



TRIOMOBIL
DIGITAL FACILITY SOLUTIONS

**Which Technologies Should Be Used
For a Safe Return to Work Environment During Pandemic Outbreak?**

“The New Normal” in Business World

Covid-19 outbreak has been affecting various industries all around the world and meanwhile as it still continues, normalization plans are being executed step by step as well. Companies are getting ready to get back to work, in order to start production again and revive the national economy. On the other hand, this period obliges new rules and standards in business world as well as in every aspect of life

“The operational and business continuity of companies will depend on how much and how fast they adapt to this change and this period”

The precautions, that will be taken in order to ensure employee and customer safety, are high priority for everybody during this “getting back to work” period. For companies, applying these new rules and standards for health and safety measures is as much important as defining them. The spread of the disease within the organization is a great danger. Hence, it is crucial to make sure that these rules and standards are being executed.

Even though measuring fever via thermal cameras seem to be a sufficient solution, the lack of quarantine decision and the possible physical contact between employees during the incubation period which lasts for 14 days, will cause the disease to spread rapidly. Especially when social distancing is being controlled, there is no room for human error.

At this point, technology and digitalization come to rescue. It is crucial for companies to measure and control social distance digitally and gather historical reports of physical contact

The precautions to be taken regarding the Social distance rule in the workplaces can be listed as follows:

- **Prevention:** To ensure the protection of social distance rule
- **Control:** Detecting and monitoring whether social distance rule is followed or not
- **Back-Trace:** Historical reporting and determining the employees whom physically contacted.

Considering the importance of the subject and risks, it is important to choose the best solution and the most reliable technology. With this purpose, R&D Engineers of Trio Mobil approached; thermal image processing, Back-Trace tracing via mobile application and IoT based technologies, and performed efficiency analysis for each, regarding digital social distancing control.

A. Image Processing Technologies via Cameras

Although image processing via cameras seem to be a proper method to control social distancing, it is not possible to gain efficient results with modern-day technologies. In most cases, it will not be possible to identify the people who are in close contact via Cameras. Modern-day facial recognition technologies can only identify people in close range and only if the image is clear and in high resolution. Thus, it is not possible to make such a successful identification in an industrial environment where people are considerably distant. In addition, considering employees will be wearing masks, even close-range identification attempts will not success. Therefore, camera-based image processing method does not provide a reliable solution to Back-Trace control and reporting which are the most critical issues.

Apart from that, the difficulties that might occur in using modern-day camera-based image processing technology can be listed as follows:

1. Blind Spots:

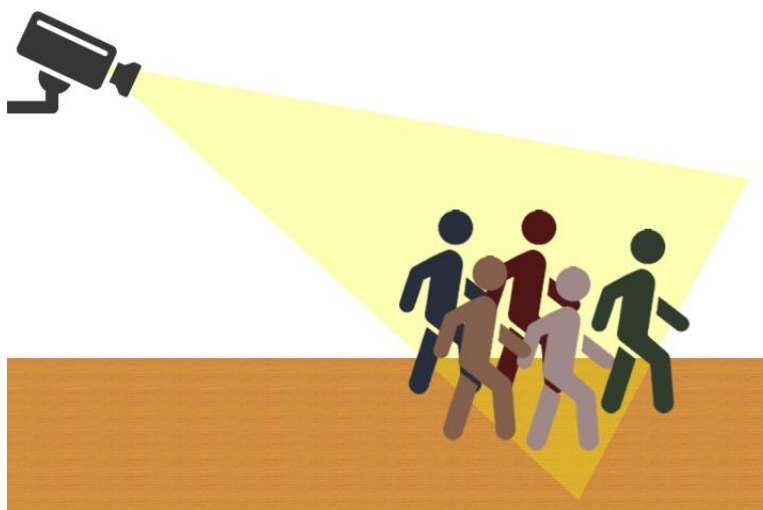
- Areas out of sight: Because these areas will be blind spots, the number of the cameras that should be implemented will increase. Behind objects, shelves, cabinets and vehicles: The number of cameras increase, especially in narrow and tight spaces.



- Blind spots due to crowd: A camera cannot detect a person who is behind another one.

