

RETAIL STORE INDUSTRIAL SUPPLY SALES DURING COVID-19 PANDEMIC

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ABSTRACT

Covid-19 altered operations around the world, affecting buy costs and delivery times. For the Santa Clara outlet of Tritan Stores in Silicon Valley, a store dedicated to industrial supply sales, the warning lights turned on in January 2020. Consumption of masks, overalls and gloves skyrocketed. From the beginning of the pandemic to the present date, the branch continues working to satisfy customer needs, especially for the health and government sectors. Before the pandemic, the store worked with open doors and self-service. Now the sales agents absorbed those tasks and customers experience involves increased waiting time. This article presents five essential points that retail stores need to evaluate, to insure a safer and dynamic environment for employees and customers during the pandemic. We use sales data extracted from financial systems as a reference, to identify sales patterns, customer type and product's rotation. We conduct a motion study which allowed us to identify one bottleneck and two risks. The goal of this research is to set a precedent on how to manage activities of retail stores during pandemics. The new reality changes the store's vision. "And change is the only constant" Heraclitus 500 B.C.

JEL: I150, L810

KEYWORDS: Development, Disease, Economic Growth, Factor Productivity, Health, Human Capital, Human Development, Productivity, E-Commerce, Logistics, Online Shopping, Retail, Salespeople, Shopping Center, Standardized Work

INTRODUCTION

Supported by global sourcing, quality and logistics operations, Tritan stores (a large retail chain), is a local source for a spectrum of industrial supply and products. Products include Original Equipment Manufacturer (OEM) equipment and Material Repair and Operation (MRO) equipment. Fasteners, abrasives, pneumatic, electrical, cutting tools, welding, safety, adhesives, and office supplies are products offered by the company. Fasteners (bolts, screws, nuts, flat washers, among others) are the primary commodity sold by the company. Products coming from different sources around the world are stored in one of the thirteen hubs (central warehouse) and are distributed to each store every day through commercial routes. The business strategy is to monopolize industrial products sales with a single seller generating significant cost saving. This strategy allows customers to simplify the generation of purchase orders, entry of invoices, receptions, and payments. The company offers over the counter sales, vending machines, customer's on-site store and e-commerce offerings. This article analyzed face-to-face sales with pick-up at store. Specifically, we examine the risk of COVID-19 contagion that exists for the interaction of employees with the customers.

To identify how COVID-19 affected the store's operation, a data report was extracted from the sales software Store Solution Desktop and the company's Enterprise Resource Planning (ERP). The information analyzed covers the period January to October 2020. In previous years, sales remained

stable, which allowed the company to estimate at the beginning of the year the volumes of goods that would be sold in coming period. However, under the pandemic sales have behaved differently than the company's prediction. In January 2020, an unusual peak was produced by a high demand for PPE (Personal Protective Equipment). This demand aligned with confirmation of the first case registered in the US. Figure 1 shows that after January, health restrictions started to impact the surrounding business including through their sales performance.

Figure 1: Sales Performance, Year 2020 (Month 1-10)

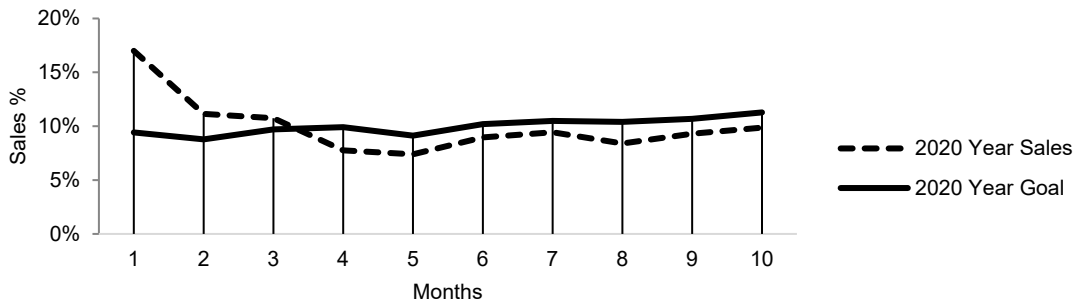


Figure 1 shows the behavior of the first 10 months of year 2020. In January, an unusual peak was produced by a high demand in PPE (Personal Protective Equipment), after March the sales started to stabilize but the store did not reach its yearly goal. The sales agents reported less visitors, this means less sales and their suspicious it was confirmed on this graphic where the sales are below the year goal.

