Improving Outbound Logistics In A Food Factory

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Abstract

The logistics component of every effective supply chain must be the focus to guarantee the timely, safe, and uninterrupted delivery of finished goods to clients. For the finished goods to leave the company's facilities as soon as manufacturing is complete and arrive at a specified destination as quickly as feasible, the outbound logistics system must operate effectively. Adequate outbound logistics guarantees that demand is satisfied at the destination on time and in full, leading to increased sales and ultimately fostering consumer loyalty and satisfaction. Unfortunately, a noticeable amount of time loss has been observed in the food factory outbound logistics, mainly the waiting time for the truck-loading process. This project aims to analyze and minimize the outbound logistics time. It is a valuable opportunity to improve the truck loading process to reduce the negative effect of losing the company's sales and goodwill with customers. This project follows the A3 methodology to analyze the current situation and reduce the related time waste by using Lean tools to identify waste components and find potential areas for development. After data analysis, five suggested solutions were revealed to improve processes and decrease related waste. The paging system solution was chosen because it satisfied the food factory waiting time goal, requirements, specifications, and constraints. This project has shown a noticeable improvement by reducing the waiting time before truck loading in the business-to-business warehouse by 48.18% and retail warehouse by 8.11%. Finally, emotional intelligence recommendations were suggested to improve employee's well-being and reduce their occupational stress.

Keywords
Outbound Logistics, Order Loading, Lean Manufacturing, Emotional Intelligence (EI), Simulation Model.

1. Introduction
The outbound logistics process of the food company involves moving and storing goods from the end of the production line to the customer. The trucks arrive at the gate, go through the gate clearance process, and then queue up randomly based on the space available to load the packs. When the trucks reach the loading area, the warehouse employee will check if their shipment is ready based on SKU availability and shipment urgency. If the order is ready, the truck loading activity will start, if not, they will leave the area and either park in the parking lane or queue up again. The checkout is completed upon receipt of the invoice. A noticeable waiting time has been observed in the food factory. The waiting time is a non-value-added waste in the system, and corrective actions must be taken. The number of trucks waiting inside the factory cannot be controlled due to the third-party logistics company sending them whenever they are free and available, the regulations of Saudi traffic police, and the absence of truck drivers at the loading area. The reasons for the delay and absence of the truck drivers include lack of sleep, lack of respect from others, and low forklift drivers' morale and sense of doing the job. The food factory primary goal is to decrease the time needed for outbound logistics to other businesses and retailers, particularly the time spent waiting for the truck-loading process. To achieve this, the company should consider the permissible times for trucks entering and exiting Jeddah city.

1.1 Objectives

1- Analyse the outbound logistic process from the entrance to the exit.

2- Identify solutions for improving the outbound logistic process.

3- The proposed solution will reduce the waiting time before truck loading by at least five percent.

4- Enhance the emotional intelligence of truck and forklift drivers in the workplace.

2. Literature Review

This section of the report provides an overview of the primary areas covered in the literature review and their respective references. According to Montgomery (2005) and Besterfield (2011), the first aspect is about quality improvement and the use of Lean Manufacturing to reduce waste . The second aspect focuses on emotional intelligence in forklift and truck drivers and how it affects their willingness to work and the organization.

One of the most essential quality tools is Lean Manufacturing, which focuses on decreasing any type of waste. Waste is defined as any extra time, workers, space, property, or items that cannot positively affect service. Waste is categorized into seven categories: overproduction, waiting, transportation, defects, inventory motion, and extra processing. Sundara et al. (2016) studied the implementation of Lean Manufacturing in different organizations to decrease wastage. The third part discusses Multi-Criteria Decision-Making (MCDM) tools, and Mistry (2012) analyzed how to achieve Lean Manufacturing using Value Stream Mapping in a company. VSM works with all activities, which include value-added and non-value-added activities that need to bring all the products from the same source from the raw material till its delivery to the customer. VSM is effective because it shows the entire flow and the source of waste.

