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Paper Design. **Un progetto di ricerca di Lab MD**
Nei processi competitivi d'impresa la ricerca d'innovazione può essere perseguita attraverso strategie e modi operativi molto diversi fra loro. Può puntare a miglioramenti parziali conseguenti all'analisi dei bisogni (mediante l'User-Centered Design), all'apporto del design inteso come progetto formale (styling), oppure tentare di procedere a "salti" investendo sulle tecnologie; ma, anche, può derivare da una visione di design-driven, indirizzata ad intercettare aspetti ed elementi "latenti" nella società contemporanea al fine di interpretarli, tradurli e "incapsularli" in progetti, prodotti, servizi ed esperienze di vita portatori di caratteri e significati radicalmente nuovi.

In altri termini – all'interno di quest'ultima strategia – si punta a trarre vantaggio dal vedere aspetti che altri non riescono a vedere.

Le aziende di produzione, spesso, sono chiuse in una visione monodimensionale incentrata sul conseguimento di un'innovazione incrementale attraverso l'impiego di risorse interne. È il caso frequente delle piccole e medie imprese – numerosissime e prevalenti sotto il profilo quantitativo nel nostro Paese – con capitali finanziari limitati, prive di strutture di ricerca e di progetto; in altri casi, invece, in forma più lungimirante, si mostrano interessate ed impegnate a sviluppare una interazione con istituzioni e attori esterni all'impresa che fanno ricerca, interpretano, sperimentano.

D'altronde le aziende – nel loro ruolo specifico di organizzazioni del lavoro orientate prevalentemente alla produzione – non rappresentano le uniche

Paper Design. A research project by Lab MD
In business competitive processes, the research of innovation can be pursued through very different strategies and operating methods. It can aim for partial improvements to the analysis of requirements (through User-Centered Design), to design's contribution understood as the formal project (styling), or attempt to proceed in "leaps" (investing on technology). But it may also derive from a design-driven vision, focused on intercepting "latent" aspects and elements in contemporary society, in order to interpret, translate and "incapsulate" them into projects, products, services and experiences of life that are carriers of characters and significances that are radically new.
In other words - within this strategy - reaping advantages from seeing aspects that others are not capable of noticing.
Companies are often narrowed to a single-dimensional vision centred on the pursuit of incremental innovation through the use of internal resources (the frequent case of small and medium enterprises - several and prevalent in terms of numbers in our Country - with limited financial capital and lacking research and project structures). In other cases, instead, when showing a more farsighted vision, they manifest interest and are involved in developing an interaction with institutions and actors outside the company who engage in research, interpreting and experimenting.
After all, companies - in their specific role of labour organisations geared mainly

(e spesso neanche le più attrezzate) realtà attive nella identificazione dei mutamenti in atto (trend) e – soprattutto – dei fenomeni latenti non ancora manifesti ed evidenti nella società al fine di sottoporli all'interpretazione e alla loro virtualizzazione all'interno di potenziali stili di vita futuri attraverso nuovi progetti, prodotti, servizi quali risposte innovative per la società che evolve e muta.

Al pari dello "sguardo" esplorativo delle aziende, numerosi altri soggetti appartenenti a categorie professionali molto diverse fra loro sono attivi nello scouting dei significati emergenti e nella formulazione di soluzioni e proposte nuove: istituzioni di formazione, laboratori di ricerca, centri studio, artisti, architetti, designer, antropologi, sociologi, il mondo culturale in genere ecc.; tutti questi attori effettuano indagini sull'evoluzione della società, propongono narrazioni, interpretazioni e proposte sotto forma di report, visioni, scenari evolutivi, prototipi, artefatti materiali ed immateriali indirizzati a riplasmare le cose che ci circondano nel mondo contemporaneo.

La diffusione e la condivisione d'informazioni promuovono un confronto e un dibattito (esplicito, o implicito che sia) assimilabile a un laboratorio collettivo di idee i cui protagonisti sono legati fra loro mediante dei fili invisibili. È questo indubbiamente un terreno fertile, un humus al quale le aziende possono attingere per dare valore aggiunto alla loro azione strategica intercettando nuovi significati da tradurre in progetti d'impresa capaci di innovare – a volte anche radicalmente – sia gli aspetti materici e d'uso che quelli formali degli artefatti a servizio della società dell'oggi e, soprattutto, del futuro.

to production - are not the only (and often neither the most well equipped) enterprises active in identifying changes under way (trends) and, above all, latent phenomena not yet manifested and evident in society. The goal being to interpret them and virtualise them through new projects, products, services as innovative answers for a society that evolves and changes.

On a par with the exploring "vision" of companies, several other subjects belonging to different professional categories are involved in scouting the emerging significances and in formulating new solutions and proposals. Training institutes, research labs, study centres, artists, architects, designers, anthropologists, sociologists, the cultural world in general, etc. All these actors conduct surveys on the evolution of society, propose interpretations and proposals under the form of reports, visions, evolutionary scenarios, material and immaterial artefacts focusing on re-moulding the objects of the contemporary world.