Sales information was categorized in two type of transactions: Delivery orders occur at customer location and order pick-up occur at store’s counter’s store. According to the data the 62% of the transactions in 2020 came from pick-up operation and 38% from delivery. The goal of this paper is to demonstrate how to evaluate and manage the activity of a retail store during pandemic times to guarantee a safer pick-up order process. A second goal is to identify improvements for safer face-to-face business processes. We identify contagion risk and how to reduce sales’ time and improve employee productivity during the pandemic. This paper is organized as follows: The next section examines the related literature and develops the scope of this evaluation study based on five key points: Physical space, human capital, standardized work, Information and Communication Technology Tools (ICT) and communication with the customer. We then describe our data, methodology and discuss the results of our change proposal. The final section concludes the paper.

LITERATURE REVIEW

“In December 2019, a new coronavirus (SARS-CoV-2) emerged, sparking an epidemic of acute respiratory syndrome (COVID19) in humans, centred in Wuhan, China. Within three months, the virus had spread to more than 118,000 cases and caused 4,291 deaths in 114 countries, leading the World Health Organization to declare a global pandemic”, Bavel, J. J. V., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Willer, R. (2020). “The world is globally connected, in terms of the movement of people, goods, and food, while even within close knit communities”, Watkins, J. (2020). Globalization is the ideal condition for the virus to spread. David M. Morens, Gregory K. Folkers, and Anthony S. Fauci (2009) demonstrated that “The dynamics of the disease (pandemic) are significantly impacted by the degree of trade openness.” Over 100 years ago, Science magazine published a paper on lessons from the Spanish Flu pandemic. The paper argued that three main factors stand in the way of prevention: People do not appreciate the risks they run, it goes against human nature for people to shut themselves up in rigid isolation as a means of protecting others, and people often unconsciously act as a continuing danger to themselves and others. Bavel, J. J. V., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Willer, R. (2020). The most important reason for raising awareness regarding the measures is to avoid the spread because the speed of virus

contagion is faster than the care capacity of health emergency (hospitals, doctors, respirators, among others), the industrial capacity (protective equipment, drugs and supplies) or for handling the massive number of dead bodies. Osterholm, M. T. (2005) said “Planning for a pandemic must be on the agenda of every public health agency, school, board, manufacturing plant, investment firm, mortuary, state legislature, and food distributor”. A broad socioeconomic development plan including sector by sector plans and an ecosystem that encourages entrepreneurship is also needed so that those with robust and sustainable business models can flourish. Countries around the world imposed a number of protective measures to contain the exponentially increasing spread. This includes social distancing, avoiding unnecessary travel, and a ban on congregations. Maria Nicolaa, Zaid Alsafib, Catrin Sohrabic, Ahmed Kerwand, Ahmed Al-Jabird, Christos Iosifidisc, Maliha Aghae, Riaz Agha (2020).

The global economy is close to collapse, and people and their employees are the key to avoiding it, so we must start planning for an escalation in our response to the economy and its relationship to coronavirus infections. Physical space, human capital, standardized work, Information and Communication Technology tools (ICT) and communication with the customer are factors that can support the company in develop procedures that ensure buying and selling operations are carried out in a safe environment. We describe a concrete example in a retail store, but the evaluation can be done in all types of businesses and sectors. The physical space is the first key point studied, because it alters human relationships and the way we interact in supply centers (Ana Zazo-Moratalla and Alberto Álvarez-Agea, 2020). For Iglesias, M. C. (2020) “The physical space where the activities take place, the number of workers or the number of visits that arrive daily, among other aspects, must be considered. The frequency with which disinfection are carry out in each workspace, installing hydrogel dispensers in common spaces or proposing contactless access are some measures recommended by experts”.