The next section of the literature review discusses truck queuing, which is a significant challenge for logistics companies. Three main topics are covered: the Truck Appointment System (TAS), cross-docking, and state-dependent approximation strategy. The TAS is designed to minimize congestion and uncertainty about the truck's arrival time by ensuring an even distribution of trucks arriving during the day. Different studies have proposed a TAS using mixed-integer nonlinear programming (MINLP) algorithms or a dynamic and collaborative Truck Appointment System (DCTAS) using mixed-integer programming (MIP) and discrete-event simulation (DES). Furthermore, studies have also suggested various response strategies to mitigate disruptions caused by TAS, including prioritization and yard crane moving distance. Comparative research using a simulation framework by Wa et al. (2020). focused on varying strategies to solve the problem of truck arrangement, comparing three strategies, and finding that the dynamic rule worked better than the others.

The next research papers will demonstrate the importance of emotional intelligence (EI) in the working environment, the impact of emotional intelligence on the performance of employees and their organizations and specifically truck and forklift drivers. Truck and forklift drivers must satisfy their employer, shippers, and receivers, and must adhere to safety rules and traffic police. Poor sleeping conditions and unpredictable work schedules can lead to psychological stress, putting their health and well-being at risk. Sharfras et al (2018), found that employees with high emotional intelligence are more committed to their organizations and experience less job stress, leading to higher job satisfaction and productivity. The authors argue that emotional intelligence is especially critical in high-stress jobs, such as truck and forklift driving, where stress can lead to health problems and impact job performance. The study also identifies the four components of the EI model: recognizing, understanding, managing, and utilizing emotions. Understanding and managing emotions can lead to improved job performance and job satisfaction, while positive emotional intelligence traits can help manage stress levels in high-pressure environments. According to Scott et al. (2021), emotional intelligence is a crucial factor for qualified supply chain workforce leaders to guide and retain logistics staff, and it involves the ability to perceive, appraise, express, understand, and regulate emotions. EI increases workplace satisfaction, engagement, productivity, and employee retention. The research also highlights the importance of management being receptive to employee input and feedback and fostering a supportive work environment. Judith et al. (2022) found that truck drivers experience various work-related pressures that can lead to burnout, including emotional exhaustion, cynicism, and depersonalization. Burnout negatively affects drivers' job satisfaction and performance, and it is associated with job conflict, ambiguity, poor sleep quality, and the dispatcher's emotional intelligence. Myounghoon et al (2019). found that emotions can negatively impact drivers' subjective safety and driving ability, with anger and happiness being the most significant culprits. Finally, the study of individual differences in emotional intelligence has received much attention in recent years, with the view that employees who understand and control their emotions are more mentally and socially adjusted, especially for demanding jobs like truck and forklift drivers.

The article presented by Thakkar. (2019) explains that MCDM is a crucial method in operations studies, which includes descriptive, prescriptive, and normative analysis types. The article describes the two broad categories of MCDM, which are MADM and MODM, and focuses on the most popular MADM tool, AHP [14]. AHP involves a hierarchal structure that includes criteria, sub-criteria, and alternatives and is an easy and simple technique to apply in various decision-making fields. The article also covers different elements of AHP, such as paired comparisons, normalization, cost-benefit analysis, and semiotics. Saaty. (2008) concludes by discussing how MCDM will contribute to the study's requirements, specifications, and constraints.

To conclude, this literature review has covered multiple aspects of the project to solve the current issue of the food factory. It started with quality and lean manufacturing and how the value stream map would help detect the time wasted in the process. Truck queueing, its impact, and how previous research papers have contributed to solving such a problem. Emotional intelligence and its effect on heavy workloads like truck drivers. Last, the MCDM and how it will contribute to this study, which has multiple requirements, should be satisfied. The next section will demonstrate the requirements, specifications, and constraints.

