Screening Employees and Customers for COVID-19
Triangulating on the right approach for you and your organization

In today's pandemic-driven economy (and in any future state where you want your employees, customers and organization to avoid the pain associated with illnesses in the workplace) many of you are trying to figure out:
- How do I keep my employees and customers safe?
- How do I keep my organization free from liability?
- How do I maximize my organization's resiliency in the face of debilitating illnesses, including COVID-19?
- How reliable is any particular solution?
- How private is any particular solution?
- How expensive is any particular solution?
- How do I manage the various tradeoffs?

This article focuses on walking through many of the different parameters associated with these questions and the various categories of offerings available to you when doing your research or considering your options. Like every decision you make, each solution has its own advantages and disadvantages.

Were cost no factor in your decision, the "Gold Standard" would likely be to locate your business in the middle of a hospital ward and have the professionals, equipped with all of their protective gear and evaluative materials, screen each employee and customer and then let them pass into the inner sanctum of your newly relocated office in the depths of the hospital. There's little doubt of the expertise, the efficacy, and the safety of such a solution. Of course, it's also not very feasible and would likely be ridiculously expensive.

But, let's use this business-in-middle-of-hospital Gold Standard as our foil for comparison to other solutions -- where we'll use a scale of 1-10 (10 being "the best") to rate different aspects of the Gold Standard.

The Gold Standard helps us point out many of the solution parameters:
- **Safety**: are those who are *performing* the screening safe from getting the virus and are those *being screened* safe? In the Gold Standard, using a scale of 1-10, we can call both of them 10s because of the depth of medical expertise and the available tools in the hospital that enable true experts to screen effectively.
- **Liability**: is your organization relatively insulated from lawsuits (or other forms of liability) from employees and customers who are screened? Again, we can call this a 10 because you can righteously assert you have taken more than reasonable care of your employees and customers' health and well-being. (You've relocated to a hospital for cryin' out loud!)

- **Resiliency**: what percentage of your organization is likely to be out with a debilitating illness at any given time (costing you money, downtime, lost productivity, etc...)? If they're checked by a trained medical professional using the latest techniques and training one can assume, again, your organization will have *the least* illness-related absenteeism around. Again, gold-standard = 10.
- **Reliability**: how well can you trust the efficacy of *every* screening performed? One would hope that trained medical professionals would be hugely reliable, but we also know they're human, the best screeners may not always work at the times your employees and customers arrive and may get distracted and/or may not be as every-time-consistent as you'd want. Let's give the Gold Standard an 8 on reliability.
- **Availability:** related to reliability is availability -- how available is the solution to you 24 hours a day, 7 days a week? Assuming the hospital has an emergency room, it's highly available all the time (although the best screeners may not be around!). Again, a 10.
- **Privacy:** how private is the employee or customer's personal information and experience? How much information do you, as the employer and/or supplier, have within your control as it relates to individuals' health symptoms? On the one hand, the hospital staff doing your screening for you insulate you from having any data other than the fact that employees and customers who passed through the screen are "safe" and those who do not "need additional handling". So, 10 on the privacy scale there. However, the ***hospital staff*** performing the screening now know the details of the individuals being screened and, being human, may inadvertently (or knowingly) pass along private information about those they're screening. Let's call that a 7 -- so a "blended" score of 8.5.
- **Flow Rate:** how many employees, customers (or visitors) can be screened at any given time? How fast? How long is the line? Sadly, the hospital workers who are the moat to your new office can only screen so fast, they're (for the good ones at least!) very diligent and fastidious, they'll screen every person the same way as the last and, as a result, don't handle a huge crowd very well. We'll score the Gold Standard at a 1.
- **Employee & Customer Satisfaction:** How happy are your employees, customers and visitors with the screening method you've chosen? Do they want to come back? Or will they grudgingly come back? Or, maybe, they'll avoid your newly relocated business like the plague because it's a huge pain in the rear. Here, too, the Gold Standard likely doesn't score too well -- sure, your employees and customers feel safe, but the whole experience, day in and day out, is likely similar to getting a root canal. Score = 4? Maybe?
- **Expense**: last but not least, how much actual hard money does the solution cost? And, what's the duration of that cost? As if the amounts charged to you by the hospital to cover the costs of their expert labor, their protective equipment, their own liability insurance and tools & equipment weren't egregiously expensive, the fact that you signed a multi-year lease for precious square footage *inside a hospital* puts the expense into the stratosphere. The score here is off our 1-10 scale -- maybe a -2?

Clearly, aside from some one-in-a-million amazingly wealthy organization, the Gold Standard is not a practical solution (while still being an amazing solution to the problem at hand - for those few).