“Social distancing, self-isolation and travel restrictions have led to a reduced workforce across all economic sectors and caused many jobs to be lost” Maria Nicolaa, Zaid Alsafib, Catrin Sohrabic, Ahmed Kerwand, Ahmed Al-Jabird, Christos Iosifidisc, Maliha Aghae, Riaz Agha (2020). The impacts on human capital is our second point of interest. Companies should impose stronger controls, vigorous measures, and COVID-19 prevention campaigns, that allows employees to be aware of how to support isolation of the virus and prevent it from spreading in a social and work culture (González, , 2020. “According to the Federal Emergency Management Agency (FEMA), more than 40% of businesses never reopen after a disaster, and for those that open again, only 29% were still working after two years”. Bahr, N. (2020).

Companies most affected by the economic and social crisis of COVID-19 imposed cuts in their workforce, in working hours and salaries for their employees. However, large distributors find themselves with a need for staff (Especial Directivos, 2020). Regardless of the situation you face with the workforce in your company, it is mandatory to have standardized work instructions to help employees with decisions. This third key point will support firm efforts to define “the safest and most efficient method to do the work that meets the needed quality” (Martin, & Bell, 2011). Within the company, the various functional departments must collaborate closely to maximize the logistics performance of the company. The company must also integrate its logistics system with those of its suppliers and customers to maximize the performance of the entire distribution system (Ballou, 2004).

Information and Communication Technology tools (ICT) are the fourth key point considered in the strategy. New business model trends are conducted through wireless networks, Web 2.0, Artificial Intelligence (AI), business intelligence application and technologies for big data analysis, (Zoroja, Klopota, & Stjepić, 2020). All physical goods, people and material flows are triggered and paralleled by ICT. The warehouse and supply chain process is kept moving by communication and the supply of information, Stuart Emmett (2005). ICT are responsible for transparent communication and quick

decision-making, based on data that allows the company to have an agile mind-set and speed up the changes. Real time information and a lean process allows companies to share reliable information to the customers improving the communication in both sides.

The timing and quality of information enables decision-making. Good information enables good decisions to be made (Emmett, 2005). ERP (Enterprise Resource Planning) is a computer-based tool capable of unifying various business processes and structuring the information into an advanced data structure entity (Xulu & Suknunan, 2020). ERP allows the company to optimizing processes and resources, which affects the optimization and efficiency of management itself and the relationship with customers especially if the company has CRM (Customer Relationship Management). From this literature the last key point relates to communication with the customer. Retail stores play an important role to captivate digitized customers, to gain their trust and loyalty, and to anticipate changes in demand (Directivos, 2020). Buying habits are not just one-channel. Online and on-site buying are used interchangeably by consumers. Customers can get information and compare it regardless of whether they make the purchase in another channel. Effective communication is important to promote customer's loyalty and is vital to company survival. In the current environment, companies are personalizing relationships with their customers to achieve competitive advantages, (Garrido, & Padilla, 2012). In particular, service companies seek to set up long-term relationships with customers. From this need came CRM, defined by the authors Binsar Kristian & Panjaitan, (2014). Like "the process of building and maintain profitable customer relationships by providing products that are valuable to consumers and create satisfied customers" aimed at their retention and loyalty. "While certain trends have been on the upswing for quite some time, our research shows the pandemic has sharpened consumers' need for transparency, sustainability and convenience" (Barr ,2020).

