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Design-driven industrial conversion during COVID-19 global outbreak

A systemic business strategy and design approaches to face complex market crisis.

Eva Vanessa Bruno, Beatrice Lerma

This paper highlights the evolution of designers' responsibility during an unexpected emergency period like the COVID-19 outbreak. This process will be described through a set of case studies showing that the design discipline is resilient and capable of gathering the proper needs at the right time and relieve market tensions. Indeed, designers can help companies in the process of industrial conversion, an ambidextrous strategy that allows producing what is missing but extremely urgent during an emergency. The paper describes via case studies the way firms converted to produce necessary goods such as clean hand sanitiser, lung ventilators and the personal protective equipment needed by citizens and medical personnel. During the COVID-19 emergency period, what are, and have been, the challenges for designers? What new expertise, skills, activities will the designer have to gain? How designers give innovative answers with new activities to support companies during emergencies? The answer was found in the designers' ability to examine the problem holistically and choose the most innovative and contextually appropriate solutions. Together with management ingenuity, they also fit in with ambidextrous strategies that direct the company towards new opportunities by exploiting the resources already belonging to the firm, untangling the economic complexity.

Keywords: Design for Emergency; Industrial conversion; Ambidexterity; Innovation management; Market tension

Introduction and background

In the modern global economy, pioneering and disruptive business strategies has become a central topic for dealing with complex market crises. Strategic, systemic designers and innovation managers can play an essential role in addressing the challenge of new business models and mitigate market tensions.

Design for emergencies is not currently widespread in the mosaic of the disciplinary areas of design research in Italy, according to the Design Research Map (Bertola et al., 2018) by SID (Italian Design Society). However, the role of designers becomes relevant in all those situations where time is a crucial factor because designers suggest long-lasting practices and processes, not temporary solutions (Traldi, 2020).

The "emergency" is defined as a permanent and implicit condition of contemporary society (Piscitelli, 2019) because of the presence of prolonged crises, such as the climate change that the whole world is facing. However, this condition of permanent emergency has been strengthened with the COVID-19 outbreak because it awakened society from the habituation to the state of emergency. Indeed, the COVID-19 global pandemic was an unforeseeable event that had overturned political, economic and social structures since 13th January 2020, when the Chinese government announced the first case of a novel coronavirus recorded in November 2019.

This study provides new insights into the designer's role during the COVID-19 outbreak: designers from all over the world have proved to react to the emergency based on their attention on human needs, especially needs that do not yet exist are still unknown. According to Donald Norman, designers answer the question: "how do you discover a need that nobody yet knows about?" (Norman, 2004, p. 70). How to respond to those needs before the system collapses? In this paper, the authors aim to show the design contribution for the COVID-19 global

emergency in Italy and abroad through a selection of case studies with immediate and short-term effects of industrial conversion. Firms switched a part or all of their production to manufacture much-needed personal protective equipment (PPE) and medical devices. Industrial conversion has been a winning strategy not to close firms, continue producing goods, respect safety measures, and help countries supply medical equipment. It was essential in Italy due to the lack of medical devices and PPE like masks, ventilators, scrubs, gloves. Indeed, Italy was not autonomous in terms of their production, and some medical supplies purchased abroad have been blocked at the border by the producing countries. The fear of running out of these precious pieces of equipment has reduced or suspended exports, causing inconvenience to countries that needed them.

The paper argues that designers who collaborate with risk managers can work to forecast emergency needs that do not exist yet, get the market ready for upsetting events with design-driven innovative projects (Verganti, 2019) and new methods of using services and products.

Industrial Conversion to re-open closed firms

The industrial conversion is an ambidextrous strategy (Duncan, 1976) that allowed companies to enter higher-demand production sectors through new plants or the transformation of existing ones, maintaining high manufacturing know-how. Below are some examples of industrial conversion in the COVID-19 pandemic, proof of the desire of companies to find new opportunities achieving the demand for equipment avoiding plants closure.

Textile firms: masks and scrubs

The need for surgical masks has been met by fashion companies, which have used their implants to produce non-woven fabrics (TNT) and so-called community masks. Companies like Armani, Bulgari, Prada, Miroglio, Calzedonia, H&M started running their plants to produce scrubs and masks with TNT supplied by other companies. Companies that produce sportswear, like Santini, have used their technical fabric to produce washable and reusable masks. Even when the plant could not open, the seamstresses of Scervino, from Florence, sewed masks and scrubs from home with the fabrics that the company had bought on purpose.