3. Methods

An A3 report is a one-page document that takes its name from the European International Standards Organization (ISO) 2166 paper size (A3), which has dimensions of 297 by 420 millimeters. The foundation of this methodology is the idea that any form of improvement initiative can be stated on an A3 sheet. Also, it is utilized to apply lean principles to a process in a structured and simple way. Toyota Motor Corporation has established and popularized the A3 approach. They employed this notion for drafting and developing an A3 report for complex and massive data to condense into a brief, intelligible, logically structured document. The A3 methodology will be followed in this research. A3 methodology has eight main steps; each will be explained next.

1- Clarify the Problem: in this step, clarify and explain the situation, the reason for solving the problem, and capture the customer's voice.
2- Breakdown of The Problem: Analyzing and defining the current situation in terms of the scope of the issue, collecting and analyzing data to characterize the process's actual condition and to understand it better.
3- Target Setting: a target is a quantifiable goal representing the desired state of the problem; the goal should be implemented with respect to SMART criteria, which stands for specific, measurable, attainable, realistic, and timely.
4- Root Cause Analysis: identifying and analyzing the causes of the problem and which cause is defined as the driver cause. Also, many quality control tools are applicable in this step.
5- Develop Countermeasures: determine all countermeasures and solutions to address the root causes.
6- Implement Countermeasure: select the countermeasure and solutions, then apply them. Create a detailed action plan.
7- Monitor Results and Process: review the countermeasures' implementation and progress to intervene with corrective measures actions if needed to get the desired outcomes.
8- Standardize and Share the Success: Finally, define the new standard and document the new procedure. Share the findings with all stakeholders and ensure consistency. Plan a training session, specify the following steps, and jointly celebrate the project's success.

4. Data Collection

There were three data collection methods starting by:

1- The data extracted from the food factory Oracle system is for the 2022 year in two excel sheets, one for the retail warehouse and the other for the business-to-business (B2B) warehouse. Both includes working day, shift, gate-to-gate time (G2G), trucks loaded, transferred, pended, on-time delivery, in-full delivery, total waiting time, waiting time before truck loading, and waiting time after truck loading.

2- The team conducted a questionnaire to measure the EI score of truck and forklift drivers. The questionnaire was prepared in two languages, English and Urdu, and it had three sections: the title "Emotional Intelligence Questionnaire," the general information about the respondent, the age group of the respondent and daily working hours, and the EI questions derived from the literature. The sample size for the day of visiting the food factory was 26 truck drivers, and seven out of eight were surveyed using the same confidence level and margin of error.

3- The engineer conducted a face-to-face interview with the manufacturing excellence manager in the food factory to collect reliable data on the emotional intelligence of truck drivers. The questions asked included whether truck drivers are tired or stressed, if they spend time on unnecessary tasks, if they are aggressive, if they meet deadlines based on feedback from the third-party company, and if they are able to get along with one another. The answer showed that there is no agreement among truck drivers, especially regarding loading times, and priority is given to the one who weighs first, receives the ticket, and starts loading. This has caused a crowd to form and conflicts between drivers.

5. Results and Discussion

5.1 Numerical Results

1- After collecting and validating the data, the data analysis phase is required to understand the current situation and how to improve it. First, the retail warehouse data will be demonstrated and analyzed, then B2B warehouse analysis will be followed (Table 1).

Retail Warehouse

Table 1. Retail Warehouse Data

Working Date	Total Loading	Total Transfer	Total Pending	Total On-Time Delivery	Total In-Full Delivery	Total On-Time-In-Full Delivery
2/7/2022 - 7/4/2022	4512	323	967	2722	3449	2089

