NO-TOUCH SUPPLY CHAIN: INCREASE FOOD AND HUMAN SAFETY WITH AI

### Content

Impact of COVID-19 on the food supply chain

Required transformation to embrace the new normal

How Al can help you build a "notouch" plan and elevate safety standards





Partner of the Year

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## THE IMPACT OF COVID-19

#### **Context setting**

In a global enterprise before the current pandemic, it was common to use phrases like "low touch" or "no-touch" to mainly signify improvement in labor efficiencies, and in few cases signify the improvements in automation for human safety.

With the COVID-19 situation the terms no-touch, touch-free, or reduced-touch have a much higher significance given the two major crises it has caused:

- Providing healthcare services which needs a lot of touch
- Food supply chains involving high human touch. With the possibility of the virus being on any surface at any time, and even if one person in a building is affected, this increases the alarm for the enterprise at an exponential level.

In the last few weeks alone, multiple US food manufacturing plants, have been shut due to multiple food safety concerns. These concerns were raised as soon as employees started to positive for COVID-19.

As the food moves from farm to plate, we are now in a crisis that needs to be solved efficiently and at scale while keeping the costs at a reasonable level. Therefore, we need to come up with innovative ways to overcome these challenges.

We believe companies will need to revise people engagement with processes, and identify new ways to reduce touch across the different stages of supply chains.





## EMBRACING THE NEW NORMAL WITH INNOVATIONS

#### **Business Insights:**

WHO has laid out detailed guidelines on how to handle food while taking care of the food supply chain workers across all stages, from raw material and manufacturing to delivery and serving at the final location.

Additionally, the WHO addressed and compiled guidelines to increase the safety of the workers - especially where there is a necessity to touch the product.

Pluto7 works with various food processing,

CPG and FMCG companies where manufacturing and distribution of food is at the core of their business.

In these businesses, there are five common examples of interactions that exposes a food worker in a food processing plant:

• Transporting the meat or produce from the farm to the manufacturing plant



- Executing quality inspections at different stages of the assembly line
- Packaging and moving boxes into trucks
- Receiving orders at the destination
- Unpacking the meat/food at the final location.

Enterprises are now accountable to ensure that these interactions are safe while maintaining an appropriate social distancing with less touch. All of this has led to a need for a rapid and agile innovation that can be operationalized to keep business continuously running and avoid disruptions.

Artificial intelligence, which augments human ability to inspect and make decisions at each of those steps, shows promising signs to help reduce touch. Let us get a glimpse of it in the rest of the paper.







## HOW ARTIFICIAL INTELLIGENCE CAN HELP YOU REDUCE TOUCH

An oversimplified view of artificial intelligence can be seen as a replacement of various senses such as vision, sound, and touch. In some cases that allow AI to make decisions that would otherwise normally require a human to take action with a touch.

For example, detecting a defective package requires a visual inspection of AI to identify if the package of food is damaged or not in the logistics stage when unloading a box from the truck.

In this case, a simple camera which captures the image and run it against Auto ML can make the decision and tell if the carton is damaged with no-touch. Al technologies when applied to human safety involve many aspects where every need to touch can be assessed. Reducing people's movement alone on a manufacturing floor reduces the chances of a human touch.

In a manufacturing floor AI can be applied when a series of tasks are broken down such as:

- Inspecting the color of food
- Inspecting the quality of raw material
- Analyzing if people are wearing masks or not
- Analyzing if the person used a hand sanitizer or not using video intelligence
- Analyzing if the people around are working in close proximity and if the density is high
- Analyzing if there's a dangerous liquid spill and the list and the possibilities can go on.



The technology to do all of this is proven and is readily available. However the application of the technology involves enterprises stepping up to experiment and innovate. At the same time, enterprises should analyze their business processes and evaluate if their teams are ready to adopt AI recommendations effectively.

Al on Google Cloud has been leveraged by Pluto 7 in various real world scenarios with Fortune 500 companies, from beverage manufacturers and food distributors to consumer packaged goods, supply chain, and more.

In a motorcycle manufacturing plan, Vision Al has been leveraged to identify a SKU among thousands of products, reducing the need for humans to be present detection. On the other hand, multiple machine learning models has been trained to detect and predict filters replacement in a product line. This technology has reduced the need for human labor participation by 40%, saving tens of millions of dollars.

To see tangible results it is important to not look at technology as an independent component but rather as a part of your business problem discussion. We believe most innovation should take 45 days from ideation to sample results with Ai on Google Cloud.