The dissemination and sharing of information promote an exchange and debate (whether explicit or implicit) that is comparable to a collective lab of ideas, in which the protagonists are interconnected by invisible threads. And this is a fertile ground, a humus from which companies can draw resources to give added value to their strategic endeavour, intercepting new significances to be translated into business projects that effectively innovate - and at times radically too - both the material and usage aspects and the formal ones of artefacts in service of modern society and, above all, the future.

All'interno di questo contesto si colloca la missione e il networking di Lab MD – centro universitario di ricerca del Dipartimento di Architettura dell'Università di Ferrara – indirizzato ad affiancarsi e collaborare con isituzioni, associazioni di categoria, aziende, brand del Made in Italy al fine di creare processi di design-driven innovation.

I plus posti alla base della fondazione e delle attività di Lab MD non sono rappresentati da costose attrezzature o complessi laboratori strumentali, quanto da risorse umane, competenze e conoscenze transdisciplinari, asset relazionali che ruotano intorno ad un agile centro di ricerca strutturato in forma di network intercreativo e fortemente collaborativo.

L'apporto di Lab MD nei processi strategici d'impresa, più che essere incentrato sulla risoluzione di problemi specifici (problem solving), è indirizzato verso l'esplorazione di nuove visioni d'innovazione. Se la classe professionale, in genere, privilegia l'uso della creatività e del "progetto formalizzato" finalizzandoli alla messa a punto di soluzioni per obiettivi circoscritti, delineati e definiti in partenza, le attività di Lab MD puntano a produrre "conoscenza proiettiva" assegnando particolare valore al metodo, al processo di ricerca attraverso cui pervenire ad una visione più ampia e inedita degli scenari indagati.

Interessato, sin dalla sua fondazione, al linguaggio e alle tecnologie d'uso dei materiali sia tradizionali che contemporanei, il Lab MD ha promosso negli anni – in collaborazione con piccole, medie e grandi aziende o con associazioni e consorzi di produzione – esplorazioni e sperimentazioni che

The strategic action of Lab MD finds its natural context here, as the university centre of research of the Faculty of Architecture of the University of Ferrara, focused on working alongside and cooperating with institutions, trade associations, companies, brands of Made in Italy, in order to create processes of design-driven innovation.
The pros at the basis of the activity of Lab Md are not represented by costly equipment or instrumental lab complexes, but by human resources, transdisciplinary skills and knowledge, relational assets that revolve around an agile centre of research structured in the form of an inter-creative network.
The contribution of Lab Md to corporate strategic processes, more than being centred on the solution of specific problems, is focused toward the exploration of new visions of innovation. If the professional class, in general, favours the use of creativity and of the "formalised project", with the aim of coming up with solutions for well-defined goals that are precise and known from the onset, the activities of Lab MD aim at producing a "projective knowledge", assigning special value to the method and to the research process through which to come up with a broader and more in-depth vision of the researched scenarios.
Interested since its foundation in the language and technologies behind the use of materials, whether traditional or contemporary, Lab MD over the years has promoted, in collaboration with small, medium and large enterprises or with manufacturing associations or consortia, the exploration and experimentation that

hanno investito i modi d'impiego consolidati dei materiali stessi promuovendone evoluzioni e applicazioni inedite, innovative nell'architettura e nel design. La strategia di sviluppo dei progetti è stata quella di una *collaborative innovation* i cui poli principali sono rappresentati dal Lab MD (quale centro universitario di ricerca) e dalle aziende (detentrici di risorse finanziarie e di capacità produttive) con il coinvolgimento – in alcune esperienze particolarmente significative – di protagonisti di punta (figure visionarie) dell'architettura, del design, del mondo creativo più in generale, interessati ad esplorare entità latenti nel mondo materiale ed immateriale da tradurre, incapsulare e trasferire in proporste e/o artefatti non convenzionali.

In questo quadro generale s'inscrive la ricerca promossa da Comieco – in particolare dalla struttura operativa "Ricerca e Sviluppo" diretta da Eliana Farotto – ed effettuata, negli ultimi due anni, da alcuni membri del network di Lab MD.

La ricerca, approdata alla diffusione di una parte dei risultati con la pubblicazione del volume *Paper Design*, rappresenta la prima tappa di un progetto ambizioso che si intende sviluppare ulteriormente in forma aperta e dinamica sul web – all'interno della piattaforma digitale paperdesign.org – trasferendo le acquisizioni raggiunte ed espandendone l'indagine alle applicazioni dei materiali a base cellulosica nei tanti settori vivi ed attivi nella contemporaneità, come evidenziato dallo stesso volume: produzione, packaging, furniture, visual design cartotecnica, moda, stampa, ibridazione digitale, architettura, arte, riciclo…

has invested the consolidated methods for the use of the materials themselves, promoting their evolutions and unprecedented, innovative applications in architecture and design.