DATA AND METHODOLOGY

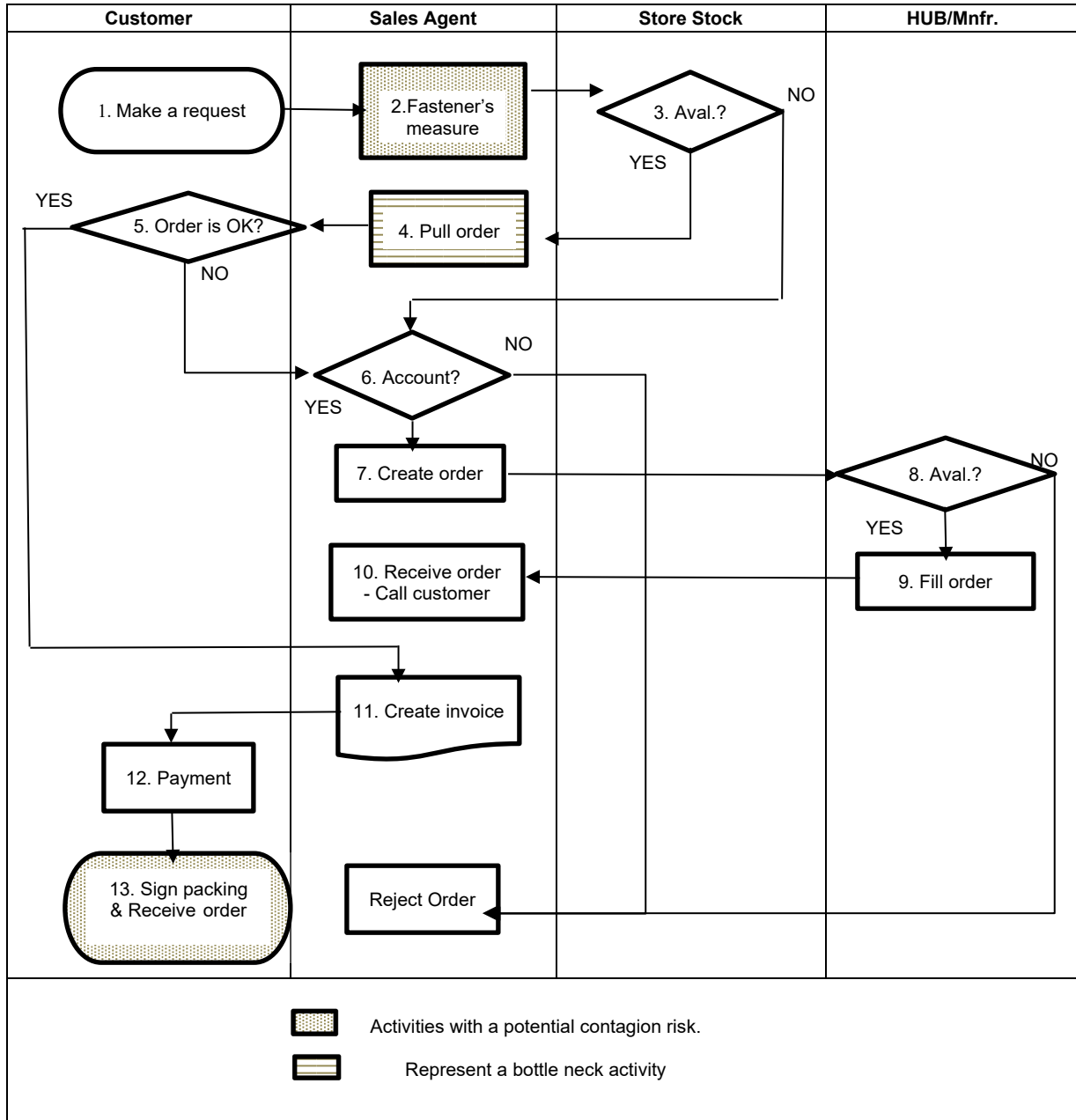
The research method here is exploratory, using direct observation and analysis of primary sources which include data collected from the company's sales information. Time measurements were conducted with the sales agents. The structure of investigation is to analyze sales patterns, identify the problems that affect pick-up orders and propose improvement solutions. Data shows that 62% of transactions in 2020 came from pick-up operations while 38% came from delivery. The pick-up operation is sub-divided into two categories: on account sales represent 58% of the total and cash customers represent the remaining 42%. Customers, with accounts, are familiar with the materials and makes and place request in advance by phone or directly at the store. They typically buy in bulk quantities since their jobs are related to big projects. Once the sales agent receives the customer's request, he reviews availability in the store stock. If the material is not available it takes one to five days to be received, depending on the relevant hubs (central warehouse) location. If the material is coming from a manufacturer or distributor, the window for delivery depends on their stocks, production time and location.