Figure 1: A Worker Irons Masks in the Atelier Miroglio Headquarters in Cuneo, Italy. Source: Bertorello 2020

Fabric and filter material suppliers have made their contribution too. The company Ahlstrom Munksjo is a helpful example. Its plant in Turin produces non-woven fabric to filter diesel fuel. Due to the emergency, they have identified this production line as filter materials suitable for the virus.

Alcohol and perfume firms: sanitizer

Sanitising gel was another good missing immediately from supermarkets and pharmacies at the beginning of the pandemic. Firms that produced alcohol converted their plants to produce denatured alcohol (tax-free), made with a chemical process that makes undrinkable edible alcohol (not tax-free, which is more expensive than the previous one). It has classic pink colouring. For example, Bacardi partially converted the Martini plant in Pessione (Turin, Italy), supplying denatured alcohol to the local community and the Red Cross. This new production was not affecting the production chain of the products in the company's portfolio, but it expanded it. Big companies such as Campari (Milan, Italy), Amaro Ramazzotti (Milan, Italy) and brewery BrewDog (Ellon,

Great Britain) and also small local distilleries did the same. In these cases, part of the production has been devolved free of charge to the Civil Protection, partly for sale, in small quantities, to make up for supply difficulties in supermarkets.



Figure 2: BrewDog's beer bottle hand sanitiser packaging. Source: insider.com.uk 2020

Luxury cosmetic and perfume companies like Christian Dior, Guerlain, Givenchy, Bulgari switched the production lines from perfume to hand sanitiser, exploiting the pre-existing ethyl alcohol supply chain.

Mechanical firms: ventilators

The final analysed product is slightly different from the two previous ones, as it is not a common good. However, it is intended for hospitals and first aid: mechanical lung ventilator. It is a mechanical ventilation machine to help patients with respiratory failure, one of the most severe COVID-19 symptoms. The ever-increasing demand for lung mechanical ventilators due to the high number of patients with respiratory failure has led to the use of a single ventilator for multiple patients (multiplex ventilation). However, studies have confirmed several risks (Chatburn et al., 2020). Therefore, firms with high technological content, especially in the automotive sector, converted their plants to produce lung mechanical ventilators. Big companies like Lamborghini, FCA, Mercedes, Ferrari, General Motors, Ford, Tesla started to produce ventilators, like Ferrari's FI5 fan, which can be mass-produced using materials that are easy to find. Manufactured ventilators have a much lower cost than ventilators currently available on the market. Other non-automotive companies contributed, too, like NASA, Belkin, Fitbit.



Figure 3: FI Ventilator by Ferrari. Source: Ansa 2020

Designers, universities and local SMEs: pre and post COVID-19 approaches

In this section we describe the relationship between designers, companies and industries from the 1990s to the present. The authors proposed a categorisation according to Germak (2014) and expanded it with different approaches due to the COVID-19 outbreak.

In the 90s, companies proposed collaborations with designers within universities to define a new product or a new collection. The answer from universities was not simply applied creativity but a breakdown of the problem that offers a meta-design project as output. In the 2000s, the companies' demands changed radically: designers

did not answer: "What to do?" but "Where to do?". (Germak & De Giorgi 2008). As explorers, they aimed to find new markets, new products, or to produce innovation discovering potential or hidden design opportunities. In the second decade of 2000, the role of the designer within the company changed once again. They became those figures able to connect different knowledge and coordinate it, creating interaction between team-members, key figures within cross-functional teams. In the last ten years, companies have been looking for more specialized figures, such as product designers, graphic designers, service designers, and system designers. Besides, designers in the companies also deal with research and development and with the team and process managing (Cooper et al., 2009). Designers can merge, thanks to the collaboration with other experts, skills related to project management and organization, communication, marketing research and business management (Eroglu & Esen, 2016). In addition, in recent years, there has been an evolution in the target market of projects. The consumer was the real object of the brands' campaigns, but now they want to communicate to the prosumer as an active user and producer of information simultaneously. The designer now designs objects and advertising campaigns for these new consumers through a careful analysis of the environmental market (Tapscott & Williams, 2010).