The strategy behind the development of the projects is what we refer to as collaborative innovation, wherein the main hubs are represented by Lab MD as university centre of research and by companies (which own both the craftsmanship and industrial manufacturing capacity), with the involvement, in certain significant experiences, of the key players of architecture, design and the creative world more in general, keen on exploring the potentials of materials in unconventional applications. The research conducted by Comieco, and in particular by the operating structure "Research and Development" headed by Eliana Farotto, and conducted in the past few years by some members of the Lab MD network, fit into this general framework, This research, which has published part of its results in the volume *Paper Design*, represents the first step of a more ambitious project that plans to develop the theme in a more open, extend and dynamic form on the web, as part of the digital platform paperdesign.org. The goal is to transfer the findings, expanding and developing further their survey to applications of cellulose-based materials in many thriving and active sectors in contemporary society, as pointed to in the volume: production, packaging, furniture, paper visual design, architecture, art, fashion, printing, digital hybrids, recycling...
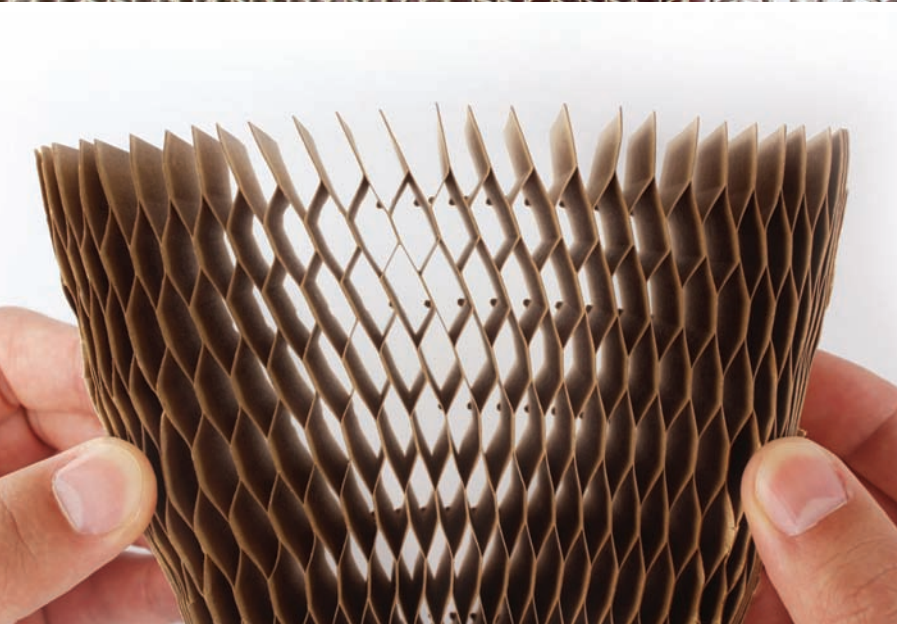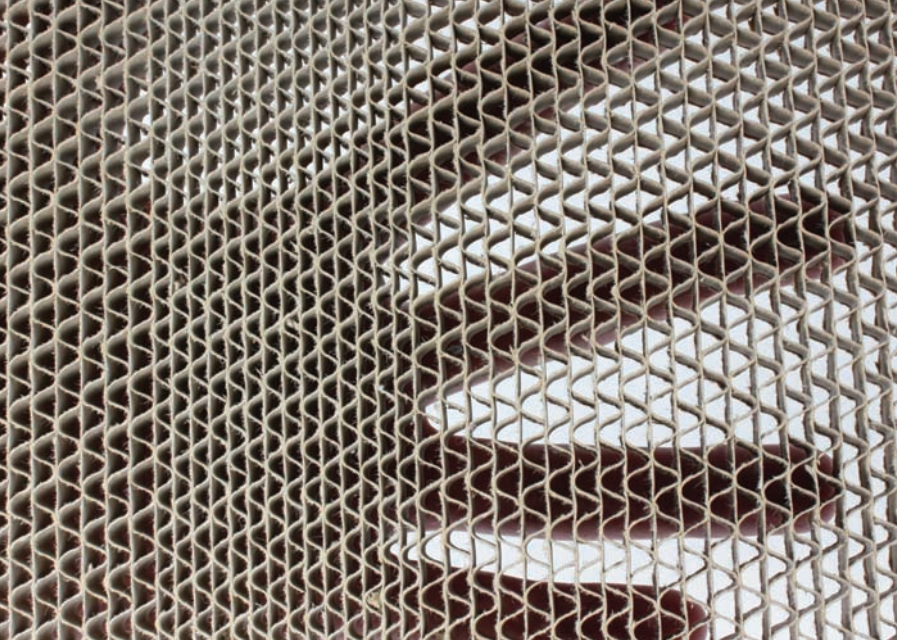
Core a nido d'ape. Wabenfabrik (DE).
Pannelli isolanti termico-acustici. Isolcel (IT).
Core a nido d'ape. Honeycell, Nonicel (NL).
Pannelli ondulati in fibra di cellulosa.
Wellboard (DE).