We have seen these technologies and innovation work in many enterprises repeatedly. Fail fast is the key given the business continuity challenges that exist right now for this industry and many more.

Here is a reference solution architecture built using Google Cloud. This solution (Logistics ML by Pluto7) is a solution developed to solve some of these problems in a real world scenario:



Remote Devices

Cloud IoT Core

Cloud Data Services





A prototype like this takes less than 4 weeks with 2 people to prove the concept and then later put on a production roll out. Al innovations on cloud take much less time than a traditional on-premise capabilities and also some of the needs cannot be addressed through traditional on-premise capabilities given the amount of training that's needed for the AI models to be efficient.

In the automobile industry, AI has been leveraged to improve their manufacturing process for a few years now given the scale and the kind of risk their employees carry during manufacturing heavy equipment like automobiles.

### DRIVE AGILE INNOVATION

To drive agile innovation, it is recommended to first understand the process and break down the process steps into individual tasks. The next step will be to assess the labor involvement, labor exposure, and labor interaction that is needed to achieve the task. This will give you a risk factor related to the human touch while conducting the task and human interaction.

Assessing risk will help you judge the possibility of innovating with new technologies. AI maximizes the power of vision and video intelligence to reduce the number of touches, increasing your workers and plant safety.

The transformation AI ignites across food supply chains has to be considered as a journey and not just as a set of point solutions.

Imagine a typical scenario in a food manufacturing process, where a lot of people are standing in less than 6-ft proximity, and inspecting produce or food on a conveyor belt.

The risk of exposure with this COVID-19 outbreak is very high now. If you execute a food safety inspection where humans are involved in today's world, workers might be watching the food closely. However, the majority of the time they are only watching and just only a few times they have to touch the food.

In this specific example, they are just standing and observing so this process doesn't necessarily give the best efficiency of human time, plus it increases the risk of contamination and exposure to the virus. Instead, if you leverage AI and apply the concept that humans will only go look at the fruit on the conveyor belt when there is a defect identified by the AI system, you are reducing the human touch in a more efficient way.



Use cases like this become a good candidate for innovation. You do not need very advanced and complex use cases to achieve good business results. In fact many times it is the small use cases that bring the best transformation and innovation.

Everybody in the organization, from the team innovating and the team approving to the team adopting, all need to be on the same page when it comes to implementing new technologies successfully. Based on our experiences, we see incredible results when the recommendations are easily explainable and ackno.wledged by everyone As a best practice or industry observation, here are a few advices to enterprises who are apprehensive of these technologies

- The effort required to experiment with this technology is much lesser than it looks.
- Don't get deep into perfecting with ML models early on.
- When planned well, the skill sets that are needed to acquire and train are less complicated than what appears.







# CONCLUSION

- Define your supply chain tasks as it relates to human safety metrics through careful analysis of the way you run your business and how your employees interact with the machinery equipment and/or with other people. It is important to define the time, cost and number of touches per task whenever possible.
- Define a clear baseline of what your safety levels are and be practical by defining at a specific job task level to maintain the safety standards for COVID-19. Management is now accountable to not just follow safety standards from the past, but to rapidly understand new standards as they evolve for COVID-19.
- Conduct short studies that clearly document where a physical touch is involved when performing a job task across the enterprise supply chain. This includes but not limited to lifting cartons, printing labels, scanning barcodes, visual inspection of products during packing, feeding it into the supply chain or manufacturing machinery at different stages. Leverage the study not just to drive safety but also to see if you can drive better automations and efficiencies in your supply chain and manufacturing process.
- Get a clear understanding of how AI works in practical scenarios and talk to real experts who are solving this problem in FMCG, CPG and other food processing and distribution enterprises.
- Map key job tasks that involve significant human exposure for physical touch to a technology capability within AI that can act as a substitute. E.g. Video Intelligence, Vision AI. In addition, it is important to understand how the decisions humans made through physical interaction and visual inspections can be replaced with AI for better accuracy with higher safety and hopefully with lower cost. E.g. Logistics ML solution by Pluto7 reduces human touch of cartons when identifying damage and allows the user to scan documents without touching the paper for the most part.



- Drive agile innovation efforts to prove this out in real world scenario in 45 days or less. From our experience anything that takes more than 45 days loses attention for wider adoption. Cloud and current technologies allow you to rapidly overcome the traditional system limitations.
- Cultural readiness and process readiness will be the next roadblocks which you will have to face after the technology is proven. Processes will need to be changed and people trained to accomplish the final KPI or goals set at the beginning of the AI experimentation.

#### Reference:

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