Once the material is ready for pick-up, the customer receives a notification from the store to pick up the order at counter. Depending on the payment terms negotiated with the customer, invoices can be closed daily or through a final statement by week, bi-weekly or at the end of month. Customers without an account usually come to the store looking for products in convenient quantities (5 pieces per bag). They rarely buy bulky quantities. The sale is closed immediately, since they pay by credit card. If the material is not available at the store, the customer looks for other supply options with immediate availability since the store does not place orders for this type of customer.

Both types of customers (with and without account) require technical assistance with fasteners to get the diameter, length, pitch and steel grade type (fastener's measurement). They also sign a packing

slip during payment. Figure 2 shows the process flow. In the sale’s order steps, the fastener’s measure and packing slip signature (highlighted figures) represent a daily risk of contagion, since the operation require face to face and contact interaction.

Figure 2: Current Sales Process Flow



This figure shows the current sales order process at the store face-to-face. The fastener measure is a potential contagion risk, since the sales agent needs to get the technical specification to sell the product. The wait time starts from step 4., when the employee needs to do a physical inspection to review availability or to pull the order from stock. for filling the order, the sales agent needs to walk back and forth several times to complete this step.

For the standardized work observation, we obtained a sample (n) of 63 time-readings, to identify the average time to serve pick-up customers. For the calculation, we used a confidence coefficient of 90%, a Z α value of 1.645, and a maximum accepted estimation error of 10% (e). The store reported

4,418 sales transactions in the last ten months of 2020 (N), of which the 62% (p) represent the pick-up transactions with 2,379 operations and the 38% (q) represent the delivery with 1679 transactions. This sample size will be used to take build the standardized time’s readings during the pick-up process (face-to-face sales) as shown in Equation 1.

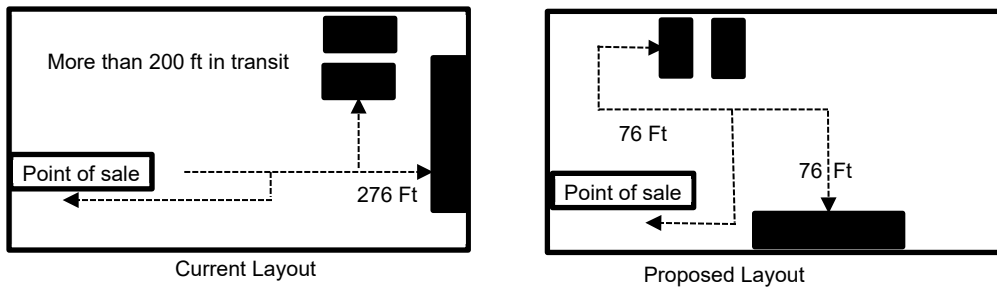
$$n = \frac{N * Z\alpha^2 * p * q}{e^2 * (N - 1) + Z\alpha^2 * p * q} \tag{1}$$

where N represent the population size or universe, Zα value is the statistical parameter that depends on the confidence level and the maximum accepted estimation error. The p represents the probability of success, while the q represents the probability of failure (1-p) and finally the n like the sample size.