Table 2. Retail Warehouse Data

KPI's	Formula	Calculations
DIFOT	$\frac{\text{Orders delivered in full, on time}}{\text{Total units or orders shipped}} \times 100$	$\frac{2089}{4512} \times 100 = 46.30\%$
OTD	$\frac{\text{Order delivered on time}}{\text{Total units or orders shipped}} \times 100$	$\frac{2722}{4512} \times 100 = 60.33\%$
IFD	$\frac{\text{Order delivered in full}}{\text{Total units or orders shipped}} \times 100$	$\frac{3449}{4512} \times 100 = 76.44\%$

The food factory has a specific target in DIFOT KPI, which is equal to 85% in each warehouse. As illustrated in the Table 2, the DIFOT currently is 46.3%, far from the target by 38.7%, OTD is 60.33%, and IFD is 76.44%. It is a noticeable gap from the target.

B2B Warehouse

Table 3. B2B Warehouse Data

Working Date	Total Loading	Total Transfer	Total Pending	Total On-Time Delivery	Total In-Full Delivery	Total On-Time-In-Full Delivery
2/2/2022 - 7/5/2022	7886	572	4277	7232	7543	6925

Table 4. B2B Warehouse Calculations

KPI's	Formula	Calculations
DIFOT	$\frac{\text{Units or orders delivered in full,on time}}{\text{Total units or orders shipped}} \times 100$	$\frac{6925}{7886} \times 100 = 87.81\%$
OTD	$\frac{\text{Order delivered on time}}{\text{Total units or orders shipped}} \times 100$	$\frac{7232}{7886} \times 100 = 91.71\%$
IFD	$\frac{\text{Order delivered in full}}{\text{Total units or orders shipped}} \times 100$	$\frac{7543}{7886} \times 100 = 95.65\%$

As shown in the Table 4, the DIFOT currently is 87.81%, OTD is 91.71%, and IFD is 95.65%. It is a noticeable gap from the target. In B2B warehouse the goal of on-time, in-full delivery is accomplished, but further analysis for waiting.

2- The data from a Google Forms survey was imported into an Excel sheet and modified using the find and replace tool to convert responses to numerical scores. Separate sheets were created for each dimension, and the data was sorted alphabetically to separate truck drivers from forklift drivers. Scores for each respondent were calculated and averaged using the SUM and AVERAGE functions. The results are summarized in Table 5.

Table 5. Averages of forklift and truck drivers EI score

Age group	Self-Awareness		Managing Emotions		Motivating Oneself		Social Skills	
	FD	TD	FD	TD	FD	TD	FD	TD
Less than 18	_	17	_	14	_	11	_	12
18-20	23	16.67	18	17.67	15	19.67	19	17
21-35	18.5	20.09	13	15.82	19	16.18	17	17.73
36-55	19.67	15.43	14.33	14.71	20.67	14.43	21.33	13.71
More than 55	14	14.25	15	18	24	16.5	14	20

Table 6. Averages of forklift and truck drivers EI score with respect to age group

	Forklift Drivers	Truck Drivers
Self-Awareness	19	17.4
Managing Emotions	14.6	16
Motivating Oneself	19.8	16
Social Skills	18.7	16.7

The interpretation of these scores is as follows:

- 21-30 This area is a strength of the respondent.
- 11-20 Giving attention to where the respondent feels they are weakest will pay rewards.
- 6-10 Make this area a development priority.

Table 6 shows that respondents may have been hesitant to answer questions honestly due to the direct nature of the questions. The text highlights the importance of self-awareness, managing emotions, motivating oneself, and social skills in EI. The age groups of 36-55 scored highly in motivating oneself and social skills for forklift drivers, while the age group of 21-35 scored highly in self-awareness for truck drivers. Age group 18-21 had the highest average score in self-awareness for forklift drivers.

5.2 Graphical Results

The purpose of this step is to analyze the current situation in terms of the scope of the issue, collecting and analyzing data to determine the actual condition of the process. Many tools can be utilized in this step depending on the type of problem and the process. In this project, a current VSM tool will be used to analyze the current situation and to identify the value-added and non-value-added activities, in order to develop a future value stream map after reducing the non-value-added activities (Figure 1 to Figure 6).