Honeycomb core. Wabenfabrik (DE).
Sound and heat insulation panels. Isolcel (IT).
Honeycomb core. Honeycell, Nonicel (NL).
Corrugated panels in cellulose fibre.
Wellboard (DE).

Considered fundamental to knowledge of the history and techniques of Italian paper-making is the series Storia della Carta (1986-2010), edited by the Pia Università dei Cartai, the descendent of the Medieval guild of paper-makers in Fabriano, whose legacy continues today through the Fondazione Gianfranco Fedrigoni, Istituto Europeo di Storia della Carta e delle Scienze Cartarie (Istocarta).

[3] See Peter Tschudin, *La carta. Storia, materiali*, tecniche, Rome, Edizioni di storia e letteratura, 2012, pp. 375.

[4] In ancient Egypt papyrus was considered a divine material, and the term used to designate it meant "of the Pharaoh". The etymological root

has passed into the lexicon of many languages, as "paper" in English, "papier" in French and German, "papel" in Spanish and Portuguese.

The etymology of the Italian term "carta", from the Latin "chàrta", is uncertain. The most creditable hypotheses link it with the Greek verb "charàsso", I sculpt, I engrave (hence the Greek "chàrtes") or the Latin "quarta", leaf folded in four.

[5] Pierre-Marc De Biasi, "Naissance. Les origines chinoises du papier", pp. 24-40, in *La saga du papier*, Paris, Arte éditions, 1999, pp. 260.

[6] The ancient technique of "tapa" (o "kapa") is recorded in the far East and Oceania. This was a method of

producing clothing, which led to the manufacture of some rudimentary forms of paper. The inner part of the bark from the mulberry tree (Brussonetia papyrifera) was beaten with mallets then soaked in water, becoming a fibrous paste which, when pressed, formed a fleecy sheet which could be used as a fabric or as a medium for writing. Alessandro Castiglioni, Dizionario delle carte antiche (in www.segnideltempo.it).

[7] The production methods nearest to paper are "non-woven fabrics" (such as rafia and tapa), which also involved drying a fibrous mixture and sometimes also a supporting wet screen to give the shape.

[8] Din Standard 6730 - 1988, in Peter Tschudin, *La carta. Storia, materiali, tecniche*, Rome, Edizioni di storia e letteratura, 2012, p. 17.

