape inclusion and accessibility. The configurator of the House Tree Abies module proposes an internal distribution in relation to typical tourist activities (trekking, skiing, hiking, rafting, etc.) based on the project guidelines while allowing users a certain amount of flexibility in defining specific requirements.

In the House Tree Pinus Pinaster (Fig. 8) the theme shifts from energy for the supply of active heating systems to passive cooling and ventilation systems. The House Tree Pinus Pinaster is lighter and more adaptable, it requires fewer technological systems, especially when it comes to air conditioning because it works with the sea breeze and night/day thermal inversion. Also, in terms of its distribution layout and function, the House Tree Pinus Pinaster allows the user greater freedom. It can be a free plan 'cabanon' or a compartmentalised dwelling; it can be a service structure for bathers on the seafront or a portion of a scattered hotel. The House Tree Pinus Pinaster works around a more extended holiday time dimension than House Tree Abies, losing its connotation as a warm, protective and compact nest in favour of a more open view and adaptability of spaces, in line with a carefree lifestyle, typical of a beach holiday, of acceptance, hospitality and conviviality.

Thanks to the modularity and lightness of the system of uprights and transoms, the House Tree Castaneis can be installed in the city in a multitude of situations, ranging from ground support to placement on the roof of existing buildings and installation in disused industrial structures. The House Tree Castaneis aims to promptly respond to specific urban problems related to accommodation, however temporary. The strength of this interpretation is that it is a tool to solve specific urban problems, from housing

Previous Page

Fig. 7 | Representation of the flowchart of the Let'Set configurator (credit: Let'Set, 2019).

Fig. 8 | View of the House Tree Pinus Pinaster modules installed on a beach (credit: Let'Set, 2019).



for people in difficulty (from migrants to the poverty-stricken) to the clustering of several modules to accommodate students and employees working away from home, on a temporary or permanent basis. In terms of performance, the House Tree Castaneis is midway between the House Tree Abies and House Tree Pinus Pinaster, having to guarantee indoor thermo-hygrometric comfort in both winter and summer according to a logic that is not necessarily off-grid but can be combined with urban networks, as well as rapid assembly and disassembly, and a variety of possible and defined solutions for its urban integration.

Conclusions | By means of a description of the experience of the Alta Scuola Politecnica and an assessment of the results achieved (in research, the world of production and teaching) – highlighting the potential of a multi-scale approach (Perriccioli et alii, 2018) as a tool for managing complexity – the contribution is part of the debate on the role of the University in training and research and on synergies with industry: How can the quality of higher education and research activities in Universities be guaranteed while working towards their practical application? How can we promote the ability to make the most of the meeting between supply and demand for innovative knowledge and technologies? (Torricelli, 2014).

The challenge-driven approach – albeit with the necessary adaptations to the specific context in which the work was carried out – made it possible to conduct a unique experience, generating interactions between operators in different sectors related to the design of tourism and unusual relationships between cultural and professional areas, starting from an educational project capable of interacting with research themes, and research themes that have developed in weak settings straddling the production of manufactured goods and the production of services. A body of cross-disciplinary research and actions, which have allowed not only students but the entire Let'Set team to co-generate new skills and knowledge and exploit them in an end 'product' that is hard to define. Both a building and an industrialised and complex technological system made up of modular and composable technical elements. And, also, a tool that tends to reduce the design, production and construction times of the modules to zero, as well as a service capable of satisfying the experiential tourism needs of a community of users in a unique way. More generally, it is an opportunity to develop the meeting between supply and demand for innovative knowledge and technologies (tangible and intangible).

In the challenge-driven logic, Let'Set faced several challenges, some defined with methodological rigour in the start-up phase, others unplanned and unprogrammable, encountered phase by phase, always with the ability to draw on diversified knowledge to solve problems efficiently. The timing imposed by the Let'Set project (about 24 months) did not allow the launch of a process of prolonged monitoring of the effectiveness of the responses to the challenges. However, these are activities that, thanks to new hybrid forms, which will once again include teaching, research and design, find a time and a way to be developed in the near future.

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