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INNOVATION

Frugal Innovation to Tackle COVID-19

by Mokter Hossain

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Frugal innovation is a recent phenomenon, showing how to solve problems differently & affordably.

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The COVID-19 pandemic has led to a significant disruption in our lives, work, and business. It hit most of us as customers stopped buying, buying less, or less supply. People started coming up with innovative solutions speedily to meet their essential needs. Individuals, companies, and public authorities started to work together or separately to develop innovation to combat the COVID-19. Innovations are developed by cutting conventional corners to speed up the process to cope with the pandemic. Such solutions are termed as frugal innovations—quality solutions developed under resource constraints by using used, underused, or discarded materials to serve the basic needs of un(der)served customers. Frugal innovation is a recently emerged phenomenon, which shows how to solve problems differently and affordably as depicted here.

Frugal innovation around the world

Developing frugal innovation, especially repurposing resources at hand is essential to tackle the COVID-19 crisis. Using a set of keywords, I have done a comprehensive search on frugal innovations that are developed for the COVID-19 crisis. After pursuing analysis of these innovations, I have found 138 frugal solutions. Frugal solutions have emerged from all around the world. The COVID-19 compelled people to look for solutions that meet their budget constraints and conform to sustainability goals. The analysis revealed that technologies, such as frugal 3D printers and robots are developed or used to tackle the COVID-19 crisis. Low-cost masks and ventilators are developed rapidly across the world. These solutions are useful to fulfill the necessity of the Covid-19 time. Exaptation is a key driver to tackle the COVID-19.

Corporations are rushing to make affordable medical supplies. New types of partnerships have emerged to find frugal solutions. Many international organizations such as the United Nations Development Programme have taken many initiatives to support such solutions. Haco Industries in Africa and East African Breweries are two large companies in Africa, who collaborated to produce frugal sanitizers. The Kenya Association of Manufacturers has come up with a simple ventilator untrained medical staff can operate for four hours in the off-grid electricity areas.

Another leading Kenyan firm collaborated with Safe Hands Kenya to develop medical equipment. Such endeavors develop new partnerships to cost-effectively meet customers' needs in challenging environments. The Kenya Association of Manufacturers has developed a ventilator that untrained medical staff can operate in off-grid electricity regions for up to four hours. The COVID-19 has provided relaxation of strict regulation of normal time.

The endeavor to tackle the crisis stemmed from the COVID-19 has taught us some important lessons for innovation. Frugality is a good starting point to tackle the pandemic crisis. Each of us tries to enhance creativity to find solutions for others and ourselves. DIY has become a new normal practice. In the same vein, the maker movement nourishes hacker culture to develop new devices and tinkering with existing devices. Makers are predominantly enthusiasts and hobbyists. The world's largest non-government organization BRAC's maker space initially used 3D printers to produce PPE but to attain faster productions it uses laser cutting and computer numerical control machines. The World Bank has founded seven university-based fab labs in Bangladesh for digital fabrication and manufacturing before the advent of the pandemic but they have become valuable during the pandemic to develop PPE.

Individuals know better how to focus on building a minimum viable product quickly and make the product better over time. Frugal solutions are meant to tackle the problems people face during the COVID-19. Therefore, getting instant feedback from the customers helps to improve the solutions with interactions. The COVID-19 has induced frugal products such as face shields, drones, masks, and ventilators. For example, a student in Spain makes face shields using a 3D printer at home, which protects health workers from patient cough droplets. Open-source enthusiasts developed various DIY tools. Robots are used to detect COVID-19 cases so the medical personnel can spend time on more important tasks. Robots are useful to offer frugal services. They can perform surgery in inaccessible places and carry transport dangerous medical substances, monitor patient status, alert nurses, deliver food, medicine to patients and conduct various research activities. Mobile apps help to maintain social distancing and contact tracing to monitor virus spreading. Similarly, drones are used to check heart rate, body temperature, and evaluate cough. Marut Dronetech in India manufactures drones to check the temperature by thermal imaging and monitor social distancing rules. There are restrictions on drone

flying but drones are permitted to combat the COVID-19 crisis. Zipline drones received quick approval from the US Federal Aviation Administration to deliver personal protective equipment of two kilograms to hospitals with 48 km round trips up to a flying speed of 80 mph. In the UK, a drone called Pouncer can accurately reach an emergency site with food, water, and medicines.

Like robots and drones, 3D printers are crucial to tackling the COVID-19. 3D printers enable individuals to do rapid prototypes. With the spirit of DIY, many individuals have developed face shields. Hobbists, manufacturing firms, and professional firms use different DIY concepts to develop safety equipment for the frontline workers. They use 3D printers, waterjet cutters, and lasers to make facemasks, face shields, prosthetics, and ventilators. There are examples of developing 3D printers from discarded materials. For example, a resourceful inventor from Africa developed a $100 3D printer using discarded and used materials, such as thrown computers, broken scanners, printers, and other e-waste. Artificial intelligence is used to conduct mass medical tests remotely and efficiently using scarce resources and frugal equipment. Mobile platforms are used to provide distance learning. Many affordable online platforms are offering education where access to the Internet is available. An education platform in Bangladesh called the 10 Minute School offers education services to the students of one to twelve classes and university entry exams. In east Africa, using artificial intelligence, M-Shule provides services to learning, data collection, and skill development over text messages. In areas with weak Internet, SMS-based ride sharing provides affordable services during the COVID-19. In some developing countries, finding authentic medicines is a challenge. Mobile SMS is a way to verify drug authenticity. SMS service called GoldKeys is used in African countries to verify the authenticity of medicines by sending a code from the label to a phone number.

Given that domestic violence has increased significantly during the COVID-19, many organizations have developed apps to prevent such violence. For example, UNDP has developed an app to support domestic violence to help the victims in Montenegro. Crowdsourcing is a valuable means to find solutions together and fast. The Indian national government launched the BreakCorona campaign to crowdsource solutions to tackle the COVID-19. The campaign received around 1,300 ideas and 180 product solutions in two days. The demand for telehealth services are growing to provide last-mile delivery. The COVID-19 has made it more relevant and necessary. Telehealth is the only option in some

locations in developing countries; it has become highly important in developed countries during the pandemic. THSL offers telehealth services in the UK and Europe using artificial intelligence. It allows clinicians to spend more time on inpatient care.

Lessons from the COVID-19 for frugal innovation

The COVID-19 has compelled us to do things affordably. The importance of frugality has emerged as high relevance for the COVID-19. It shows the importance of innovation from everywhere. Many developing countries have learned innovative ways of doing things. People have made various things from used materials, underused materials, or discarded materials to combat the COVID-19. Artificial intelligence, big data, robots, drones, 3D printers, DIY, and the maker movement are all-important to develop frugal products and services to tackle the COVID-19. Affordability is the key determinant in purchasing decisions as many people lose their jobs and have less income. Hence, frugal products are their main choice for customers. Even though frugal innovation is initially meant for developing countries, its importance is high in developed countries, too. Therefore, practitioners and policymakers may embrace frugal innovation to solve many challenges we face.

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