RESULTS AND DISCUSSIONS

For the physical space evaluation, we considered the layout space of 5,757 square foot (121 x 47.58 ft), which is perfect for the current six employees. According to the County Health Officer’s rules regarding capacity, the risk of COVID-19 transmission increases when there is a high density of people present at a facility. To reduce this risk, the County Health Officer established that the retail store can open with 20% of their capacity. Before the pandemic, the store worked with open doors for all customers with self-service, but with the health crisis, the sales manager restricted access and limited service to one customer in the store with the sales agents responsible for taking the customer’s order and filling it. The original layout was designed to get the customer’s visual attention but now caused a bottle neck since high rotation products are located in the back of the store. We suggested reorganizing the store to place high rotation products closer to the point of sale. This process would reduce transit times as showed in Figure 3.

Figure 3: Current Layout vs the Proposed Layout



This figure shows the floor layout. The black rectangles represent material with high consumption that were placed more than 268 ft from the from point of sale. With the new layout proposal, transits are decreased to a distance of 76 ft.

Several times there were two customers inside the lobby store due to climate conditions (cold, hot, rain) which is fine if six feet social distancing rules are respected. The Company’s guidelines promote COVID-19 disinfection protocols, but employees do not feel the need to follow them even if the store does not have a janitorial service. Restrooms were available to customers, but workplace break areas did not have restrictions. Advertisements promoting the use of face masks, social distancing and a maximum capacity in the store were displayed. We observed employee commitment to sales and distribution of materials but not to maintaining health conditions. The manager shared N-95 mask and gloves with the employees and were always made available to the employees. But even if the company’s guidelines promoted COVID-19 prevention, a behavior of concern was observed in the manager and as a result in its employees who generated a false confidence. They decided not to wear a mask unless a customer was inside the store. Sometimes they overlooked wearing a mask even

though the customer was not wearing it either.

For the standardized work (pick-up process observation), with a sample (n) of 63 time-readings, we obtain the average time per sale (pick-up). Five main steps were identified: 1. Customer request (the customer present a material requirement), 2. Fastener measurement (to get the technical specifications: diameter, length, pitch and steel grade type), 3. Fill order (employees visually check availability for every sale and cross the store to fill the order), 4. Validation (customer confirms the order, changes the product or adds a complement), 5. Payment and order reception (the customer signs a packing slip to conclude the sale operation).

The results in Table 1 confirm the layout is not friendly with the new operation under Covid-19. Time motion analysis shows that pick-up customers usually buy two products per visit. Some 80% of the sales are related to bolts with a small presentation (5-10 pieces per package). However, these materials were located around 200 feet from the point of sale, leading employee to cross this distance to acquire and return the product for each sale. The main problem is if the customer changes the specification, size, material or adds a complement to the product requiring additional transits. The proposed new layout places the highest sales products close to the point of sale. The results show an average of 6 minutes per sale based on the original layout. This time can be reduced significantly with the proposed.

COVID-19 contagion risks were identified in steps 2 and 5 (Fastener’s measurement and payment). During fastener measurement, the sales agent needs to interact face-to-face with the customer and take the customer’s samples to get the technical specification. If the sale agent has another customer waiting to be attended, he does not have time to disinfect their hands and the area for the next customer. The second risk occurs during the payment when the customer uses the pen in the bank terminal to sign the packing slip. This pen is not disinfected between customers.

Table 1: Average Consolidated Time / Sale Operation (Pick up)

Activity	Average Time	Observation
Customer makes a request	00:26.442	
Fastener’s measure	01:45.820	Risky
Fill order (Transits)	03:00.237	Transit time =Bottleneck
Validation	01:17.563	
Payment + signature packing slip and pick-up order	01:20.825	Risky
Total time (min)	06:42.608	
Total time (hr.)	0.11	
# of type products	2.14 (different locations)	Placed in different locations
# of transits	2.62 / product	
Distance / transit (Ft)	190.72 / product	

The transits times might be decreased by half with a new material layout, based on the products with high rotation.