[9] There are numerous contributions concerning traditional methods of paper production. Outstanding among them are publications by the Fondazione Gianfranco Fedrigoni, which continues to publish, promoted by the Pia Università dei Cartai (istocarta.it).At the present time, professional qualifications for paper production are obtained by specialised training courses held under the supervision of and in collaboration with the AFC (Associazione per la promozione della Formazione
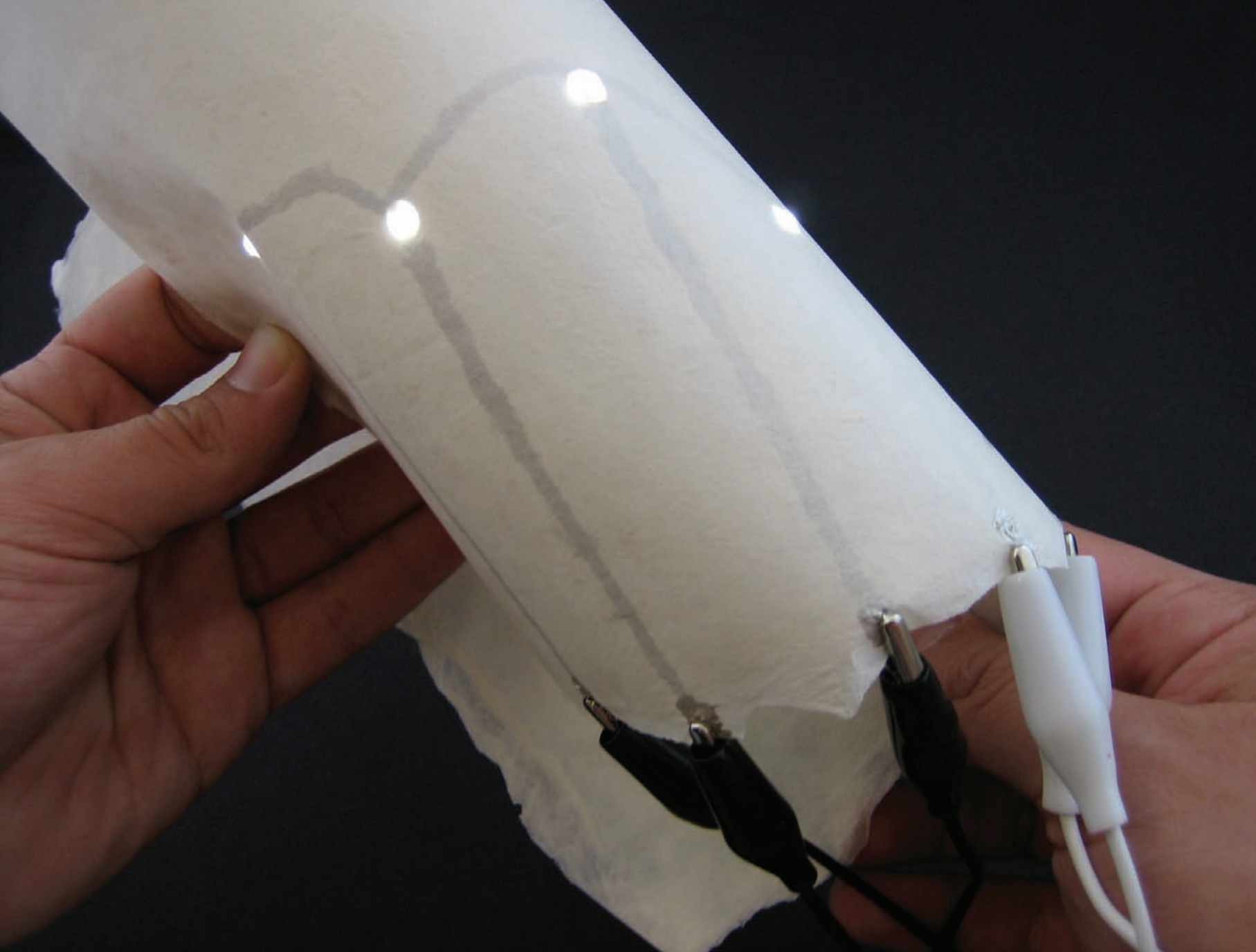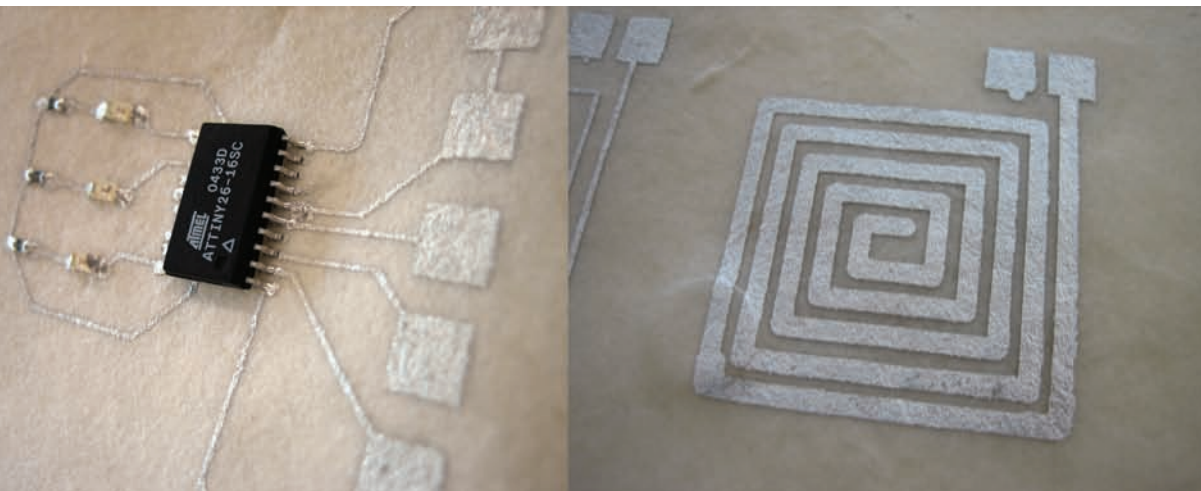
Progetto *Pulp-Based Computing*. Particolare con led integrati nella carta e intrusioni nella cellulosa della carta di sensori e microprocessori. (Marcelo Coelho)

