



COVID-19:

Social Distancing Technology Solutions

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Why Now?

As the world continues to grapple with the COVID-19 pandemic and seemingly endless related challenges, some governments are slowly easing lockdown measures, while urging citizens and businesses to remain cautious. For many organizations, even short-term delays in reopening can result in grave consequences, threatening their very existence, and at minimum, severely affecting the physical, mental and emotional health of their workforce. Ripple effects of these impacts will be felt for a very long time, both at individual and societal levels. However, the fact is, returning to – or rather building – a new “normal” reality brings up a multitude of issues that are yet to be resolved.

Following the return to work, the typical workplace will look very different. Employers are forced to find ways to ensure continuity of their business operations while protecting health and wellbeing of employees, maintaining safe physical distance and preventing possible outbreaks caused by the spread of the virus. Beyond securing sufficient PPE reserves, social distancing solutions were not thought of or prioritized before COVID-19, but are emerging as a necessity to help businesses transition back from remote work or pause modes, putting crucial safety measures in place and ensuring preparedness for potential subsequent waves of the pandemic.

Across the globe, technology companies are racing to build products and services to aid governments and many industries, such as manufacturing, service, retail, healthcare, and hospitality, with reopening safely and confidently for their customers and employees.

In addition to tracking, monitoring and encouraging social distancing, these solutions often offer additional features, such as contact tracing, insights on safety of the adjacent areas/specific locations, and educational components (i.e. how to practice social distancing safely).

The following summary captures an overview of various social distancing technologies available on the market today, their key features and examples of application.

Social Distancing Technologies

Based on technology standards, types of applications and modes of deployment, social distancing solutions cover a broad spectrum of options that can be used by individuals and organizations, depending on their unique needs and context. While for more basic settings (e.g. small businesses or offices), simple and fairly straight-forward partition solutions made of plastic or plexiglass suffice to maintain safe distance, other scenarios (such as manufacturing, service industries or retail) require more comprehensive solutions involving a variety of features.

Most available products and services can be segmented into those leveraging e-tokens, app-based, software-based, or device-based, as well as more complete suites of solutions. Furthermore, these solutions typically utilize combinations of technologies, including Bluetooth, geolocation trackers, radio waves, sensors, IoT connections, APIs, AI/deep learning/machine learning, speakers/microphones, and more.

Social Distancing Technologies

E-tokens

are leveraged as a queuing and information system to encourage social distancing and prevent overcrowding in public places and retail settings. These solutions facilitate alerts to customers to advise them on the best time to shop, when to pick up their orders, and more. The Delhi government in India deployed an e-token system to better organize liquor shopping, to ensure that the number of customers at local shops is maintained under a specific threshold. A similar solution was deployed in vegetable markets in Bombay.¹ These solutions help support local vendors, creating a safer environment for in-person store visits – as an alternative to online ordering via larger service providers.

App-based technologies

can be used on desktops, laptops, tablets and smartphones, helping to identify crowded locations and offer maps and solutions to users to support their social distancing efforts. Google and Apple announced a joint effort to enable the use of Bluetooth technology and create development tools, supporting governments and health agencies in their efforts to reduce the spread of COVID-19 and alerting individuals of potential exposure.

Several applications emerged leveraging the Google/Apple API,² including COVID SafePaths, CoEpi (Community Epidemiology in Action, focusing on transmissible diseases like COVID-19, colds and the flu), COVID Shield, Covid Safe (by University of Washington and Microsoft volunteers), COVID Trace, Zero, and others – tackling contact tracing, symptom reporting, facilitating safe social distancing efforts, exposure notification, and more.

Developed by the University of Memphis researchers, the mContain app leverages location and Bluetooth technologies in mobile devices to detect “proximity encounters with other app users”, also indicating crowding levels in public places and allowing users to share their COVID-19 test results, notifying others about exposure.³ Crowdless anonymizes user data while tracking mobile device movements, enabling location-specific data entry. Launched by Stanford University, the Covid Watch app emphasizes a strong privacy model, relying on “automatic decentralized contact tracing” using Bluetooth proximity networks.⁴ Sonarax’s Social Distance Keeper can precisely detect physical location leveraging sound technology, without dependency on the Internet or cellular connection.