What are the other options?
- Hire your own medical professional on-site with their own protective equipment, tools, and liability insurance to conduct the screening.
- Hire a non-medical person on-site, equip them with protective equipment and a thermometer, and ask them to ask a few screening questions.
- Have your employees handle all of their own health screening
- Equip an existing frontline employee with protective equipment and a thermometer and have them ask the screening questions.
- Buy an automated thermal-only sensor-equipped scanning kiosk/device
- Buy an automated tablet that handles thermal screening and health-screening questions
- Buy a robot with thermal sensors and question-asking abilities.
- Do no screening at all.

We can collapse these options into four: have a human perform screening, have a kiosk/kiosk-like-device perform screening, have a robot perform screening or do nothing. Let's look at each one, cross-tabulating them against our solution criteria and score them.

The Case for Team Human

The beauty of humans doing the screening is that humans *can* be friendly, discrete, handle a large number of exceptions from the norm and if they're already employees, handle other duties when there isn't someone needing to be screened. The downside is humans can also get bored, distracted, and surly, don't like to work 24 by 7, can sometimes be indiscrete and definitely can't screen a large number of people quickly.

Score-wise (on average, across all human solutions):

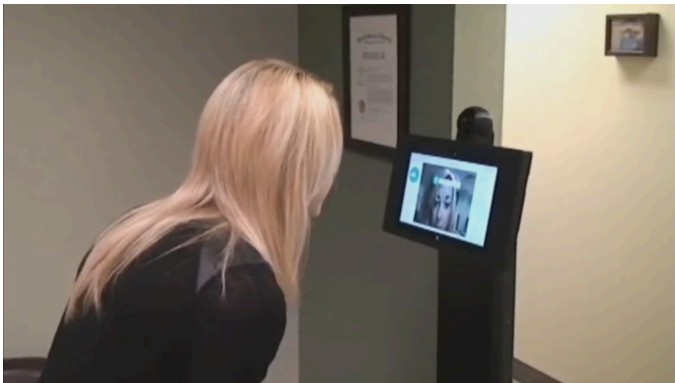|	Gold Standard	Team Human
Safety	10	5
Liability	10	5
Resilience	10	7
Reliability	8	6
Availability	10	5
Privacy	8	5
Flow*	1	3
Satisfaction*	4	7
Expense	0	2

The more professional the person employed the higher the score for Safety, Liability, Resiliency, and Privacy while also having a lower score for Availability (they're in short supply), Flow Rate (they like to be fastidious), Satisfaction (that fastidiousness probably gets annoying) and Expense (that expertise isn't cheap!). And, conversely, the less professional the person employed the opposite scoring trends. We scored Team Human a bit lower on Safety/Liability because many Team Human thermal solutions opt for cheaper foreign-made thermometers that have not been FDA Cleared. And, it's also lower on the safety scale because the human screener, themselves, is unnecessarily exposed in proximity to an unknown number of people who might themselves be ill.

From an expense perspective, even if using a low minimum wage human at $10/hour we're looking at $1,600 per month for a 8 hours x 5 days location and more for a 24 hours x 7 days location. If you think the requirement for illness triage will last only a few months, maybe the solution only costs you $5K. If you think you'll want it for a year or more you'll be spending a minimum of $18K and up. If you already have a frontline employee who can take on this additional task the cost is clearly a lot less, but you also face the risk of distraction, boredom, missed screenings entirely (coffee & restroom breaks), no screening occurring when that employee is out sick or on vacation (or consuming the time of a backup person), and last, but not least, the risk to that human screener of getting a disease itself!

The Case for Team Automation

Where automated kiosks & devices shine is in their reliability, availability and (for some) flow-rate(s). Because they are machines, they are capable of performing the same tasks 24 hours a day, 7 days a week without boredom, distraction, crankiness or any of the other emotions prone to plague humans asked to hold thermometers at the front door all day. Because they're more reliable and available, they also rate just a bit higher on the safety and liability scale too because they're consistent. They also do pretty well as far as privacy is concerned because the subject being screened is interacting privately and most kiosk solutions offer the ability to store (or not store) the screening information.

The downside for Team Kiosk is they're pretty boring and sterile, so they don't exactly scream "employees and customers will be thrilled with this tablet sitting in front of them". And, like most automation v. human comparisons, they really struggle with exception handling which also decreases the employee/customer satisfaction score.