Marcelo Coelho's *Pulp-Based Computing*. Detail with LEDs integrated into paper and intrusions in cellulose of sensors and microprocessors.
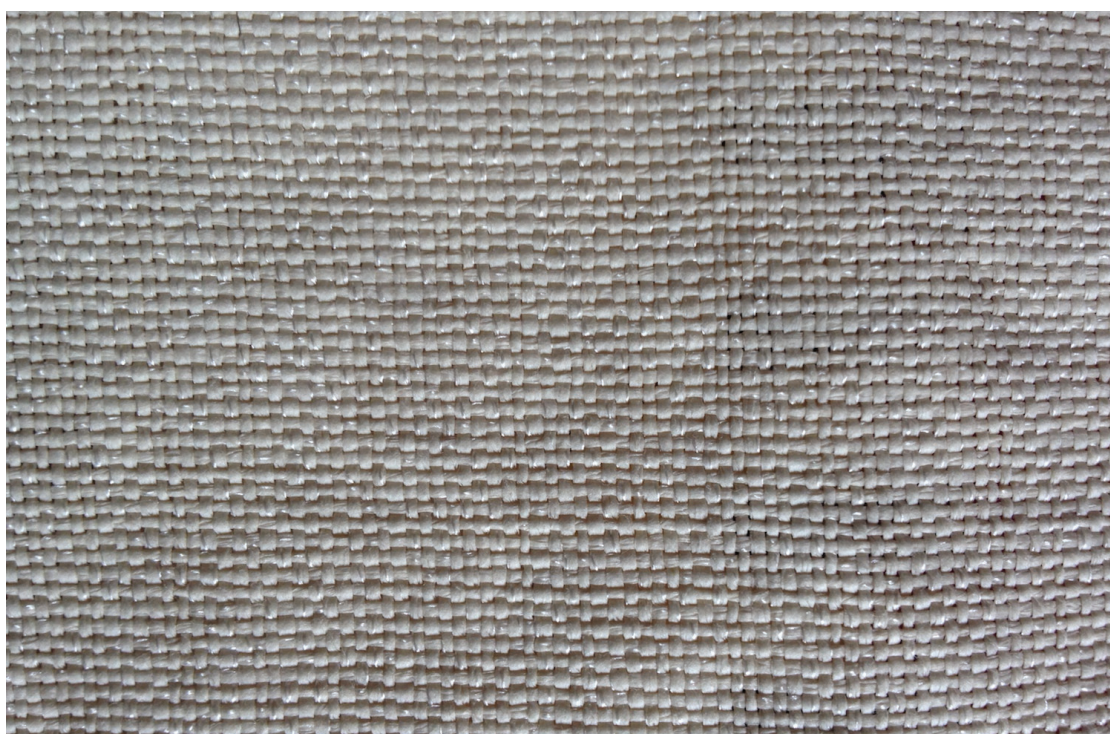
Tessuto intrecciato a giro inglese con
il 18% di carta dell'azienda Texmoda
tessuti, Prato.

Leno woven fabric composed of 18%
paper from the textile company Texmoda,
Prato.

Tessuto in carta 95% e 5% seta
del Lanificio Ricceri, Prato.

A 95% paper and 5% silk textile
by Lanificio Ricceri, Prato.

so") puzzles, construction kits of recycled cardboard tubes with which children are encouraged to build their own toys, using Y, O and X-shaped hinges.
Another interesting example is in *Koontz Toys*, a series of educational toys in recycled cardboard that allow the creation of a pendulum, a kaleidoscope, a clock and a padlock.
Therefore, the material, which is well suited by its nature to explaining and emphasizing the potential of recycling and the importance of resources and their sustainable use, communicates an eco-message ever more important even in the world of the play.

Casa Cabana di Kidsonroof straordinaria nella versione di una casetta nel bosco incantato, realizzata dall'artista e illustratrice Agathe Singer.

Casa Cabana by Kidsonroof is an extraordinary version of a little house of an enchanted forest, created by the artist and illustrator Agathe Singer.

David Graas, sgabelli *This Side Up*, 2005.
David Graas, *This Side Up* stools, 2005.

and continuously regenerate, of open and multiform identity, united, in any case, by the need to return value to everyday gestures, participating emotionally in intellectual and manual activities performed directly, in search of synthetic and iconic expressive forms [6].

If the nomadism of today develops patterns of social interaction that are largely independent from the identity of the places and the materiality of media, it then re-proposes both a balanced and respectful approach practiced by ancient nomads towards environmental resources and material cultures found from time to time on their journey. Thus the new nomad triggers dynamic virtuous relationships with local contexts in which he works temporarily and, in developing systems of the most autopoietic possible of processes and products, becomes an active protagonist of a harmonious relationship with nature and with society as a whole [7].

In light of this analysis, it is easy to understand that the contemporary nomadic phenomenon constitutes a reference, or rather a fertile scenario of development, for specific design marked by a strong attitude towards experimentation, by a decided independence from the constraints of large scale production and by a strict adherence to the needs and expectations of the user. This is a project that seeks to satisfy new anthropological models, before economic logic, to face contextually problems concerning the comfort of the individual and the environmental and social sustainability of communities, through a conscious participatory and widespread practice [8].