During the COVID-19 health emergency, the relationship between designers, companies and universities strengthened. In fact, with the forced closure of the spaces of the university and the facilities, they have brought into play what they could: intellectual resources on the one hand and technical expertise on the other. This synergy has allowed designers and researchers to respond to the health emergency, designing community masks, applications to manage queues, and delivering goods, no-touch tools to interact with objects safely, advertisements, and infographics. How can universities or design-oriented research centres and designers help companies during the COVID-19 outbreak? Design can be helpful in three main aspects: environment sanitising, respect for social distancing, and products' dematerialisation. As far as the sanitisation of spaces is concerned, designers could orient their project to sanitising products, such as UV lamps, automatic gel dispensers, portable ozone generators, and surfaces with antibacterial treatments.

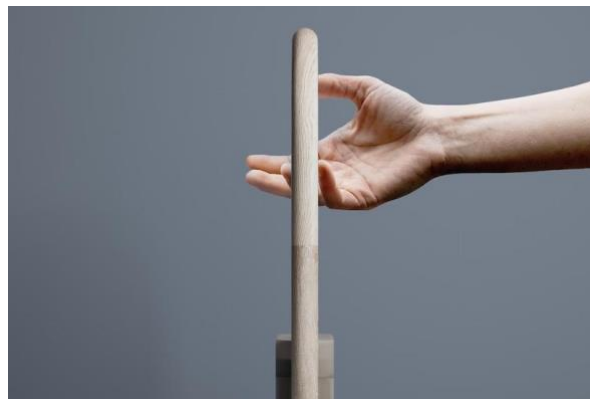


Figure 4: Hand Sanitizer Loop. Source: JPA Design 2020

Concerning social distancing, designers could realise products such as totems, dividers, protective devices, and stickers, infographics, and advertising from a graphic point of view.



Figure 5: Wave Social Distance Signage. Source: studio 5-5 2020

Finally, the services designer and UX UI designers could be the protagonist of the digitisation of actions or enhancement of all the services used to contact people. That now cannot be done to avoid the spread of the virus. There are many examples, such as new queue-jumping applications for supermarkets and post offices, QR-readable menus, online shopping or virtual dressing rooms, panels to entertain during the queue.

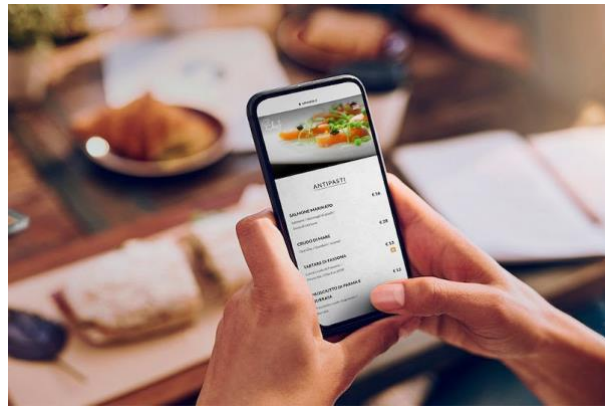


Figure 5: Safetable, QR Code Reader for Digital Menù. Source: barro 5-5 2020

Final Considerations

Design expresses its full potential when people chase away the idea that design is only about something beautiful. As Vignelli (2011) said, "the function of design is to design things that always last, not ephemeral. When something is ephemeral, it is worth what it is worth: nothing". Designers look from other points of view at the products and spaces to be used after the emergency. People will probably have to get used to spaces that were previously considered closed, open, inspired by biophilic design (Söderlund, 2019), to be in public space where products or graphics remind us to be careful and not to be too close, to talk through a mask, and to eat in a restaurant with plastic barriers.

Designers, universities and companies have shown that they can work together to manage market tensions. For this reason, the authors believe that the industrial conversions analysed in this paper will be carried on, in parallel with the previous production, in a reduced size to add products to the portfolio. Industrial conversion during the health emergency has shown how it is a helpful tool to answer new questions and find new technological challenges.

Will the state of permanent emergency ever end? What should we be ready for in the future? There are many questions about what will happen in the coming years and how designers will deal with future problems. How might designers rethink homes to better support the remote working and workplaces and school and universities during social distancing? How might care of sick or weak people when visitation or is not safe? How might designers rethink place-based and presence-based activities to be successful virtually? More generally: how will designers plan in the future? For short, medium- or long-term emergencies?

The figures who will find new design proposals to respond to new emergencies (related to the environment, health, social and war) will be the systemic designers, the strategic designers and the designers for the emergency in collaboration with a risk manager. Together they can bring design-driven innovation (Verganti, 2019). Universities should, therefore, work to educate and train these professionals, who will be the designers of tomorrow.

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