Social Distancing Technologies

Software-based solutions

tap into AI, video monitoring and other complementary tools to determine whether social distancing practices are observed and measure crowding density, signalling when a particular setting is not deemed to be safe. [Voxel51](#) measures physical distances through advanced machine learning analysis, monitoring retail traffic and identifying when locations are busy, leveraging computer vision modelling and video feeds. Construction safety software provider [Smartvid.io](#) incorporated an AI interface to ensure that workers on job sites practice social distancing – serving as a “virtual safety inspector”.⁵

Device-based technologies

are largely represented by tools or wearables (e.g. smartwatches, wristbands or tags) that are often paired with apps or connected to IoT devices via Bluetooth or LTE. [The Virus Defended Distance Reminder](#) wristband uses sensors to gauge the need for proximity alerts, and sends a warning signal to users when the distance between them is less than six feet. Similar functionality is employed by [Halo](#) and [Tsingol](#) solutions. These technologies also implement contact tracing, allowing to determine which employees might require COVID-19 testing based on their interactions. Other wearables, such as [Ubudu Social Distancing Assistant](#), [Bump](#), [Triax Proximity Device](#) and [Pathfindr](#), offer discrete and non-disruptive ways to monitor social distancing through tags connected via Bluetooth or Ultra-Wide Band (Ubudu) technologies. In addition to a wearable device, [Bump](#) offers a customizable software and hardware system, supporting monitoring of social distancing as well as hand sanitizing practices.

More complex suites of solutions offer comprehensive measurement, monitoring and deep analytics of other aspects of work situations. [Pervasive Technologies](#) helps governments and businesses to enable and enhance risk mitigation efforts by utilizing thermal sensors and AI to detect, alert and report human body temperature, social grouping, proximity, and PPE detection. Smart city technologies' adoption accelerated by COVID-19 can help municipalities collect and monitor data on individuals via vast networks of partners solutions, sensors and IoT, while also measuring traffic, congestion, car occupancy, parking, pedestrian flow, and more.

Please request the Appendix for a more detailed list of solutions.

Deployment Considerations

Organizations considering the deployment of social distancing solutions are advised to conduct further comparative research based on the specific parameters of their workplace setting, monitoring requirements and desired outcomes. Most technology solutions are aiming to deliver on social distancing tracking and alerts, but additional features can also be applicable, particularly if there is interest in complementary capabilities, such as contact tracing, customized dashboards, predictive analytics, and more. Furthermore, auditing the solution(s) of interest for data privacy and security, safety, accuracy and reliability, as well as compliance with local regulations is highly recommended.

Implementing social distancing technologies in the workplace is poised to become a critical tool to help mitigate the risks associated with global pandemics, such as COVID-19. However, vigilance around data collection and personal information reporting must be observed to prevent any related threats. These solutions will be increasingly scrutinized for their privacy implications regardless of the model chosen. While we do not see any clear market leader on this front at the moment, our prediction is that further requirements will be put in place to demonstrate that appropriate policies and processes are followed to respect data privacy at all times.

Additional Sources

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2. Moss, Andy, et al. "Demonstrating 15 Contact Tracing and Other Tools Built to Mitigate the Impact of COVID-19." TechCrunch, TechCrunch, 5 June 2020, techcrunch.com/2020/06/05/demonstrating-15-contact-tracing-and-other-tools-built-to-mitigate-the-impact-of-covid-19/.
3. "New App for Personal Tracking of Social Distancing in the Memphis Area." NSF, NSF Public Affairs, 10 Apr. 2020, www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=300378&org=NSF&from=news.
4. Von Arx, Sydney, et al. Slowing the Spread of Infectious Diseases Using Crowdsourced Data. 2020, https://www.covid-watch.org/covid_watch_whitepaper.pdf.
5. Phillips, Zachary. "AI App Debuted to Track Jobsite Social Distancing Practices." Construction Dive, 1 Apr. 2020, www.constructiondive.com/news/ai-app-debuted-to-track-jobsite-social-distancing-practices/575305/.