The design nomad, that arouses our interest and that we intend to appreciate in this context, is, in short, at once practical and visionary, local and global, essential in configuration but rich and complex in meaning, in a series of stimulating contrasts that Victor Papanek prefigured in 1973 in his volume *Nomadic Furniture*, first published in the United States and translated in the following years worldwide. The work, written by the American designer in collaboration with James Hennessey, presents itself like a real manual for the self-production of transportable, transformable, recycled and recyclable furniture and objects. It includes mention of tables, chairs, cabinets, dressers, lamps and many other equipment realizable in paper, cardboard, wood, plastic or textiles by reusing packaging, containers of various
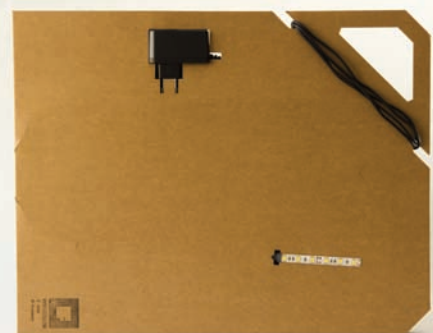
Fattelo!, *01 Lamp*, 2012.

Paked Pavilion, Shanghai, 2010. Progetto di Min-Chieh Chen, Michele Leidi e Dominik Zausinger (CAAD ETHZ), con la collaborazione di Jeannette Kuo e la supervisione di Tom Pawlofsky.
Packed pavilion. Shanghai, 2010. Project by Min-Chieh Chen, Michele Leidi and Dominik Zausinger (CAAD ETHZ), with the collaboration of Jeannette Kuo and supervised by Tom Pawlofsky.
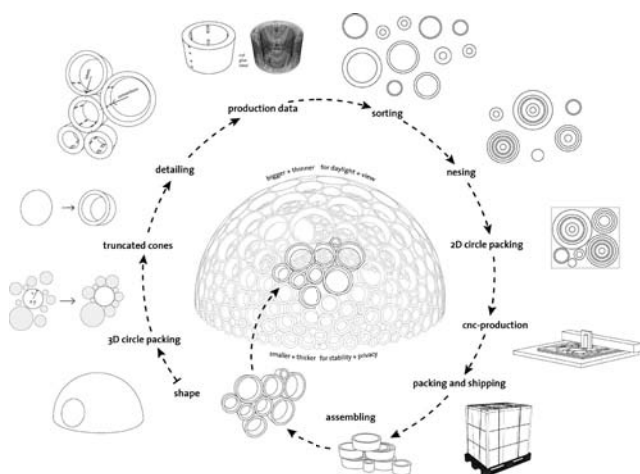

overlapping multiple sheets seemed to bring multiple benefits in terms of production, structure, logistics, transport and assembly. The explicit systematization of data oriented the designers to explore this possibility. The use of a specific algorithm allowed the combination of variables involved and the description of a three-dimensional surface obtained from a network of rings of different sizes and characteristics, defined by the position and structural behavior of each within the system as a whole. The 409 rings, numbered and classified using an alphanumeric code, had recesses in their inner surfaces within which to fix the connector ties. The connectors were uniquely identified by printing reference codes onto their surfaces identifying adjacent positions in order to facilitate the assembly of the system and eliminate the need for manuals, instructions and graphical figures [11].