With the new pick-up process proposal, account and cash customers create orders in advance by phone or order online. When the material is ready to go, they receive an electronic code for the locker’s pick up. Information such as name, email and payment are mandatory to close the transaction. Packing slip signatures, were exchanged for an electronic code that customers scan from their phones. It takes 35 seconds to the machine to deliver the material. Customer experiencing the new purchasing trend feel safer. Considering 2,739 sales (order pick-up) with a 0.11 hours per sale, we obtained a total of 645.62 work hours in 10 months. This time utilized can be reduced by half with the proposed modified layout based on demand and fastener measurement station). With the new proposal the minimum estimated saving is \$22,788.48 in the eight stores around Silicon Valley as shown in Table 2. This

proposal could have a higher impact if implemented across the almost 2,000 branches in the US evaluation.

Table 2: Average Consolidated Time / Sale Operation

Sales /year	Current Sales		Proposal			Saving in Silicon Valley Region			
	Avg. Time / hr.	Total (hr.)	Avg. Time / hr.	Total (hr.)	Delta	\$ Cost/ hr.	\$ Total / hr.	Stores	Total (\$)
2,739	0.11	301.29	0.06	164.34	136.95	\$20.80	\$2,848.56	8	\$22,788.48

Table 2 shows the expected saving due the reduction on transits and the fastener's measurement station. This delta time of 136.95 hours represents 24 business days (3 weeks) and the increase of 9.4% of productivity per day.

Information and Communication Technology tools (ICT) and ERP (Enterprise Resource Planning) tools are used locally to complete or check daily sales operations as sales, consumption, customers, payments and returns. Unfortunately, ERP is not used to evaluate the customer's purchasing habits or patterns or for detecting markets based on commodities or to get ABC analysis to classify materials in value or rotation. Material level is not reliable because a constant counts program is not in place. This situation directly affects the cash customers purchase. If they do not find the product, they will abandon the store and look for other supply options. It is important to involve the employees with the use of ICT for operation planning, organizing, administration and delivery to guarantee transparency in information management. Correct stock levels are mandated by the system to effectively supply products for distribution. Communication with the customer takes place through a call, email or face to face. This communication is based on commercial activities (quotes, purchase orders or pick-up orders) but not concerning COVID-19. Customers did not receive an effective communication to know how the store will operate or how to place an order in advance. This situation generating issues as customers find them simultaneously waiting with other customers. Even though the branch displays guidelines for promoting mask use, some customers do not wear it well or prefer not to wear it. We propose investing the 23 hours saved in activities related to inventory levels review and reinforcing communication with the customer. We encourage the company invite customers to take care of themselves and prevent infections or to request their products or services on request through different channels: telephone, website, social networks, applications, chat, etc.

CONCLUDING COMMENTS

This investigation examines contagious risk, reduce the sale's time, productivity improvement and propose a safer environment practices for pick up orders in a retail store. The proposals described here are relevant for retail stores and supermarkets operations during COVID-19 and for future pandemics or public health crises. Despite having health guidelines at County and State levels, it is necessary to generate business specific models and written protocols under pandemic for every sector. Operations protocols have not been extensively studied and are significant for avoid pandemic spread. The companies also need implement internal audits to review compliance with standard work and health protocols. Tritan company has a lean supply chain channel. However, it needs to reinforce the system in the final element of the chain (retail stores) and reinforce the use of ICT and new electronic resources with their workforce. A plan at the branch level to develop potential customers and re-gain the customers who have stopped coming to the store should be put in place. Implementing promotions, discount vouchers, etc. might help the store gain the customer loyalty. Account customers represent a long-term investment for the survival of the branch, while cash customers allow the company to obtain cash and meet its short-term obligations. Management needs to allocate more resources for a safer sale protocol including customers with account, current cash customers and new prospects. The concept of standardized conditions is not a permanent situation and needs to constantly evolve.

The paper has limitations, the saving result would be more accurate if aspects as the cost of keeping

an employee in the company, as well as the cost of employment taxes and benefits (e.g., health insurance, 401(k)) were be included.

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BIOGRAPHY

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