Score-wise (on average, across all automation solutions):

	Gold Standard	Team Kiosk
Safety	10	6
Liability	10	6
Resilience	10	8
Reliability	8	7
Availability	10	10
Privacy	8	9
Flow*	1	3
Satisfaction*	4	5
Expense	0	7

Significant variations exist for Team Kiosk as well. Many thermal scanning devices are super-expensive (i.e. $30K and up) because they're highly accurate and designed for high-flow situations (mass transit centers, airports, etc…). Others are relatively inexpensive ($1-2K) because they employ less accurate thermal technology without blackbodies or reference devices so are less reliable in their abilities. A few of the mid-range ($3-5K) solutions employ far more accurate thermal sensing technology (thermal cameras) with reference heat sources that act as the known reference temperature. These reference devices are separate gizmos that are set up near the thermal kiosk so, in that sense, represent both an additional expense and an additional annoyance/maintenance point.

From an expense perspective, there's quite a range (as described above) -- from very cheap $1K tablets with thermometer-like inaccuracy to very sophisticated thermal imaging cameras with artificial intelligence built in to scan (temperatures only) hundreds of people per minute. The reason we scored Expense at a 7 is because there are good, accurate kiosk solutions in the $3-5K range, which beats the pants off the cost of employing a human for 6-18 months.

The Case for Team Robot

Where thermally equipped robots shine are, in many ways, all of the places automated kiosks shine **and** humans shine. Like automated kiosks they're reliable, they perform the same tasks over and over never getting cranky or bored. And, like humans, they're sociable and verbally interactive.

The downside for Team Robot is that they're a tad more expensive than automated solutions ($3K for Misty; $4K+ for Temi) and, like automated kiosks, they can't handle exceptions very well. Misty uses a reference device so is more accurate while suffering so they're much less proven across many different types of installations.

Score-wise:

	Gold Standard	Team Robot
Safety	10	6
Liability	10	7
Resilience	10	9
Reliability	8	7
Availability	10	8
Privacy	8	7
Flow*	1	5
Satisfaction*	4	7
Expense	0	6

Only two friendly robots exist on the market who will perform thermal screening: Misty and Temi. Misty scores higher on employee and customer satisfaction because she's built for human interaction with that Disney-learned personality while lower on availability (because she's propped up on a desk and not "available" in as many locations at once). Temi scores higher for its mobility.

From an expense perspective, we rated it one notch below Team Kiosk because you can get a good thermal-only kiosk for under $3K and both these robots, including software, are more than $3K.

The Case for Team Do Nothing

Where do nothing as an option shines is those situations where you have a high degree of trust in your employee base to do their own health screening and quarantining. And, you also have very little interaction with customers or visitors, and your employees are working remotely for the most part anyway. There's even the possibility that your work is outdoors with lots of distance between humans. Of course, "do nothing" beats that pants off every other solution from a cost and pain-in-the-butt perspective.

The downside of doing nothing is increased danger, increased liability, risk of substantial business downtime, and potential employee & customer dissatisfaction that your organization may not be taking their health and safety seriously.

Score-wise:

	Gold Standard	Do Nothing
Safety	10	2
Liability	10	2
Resilience	10	3
Reliability	8	0
Availability	10	10
Privacy	8	10
Flow*	1	10
Satisfaction*	4	3
Expense	0	10

As noted above, on the expense side it doesn't get any better: $0. Score = 10.

Putting It All Into a Table

Let's look at each of these five solutions (not including some of the variations described above) into a concise, color-coded scoring table so you can quickly pick out which one might be best for you depending on which criteria are the most important.

	Gold Standard	Team Human	Team Kiosk	Team Robot	Do Nothing
Safety	10	5	6	6	2
Liability	10	5	6	7	2
Resilience	10	7	8	9	3
Reliability	8	6	7	7	0
Availability	10	5	10	8	10
Privacy	8	5	9	7	10
Flow*	1	3	3	5	10
Satisfaction*	4	7	5	7	3
Expense	0	2	7	6	10

Conclusion

Each thermal sensing and health screening solution is "just right" for some organizations while not being optimal for others.

- Team Human shines for organizations that already have a human employed at a point of entry and who believe the need for a solution will be quite short, as the costs are low and the convenience of asking a current employee to handle the chore is straightforward.

- Team Kiosk shines for organizations that have a high rate of traffic flow, who don't value employee/customer interface(s) highly and who believe the pandemic will last quite a long time. This solution is optimal from a cost perspective.

- Team Robot shines for organizations who place a high priority on customer/employee satisfaction and overall safety because it maintains the physical separation of machine and human while offering a much more pleasant health screening experience.

- The Gold Standard shines for that rare, one-in-a-million organization that has the money to hunker down deep in the depths of the hospital (and the political capital to insert themselves into the hospital!)

- And, Do Nothing shines for those organizations who are entirely remote, outdoors, live in a very low-case-load environment or have a very small and trustworthy workforce.

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