Design Thinking for Innovation: Solutions for Social Distancing

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Abstract: **Social Distancing is a buzz word after Covid-19. Due to pandemic disease every person must maintain social distance of 3 metres to prevent the spread of the disease. The problem is how to maintain a social distance of 3 metres in an industry, or in a hotel or in a public transport place or a School or College. There is no vaccine as of now and we must protect ourselves in public places to mitigate the risk of this disease. We cannot stop our daily activity after exit plan of lock down. There should be some solution to mitigate the risk of Covid-19 in our daily life. This gives us an opportunity to think in a Innovate way to design the workstations in Hotels, Industries, Colleges, Public transport transit points. This paper highlights the design thinking of Innovation for social distancing solutions in various industries are discussed.**

Keywords: **Covid-19, Social Distancing, Design Thinking, Innovation**

I. INTRODUCTION

Health, Safety and Environment is important dimension when compared to other functions when reopening of the restaurants, shopping malls, supermarkets, and schools after lock down due to Covid-19 pandemic disease. We must maintain a social distance of 6 ft to minimize the risk of transmission of Covid-19. World Health Organization is giving various guidelines how to maintain a social distance in public places from time to time. In the following paragraphs I am explain about Social Distancing, How the Design Thinking approach will create Innovative solutions will be discussed. At the end various types of Social distancing solutions are highlighted.

II. SOCIAL DISTANCING

According to Merriam Webster Dictionary the definition of social distancing "*The practice of maintaining a greater than usual physical distance(such as 6 ft or more) from other people of avoiding direct contact with people or objects in public places during the outbreak of a contagious disease in order to minimize exposure and reduce the transmission of infection*"

According to Government of Canada Public Health services Physical Distance means

1. Avoiding crowded places and gatherings
2. Avoiding common greetings and handshakes
3. Limiting contact with people at higher risk (Oder adults in poor health)
4. Keeping a distance of at least 2 metres length from others

The following are the various methods are designed to make the social distancing

1. Encourage colleges and schools remote learning and online instructions.

2. Cancelling the various sports events
3. Cancellation of Conferences and business meetings
4. Flexible work options
5. By limiting the community transmission, the curve can be flattening.

According to Centre for Centres for Disease Control and Prevention (CDC) Social Distancing also called physical distancing means
1. Maintain 6 ft or 2 meters arm length
2. Do not gather in groups
3. Stay out crowded places or mass gatherings

The following are the guide lines issued by CDC for Social Distancing.

1. If you go to a grocery store or a shop maintain 6 feet distance from others. Consider other Option of delivery by mail order.
2. Mouth and face should be covered with cloth face covering.
3. Work from home whenever is possible
4. School or college go for digital or distance learning option
5. Limit use of public transport, ride sharing taxis

III. DESIGN THINKING FOR INNOVATION

Covid-19 gives us an opportunity to create new things. This crisis will continue how much time nobody knows as of now. The only solution is to address this problem by thinking in a different way. Design thinking a tool to create a various solution in a systematic way. The innovation has shifted from engineering driven to design driven, product centric to customer centric, focussing marketing to user experience. The design thinking approach will minimize the uncertainty and risk of innovation by using collective intelligence to understand the customer needs. The key element is lead, explore, create, and innovate like a designer (1). Fig1. Shows the various stages of design thinking process.
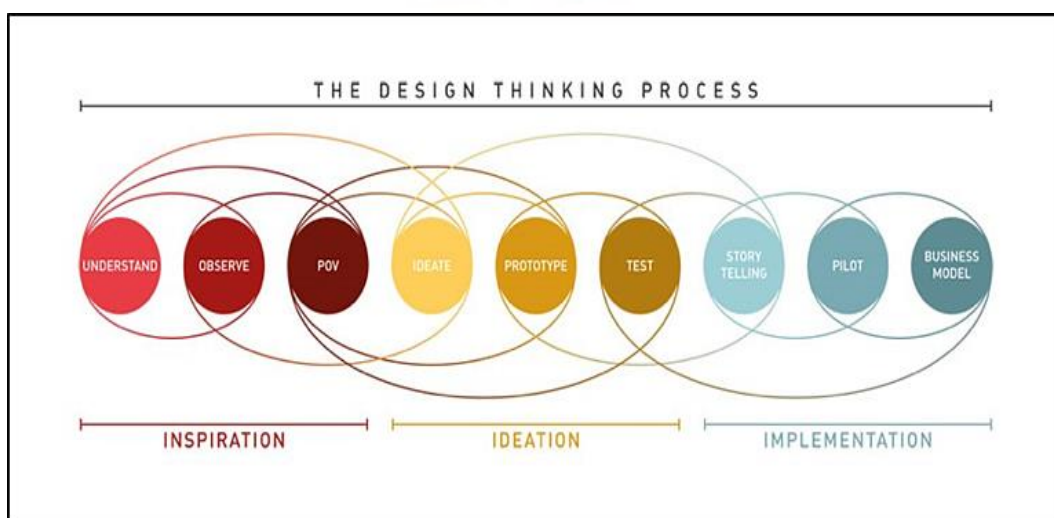

Fig1. Design Thinking Iteration Process (1)

Design thinking helps to innovate product development clarity, viable, feasible solution. Design thinking will lead to incremental innovation or helps in to solve specific problems or challenges. One of the important elements in design thinking process is human cantered approach. According to design school the following are the five phases of design thinking.