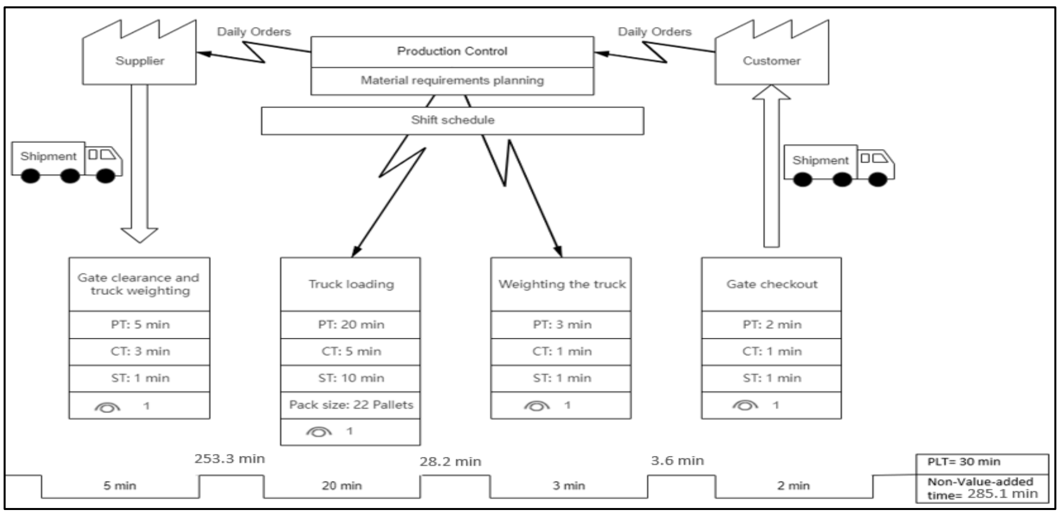

Figure 1. Current FPD Value Stream Map

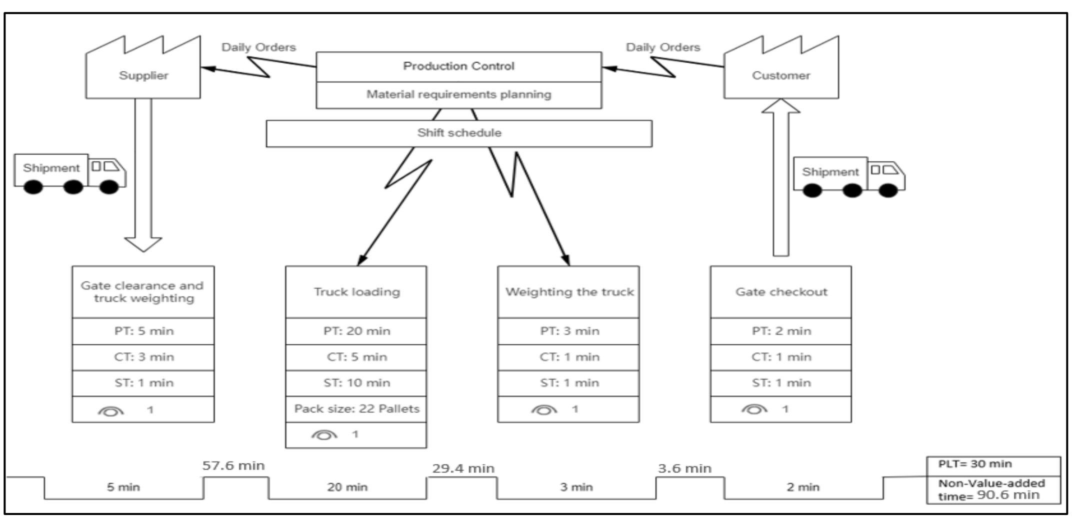

Figure 2. Current Retail Value Stream Map

The Value Stream Map (VSM) analyzes the outbound logistic process, which includes gate clearance and truck weighting, truck loading, weighting the truck, and gate checkout. The process time is defined as the amount of time elapsed between entering and leaving a process, cycle time is how often a process completes a product, setup time is all activities between the completion of a good product and the start of the next unit or batch, and pack size is the quantity of product required for shipment by the customer. The PLT for the FPD process is 30 minutes, while the waiting time is 285.1 minutes.