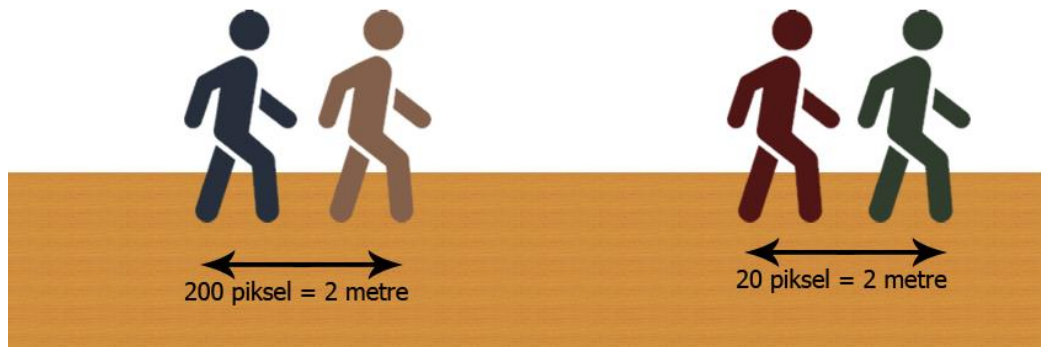
2. Installation Difficulties:

- Intersection of camera angle: In areas where multiple cameras are implemented, a person can be counted as more than one when displayed by multiple cameras at the same time
- Camera angle sensibility: Any millimetric movement of the camera, causes shifts in terms of meters. Therefore, precision in installation is necessary



3. Calibration:

In order to determine the distance between people accurately, it is necessary to calculate the correspondence of the pixels of the camera image and the meters in the real world. Without calibration distance detection is unreliable. Furthermore, even if the cameras will be calibrated, the process has to be done one by one for each camera with precision. Automatic calibration is not possible



B. Social Distancing Detection via Mobile Applications

Even though mobile applications seem to possess some proper functionality for detecting social distance outdoors, it is not an efficient method for Back-Trace. This method holds some crucial disadvantages for indoor usage.

1. Background Application Sleep Mode

When applications are not in use, they may continue running by switching to the background. When Back-Trace applications switch background, they must continue scanning Bluetooth signals around. Yet, operational systems might block scanning by restricting access of the Back-Trace application running background.

2. Lack of a Proper Method for Social Distancing Detection

It is highly probable that the application will receive all the signals in 15-20 meters range. This situation doesn't pose a problem nationwide, because it is sufficient enough to detect the people in the same environment with the help of WIFI signals received from houses. However, in factories and similar work places, where people are working close to each other, it is a necessity to use a special hardware, which holds the capability to detect distance around 2 meters with micro location support. When the distance is calculated from a range of 15-20 meters, the calculation will be incorrect, as all employees will occur in contact with each other direct or indirectly.

3. Employees Who Doesn't Have a Smartphone

Smartphone penetration is still not 100%, hence it will not be possible to include these employees to the system

C. Social Distancing Detection via IoT Technologies

With the help of IoT technologies it is possible to calculate and record the distance between employees located in/out doors constantly. The system runs based on distance calculation with the help of digital cards delivered to employees and without the necessity of any infrastructure. The system doesn't hold such disadvantages as blind spots or failed recognitions like Camera technologies. And because it is capable of running in various locations such as production areas, shuttles, dining areas, outdoor locations without any infrastructural necessities, it supports far more accurate quarantine process management. The data collected from the devices is processed through data analytics, which helps minimizing the risk. With the support of Trio Mobil IoT platform, a three staged and efficient process management is made possible via alarm management, prediction and reporting infrastructure:

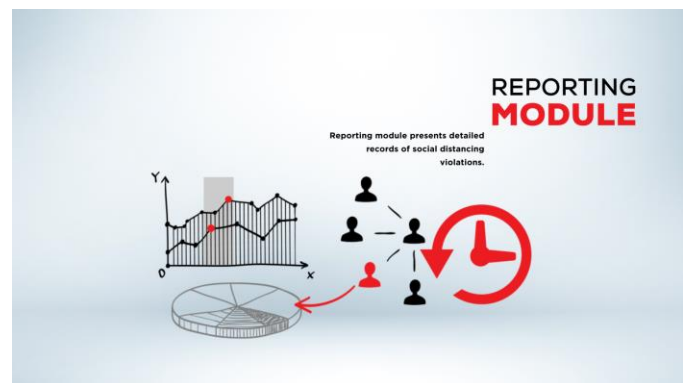
1. Controlling if the rules are being followed and notification in case of a breach



2. Current situation analysis



3. In case of infection, performing contamination predictions supported by historical physical contact data



In the light of findings above, it is clear that IoT technologies are the most ideal solution in social distancing detection. Considering the combination of advanced data analytics and online real-time tracking systems, it would be the best decision to benefit from IoT technologies for data driven quarantine management