The development of the project on a parametric basis also enabled the optimization of packing for transport. Smaller rings could be lodged inside larger ones to significantly reduce the shipping volume (about 1.2 cubic meters in total) of the pavilion, whose overall construction required:
- 1900 sheets of corrugated cardboard of 1.8x1.25 m
- 1 cutting machine working 24 hours a day for 10 days
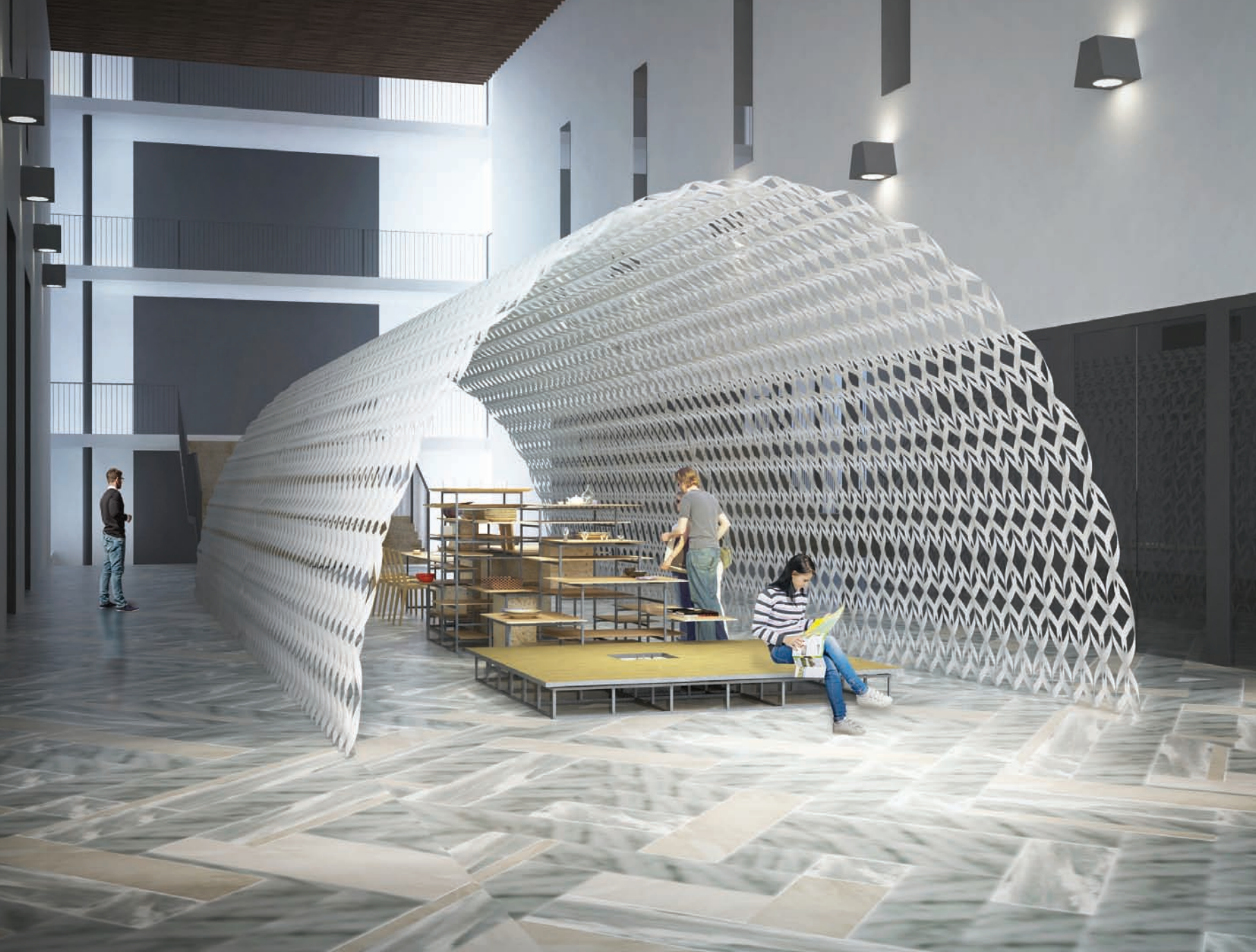
Irori Pavilion, Kengo Kuma & Associates, FuoriSalone 2015,
Università Statale di Milano.
Irori Pavilion, Kengo Kuma & Associates, FuoriSalone 2015,
Statale University of Milan.

blue. The same analysis was done for translations along the global Z-axis, obtaining results with a range between 0.18 cm and -0.40 cm. Finally, the study of N 1-1 tensions provided normal stresses, or rather effects which generate compressive and tensile stresses compression in the 1-1 direction. The chromatic map indicates positive tensile stresses and negative compressive stresses. This brief overview of very recent design experiments clearly shows how the spread of a parametric design approach, together with advances in research in the field of product innovation and processing, has encouraged the development of a 'new idea of architecture' ever more

interpreted as a energetic/synergistic system, the global characteristics of which are increasingly treated as an adaptive organic system that interacts with modifications of the environment in which it is inserted. "This means that partial aspects of building systems that are currently considered in isolation within design methodologies, such as structural technology, physical construction techniques or space organization criteria, become part of a generative process of integration that directly includes the complex interrelationships between material system and performance capacity" [25]. These are experiments which, while not yet widely felt, certainly offer

indicators of possible future scenarios. Moreover, corrugated cardboard is a relatively young material, dating from 1875 when J.H. Thompson had the intuition of pasting a second covering over corrugated paper, thus giving greater rigidity to packaging structures. In architecture its history is, today, only at a beginning and its destiny is still to be written. As Deyan Sudjic reminds us, "The history of architecture should be seen as a history of social and technical inventions, rather than stylistic and formal innovations" [26].

NOTES

[1] «Il successo professionale di Richard Buckminster Fuller è legato, più che alla ricerca Dymaxion, allo studio e alla costruzione di strutture geodetiche autoportanti. Conformemente al suo brevetto del 1954, ne sono state costruite ben 300 mila sparse in ogni angolo del mondo, dal monte Fuji al Polo sud. Fra le più significative: la cupola Kleenex in fogli di cartone piegato presentata alla X Triennale di Milano (1954)» [The professional success of Buckminster Fuller is related, rather than research into Dymaxion, to the study and construction of self-supporting geodesic structures. In

Perino & Vele, *Giovanni, Mimmo, Ciro, Francesco, Alessandro, Nicola, Giuseppe, Paolo, Mario*, 2006; cartapesta, ferro zincato, tempera.

Perino & Vele, *Giovanni, Mimmo, Ciro, Francesco, Alessandro, Nicola, Giuseppe, Paolo, Mario*, 2006; papier mache, galvanised iron, tempera.

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