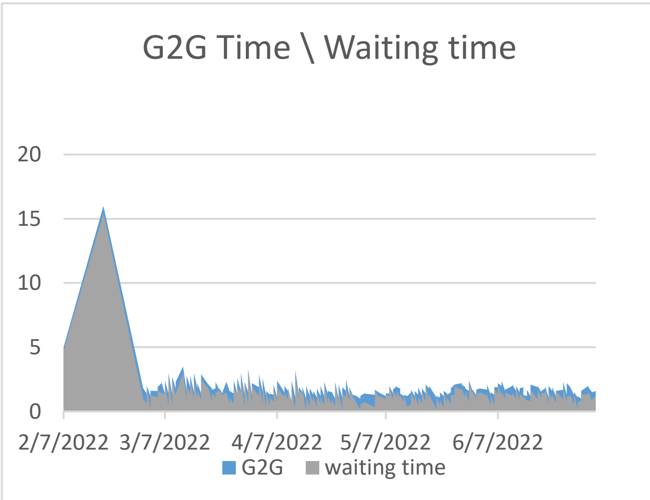

Figure 3. G2G and Waiting Time

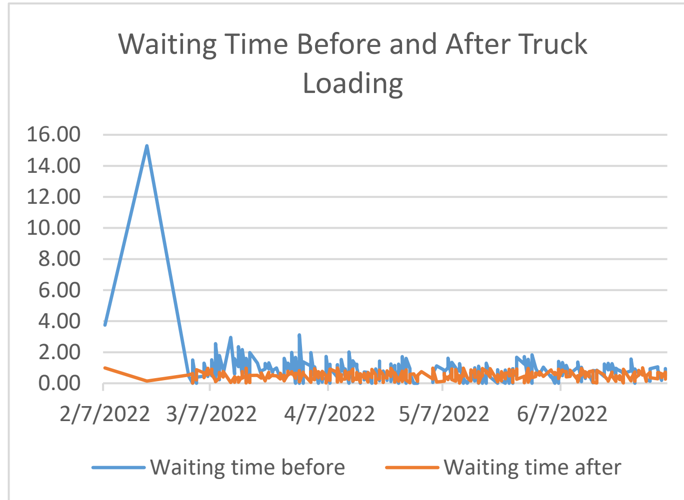

Figure 4. Waiting Time Before and After Truck Loading

The above shown charts are for retail warehouse, where the x-axis represent the time period, and y-axis represent time. An area graph is a specialized form of a line graph that shows the change cumulatively or day by day over a time period. Also, it emphasizes the differences between multiple data sets, representing part of the whole relationship. It can be shown that the waiting time is taking the majority time proportion from the gate-to-gate time, it is a critical indicator of a waste happening. The waiting time has a minimum of 0.045, maximum of 15.43, mean of 1.27, and standard deviation of 1.02. A time series graph represents a piece of data that is tracked over a period of time. In the above chart, the metric referred to is waiting time before and after truck loading. It can be concluded that the waiting time before truck loading is higher than after.