1. Empathy of users
2. Define user needs, and their problems
3. Ideate for creating ideas for innovative solutions
4. Prototype to create solutions
5. Test the solutions

IV. SOCIAL DISTANCING SOLUTIONS

Many new innovations are developed by start-up companies to mitigate the risk of Covid-19 and maintain social distancing. A Belgium based Start-up Company Pozyx has developed to alert the employees when they are closed at a distance. By using Ultra Wire Brand Technology, it is possible to measure positing up to 10 cm accurate than blue tooth and Wi-Fi. It will heat map of the employees and their specific contact record. Fig2.Shows the image of the system developed by them (2)
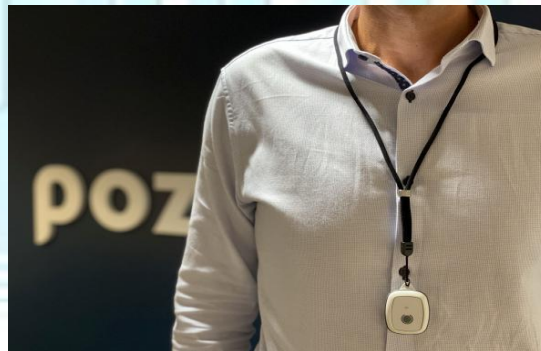

Fig2. Pozyx developed a product based on Ultra voilet Band Technology (2)

IR Cameras automate the detection of fever. It is difficult to measure temperature of each and individual persons to simply the system A German Based company called Optirs has developed a Infra-Red camera version of PI450i with an optical resolution of 388x288 pixels. It will be connected to a PIX connected software measure the surface temperature of person's face (2). Fig3.shows the working principle of IR Camera.
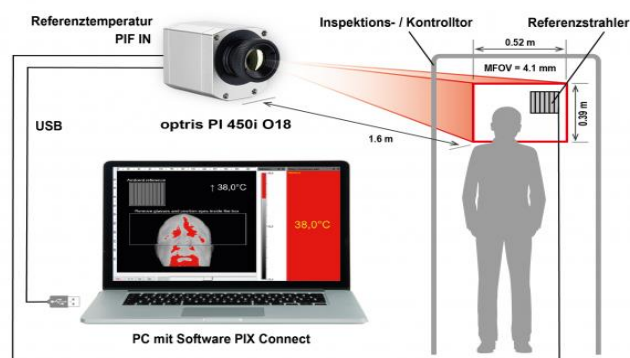
Fig3. By using IR Technology Surface Temperature Person can be measured

The above system can record the temperature of a people in a crowd or individual can be measured. PI450i Camera has thermal sensitivity of 40 mK

To keep the employees safe in warehouse Digi Key has developed an ultraviolet sanitation tunnel can able to sanitize 8000 people through intelligent conveyor system. In addition to sanitizing chemicals it also uses Ultraviolet Germicidal Irradiation (UVGI) technique to kill and deactivate microorganisms by destroying nucleus acid and disrupting their DNA (3). Fig 4.shows the working of sanitation tunnel.

Fig4. Tunnel can be used in Warehouse

A Gurugram Based start-up Pariband Solutions has developed a product called "**RAKSH**" a social distancing device. It is a standalone pager which can be worn on wrist or fixed to belt. 360 degrees proximity sensor will detect the similar device come within proximity and gives alarm to the user by a sound or a vibration or through LED display. It can used workers, students, and professionals. The company will give cloud-based solutions, data for contact tracing behaviour analysis to maintain social distance (4)

Fig5. Social Distancing Device

Burger King reopened restaurant in Germany a new innovation come to into their business to enforce social distancing. Burger king traditionally has given to paper crown their customers at counters. Now they have designed a cardboard crown to keep 6 feet by their customers. (5)

Fig6. Burger Kings restaurant in a Germany

In South Korea, a robot called Barista a Coffee making Robo can make 60 varieties of coffee to the customers. It will also transmit data to the devises to calculate the best route to deliver the coffee to the customer. The various examples show the social distancing practised in a park in Portugal. Hotel in a Netherlands and Hotel in a Thailand (Courtesy: Reuters, May 2020)

A. Marechal Carmona Park, Portugal

B. Quarantine Green House, Netherlands

C. Restaurant in Bangkok

D. A Pub Entrance in Japan

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E. A School in Belgium

F. A Super Market in Brussels, Belgium

Livi Industries, USA has developed a Virtual Queuing model to process the customer in School, Bank, Retail stores, and Or Driving Licence interview. The following are the salient features of the product in a College are described.

1. The student must register using any web enabled device
2. They wait virtually in campus
3. Student hailed thorough text
4. Arrives at assigned register

The advantages are
   a) Decreased perceived waiting time
   b) A Text based communication system away from the crowd
   c) It working as a Software as a Service
   d) Web based registration and scheduling
   e) Centralized media manager
   f) Optimize customer flow

V. CONCLUSION

Design thinking is an innovative approach to solve the real problems. The main moto is customer empathy and user experience. Covid-19 is pandemic disease ever person must maintain social distancing of 6 feet to minimize the risk of transmission of disease. Many innovative solutions are emerged to find the solutions of social distancing in schools, colleges, hotels, and offices. Covid-19 gives us an opportunity to create new inventions and solutions to engage customers.

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