Appendix

Solution	Company	Website	Location	Functions	Mechanics	Suggested Applications
mContain (App)	The MD2K Center of Excellence, University of Memphis	https://mcontain.md2k.org/	Memphis, USA	<ul style="list-style-type: none"> - Social distancing tracking (alerts) - Social crowding info - Early warnings about risk of infection 	GPS, Bluetooth	Developed for personal use
Covid Watch (App)	Stanford University, University of Waterloo (research team)	https://www.covid-watch.org/	Stanford and Waterloo, USA	<ul style="list-style-type: none"> - Contact tracing - Alerts about potential virus exposure - Supports voluntary reporting of positive test results 	GPS, Bluetooth	Developed for personal use
Crowdless (App)	lanterne.ai Social Enterprise	https://crowdlessapp.co/	UK	<ul style="list-style-type: none"> - Collects and provides data on crowdedness of locations to support with safe social distancing practices 	Mobile app, leveraging a combination of existing data sources and crowdsourced data	Developed for personal use
Social Distance Keeper (via Smartphone)	Sonarax	https://www.sonarax.com/	Haifa, Israel	<ul style="list-style-type: none"> - Contact tracking and tracing 	"Data over sound" via mobile phones, implement communication protocols via apps; signal-processing algorithms via software development kit (SDK) deployed across platforms and OS; 10x-per-second sampling. Can leverage speakers on other devices, such as cash registers, vending machines, tablets, laptops, etc.	Public, commercial, corporate environments (assumed)
LiveReach Media (Motion Analytics Platform + Media Player)	LiveReach Media	http://www.livereachmedia.com/	Sunnyvale, USA	<ul style="list-style-type: none"> - Social distance monitoring and notification - Digital signage to communicate to customers - Identify and protect at-risk groups such as the elderly - Email and text message alerts to staff 	Motion analytics platform/computer vision technology; media player; LTE/ WiFi/ethernet	Public, commercial, corporate environments (assumed)

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Voxel51 (Monitoring System & Physical Distancing Index)	Voxel51 Inc.	https://www.voxel51.com/fiftyone/	MI, USA	<ul style="list-style-type: none"> - Computer vision, deep learning models analyze density over time - PDI currently captured from major locations in several cities around the globe, including NYC, Miami, Las Vegas, London, Dublin and Prague - Retail application uses video feeds and computer vision modeling to monitor crowding over time 	AI, computer vision	Retail and similar settings requiring crowding monitoring
Smartvid.io (Monitoring Platform)	Smartvid.io	https://www.smartvid.io/	Cambridge, MA, USA	<ul style="list-style-type: none"> - Video data analysis to observe and track social distancing and PPE compliance - Reporting to reward proper practices and alert to mitigate risks - Determine risks and trends over time 	Video data monitoring via AI-powered dashboard and analytics. Integrations with integrations with Autodesk® BIM 360® Field and Docs, Box, Egnyte, Oracle Aconex, OxBlue, Procore, and StructionSite	Public, commercial, corporate environments (assumed)
GearUp (Samsung Galaxy Watch Active2)	Samsung	https://www.samsung.com/us/business/solutions/topics/wearables/social-distancing-management/	Seoul, South Korea	<ul style="list-style-type: none"> - Geofencing, messaging, social distancing management - Built-in heart rate, motion and activity sensors 	LTE or Bluetooth	Personal and organizational use. Public, commercial, corporate environments (assumed)
Virus Defended (Smart Wristband)	DAILY RFID Co.	www.rfid-in-china.com	Guangzhou, China	<ul style="list-style-type: none"> - Social distance monitoring (alerts) 	RFID (radio-frequency identification) tagging	Public, commercial, corporate environments (assumed)

