

COVID-19 Resiliency Improvement With Shift-Left Data Science and Artificial Intelligence Approach

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ABSTRACT

Objective: In this paper, we present a data science and artificial intelligence approach to effectively improve resiliency against COVID-19 at Micron Semi-conductor Malaysia. Speed to trace close contacts is crucial to control the spread of viruses. However, the contact tracing tool from an external vendor had the disadvantage of providing contact history for only a single user and first generation at a time, without critical worker information such as full name, department, position, and supervisor. An enhanced contact tracing tool drastically reducing the time by 144 times was developed and deployed, reducing the time from 3 days to 30 minutes for a real incident of 47 infected team members. The tool automates contact tracing all the way to third-generation contacts that need to be quarantined while linking worker information. By applying data analytics on the contact tracing tool data, impactful leading indicators that allowed identification of hotspot groups and identification of potential super spreaders in the manufacturing facility were provided. Complementing the enhanced contact tracing tool deployed, video analytics (VA) that monitored surveillance video footages for social distancing compliance were also deployed via the applications of deep learning and computer vision on the cloud infrastructure. By integrating the pre-trained you-only-look-once (YOLOv5) model and bird's eye perspective method, violations of social distancing were timely detected and tracked. **Conclusion:** Combined, these shift-left approaches enabled preemptive measures to minimize the potential impact on operations and were proven to be effective in assisting the overall effort to ensure workplace safety and business continuity.

Keywords: Automation, COVID-19, deep learning, video analytics.