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Proximity Trace (Wearable TraceTag Device)	TRIAX Technologies	https://www.triaxtec.com/	Norwalk, USA	<ul style="list-style-type: none"> - Social distance monitoring and tracking (alerts) - Contact tracing (recorded interactions) 	Cellular gateways; device-to-device and device-to-gateway signaling; no dependency on WIFI or internet; no Bluetooth, GPS, or offsite tracking	Well-suited for oil and gas facilities, utilities, construction, manufacturing and other industrial environments (can be affixed to a hard hat, or word on a lanyard)
PathFindr (Wearable Tag Device)	PathFindr	https://pathfindr.io/	Norwich, UK	<ul style="list-style-type: none"> - Social distance monitoring (alerts) 	Low-power ultra-wideband technology; 3.5GHz (radio TX frequency)	Public, commercial, corporate environments (assumed)
Halo (Wristband)	Proxxi	https://www.proxxi.co/	Vancouver, Canada	<ul style="list-style-type: none"> - Social distance monitoring (alerts) - Contact tracing (proximity logs, downloadable interaction data) 	Bluetooth wristband	Public, commercial, corporate environments (assumed)
The Social Distancer (Wearable)	Social Distancer Technologies Inc. (partnership with National Research Council)	https://gosocialdistancer.com/	Québec, Canada	<ul style="list-style-type: none"> - Social distancing (alerts) 	New technology (patent-pending); combination of sound, vibration and LEDs	Public, commercial, corporate environments are supported, including all industries, such as aerospace, defence, automotive and industrial production. Not for personal use.
Tsingoal (Wristband & Tag)	Tsingoal Technology	https://www.social-distancing-contact-tracing.com/	Beijing, China	<ul style="list-style-type: none"> - Social distancing (alerts) - Contact tracing (advanced solution) 	Ultra-wideband technology; wristband or tag, gateway and software (for contact tracing)	Public, commercial, corporate environments (assumed)

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Polte Proximity (Wearable & Analytics System)	Polte Corporation	https://www.polte.com/proximity/	TX, USA/ Cambridge, UK	<ul style="list-style-type: none"> - Social distancing (alerts) - Contact tracing - Identifying high-risk areas 	Cloud Location over Cellular (C-LoC) – 4G and 5G Mobile IoT networks	Indoor and outdoor; a variety of settings, including warehouses, manufacturing, construction, campuses, and others.
Bump (Personal Motion System)	Tharsus	https://www.bump-space.com/the-system	Northumb- erland, UK	<ul style="list-style-type: none"> - Social distancing (alerts) - Sanitising reminders - Identification of crowding "hot spots" via sensors - PPE tags support adjusted distancing guidelines - Personal dashboard to provide individual information to users 	Radio frequency technology; wearable, hub, charging stations, location beacons, PPE tags, individual data dashboards	Works across multiple spaces and floors; outdoors and indoors. Also supports product location intelligence, asset tracking and productivity insight.
Ubudu (Real Time Location System)	Ubudu	https://www.ubudu.com/	Paris, France (HQ)	<ul style="list-style-type: none"> - Social distancing (alerts) - Contact tracing and contamination auditing - Patient journey monitoring - Equipment tracking - Wayfinding, incl. avoiding contaminated areas - Operational flow analytics and auditing 	UWB, BLE, GPS, Lora, Sigfox, LTE technologies (tags and mobile devices, anchors and gateways, location engine, application engine)	Hospitals, industrial sites, restaurants, smart buildings. Current clients include McDonald's, Cathay Pacific, Musée du Louvre, and more.
Pervasive Technologies	Pervasive Technologies	https://pervasive-tech.com/covid-19-detection/	Barcelona, Spain	<ul style="list-style-type: none"> - Visualize and detect temperatures and PPE - Proximity tracking - Data reporting via a web browser and/or mobile application. - Alert messaging - email, SMS, integration with access control, and other enterprise system - Digital outputs to connect alarm systems 	Thermal equipment, software, cloud and AI application	Office buildings, schools, hospitals, warehouses, manufacturing areas, airports, railway stations, entries and exits, retail/shopping areas, food courts and restaurants.

Thank you



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