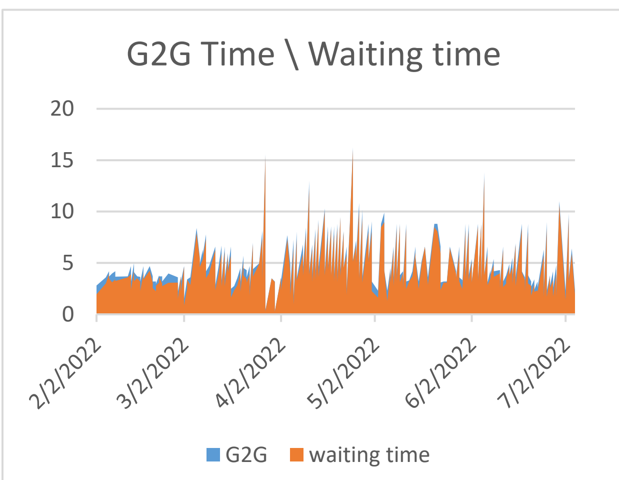

Figure 5. G2G and Waiting Time

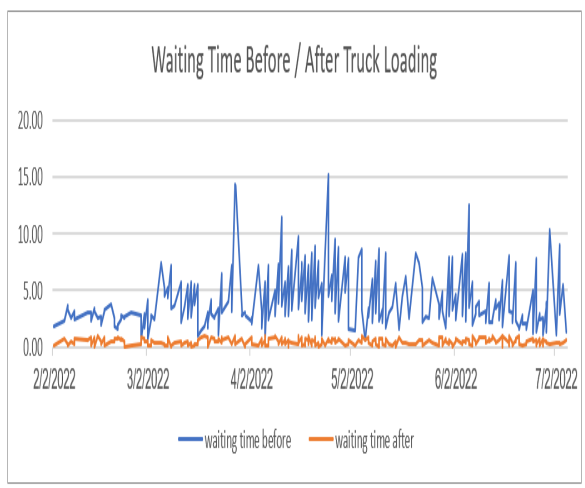

Figure 6. Waiting Time Before and After Truck Loading

Both two charts above the x-axis represent the time, and y-axis represent time. It can be shown that the waiting time is taking the majority time proportion from the gate-to-gate time, the same critical indicator of a waste happening in B2B warehouse. The waiting time has a minimum of 0.264, maximum of 15.98, mean of 4.62, and standard deviation of 2.48. In Figure (6), the metric referred to is waiting time before and after truck loading. It can be concluded that the waiting time before truck loading is higher than after. Next B2B warehouse in/out flow will be demonstrated through area graph.

5.3 Proposed Improvements

The article discusses proposed solutions for reducing long waiting times and increasing efficiency at the food factory. The proposed solutions include implementing a paging system, or as proposed by Eid (2021), increasing the number of forklifts, increasing the number of trucks, or a combination of these solutions. It is suggested to increase one forklift per truck or one truck in the loading area, not more, due to space limitations. The implementation of a paging system will help the warehouse employees and truck drivers coordinate their communication and improve the outbound logistics process. The suggested solutions aim to decrease the loading time per truck, the waiting time, and the number of trucks in queues (Eid, 2022). The chosen solution for food factory problem is a paging system that provides communication between truck drivers and warehouse management, and costs around 2,200 SAR within the project's budget. The solution is easy to implement and operate, reducing the waiting time before truck loading for FPD and RTL compared to the base model is 48.18% and 8.11% respectively.

The food factory has both local and global impacts in different fields and industries, such as improving Saudization and supporting Saudi Vision 2030. By implementing the solution, food factory can take advantage of various opportunities nationally and internationally, attract investors, and achieve a higher global ranking. The solution may also decrease costs and increase revenue. The project focuses on truck and forklift drivers' psychological and emotional well-being and, by achieving this, it may positively affect the company's reputation, increasing sales and profits (Professional ethics and codes of Conduct, 2018).

The solution also has a significant environmental impact by reducing NOx and PM emissions (Khan, 2009). Finally, the project will have professional and ethical impacts on the food factory, improving customer satisfaction and strengthening relationships while adhering to professional rules of conduct (Professional ethics and codes of Conduct, 2018).

5.4 Validation

In order to model the future state of the food factory, a simulation base model was modeled using Simio software to represent the current state as shown in Figure (7).

Current Situation

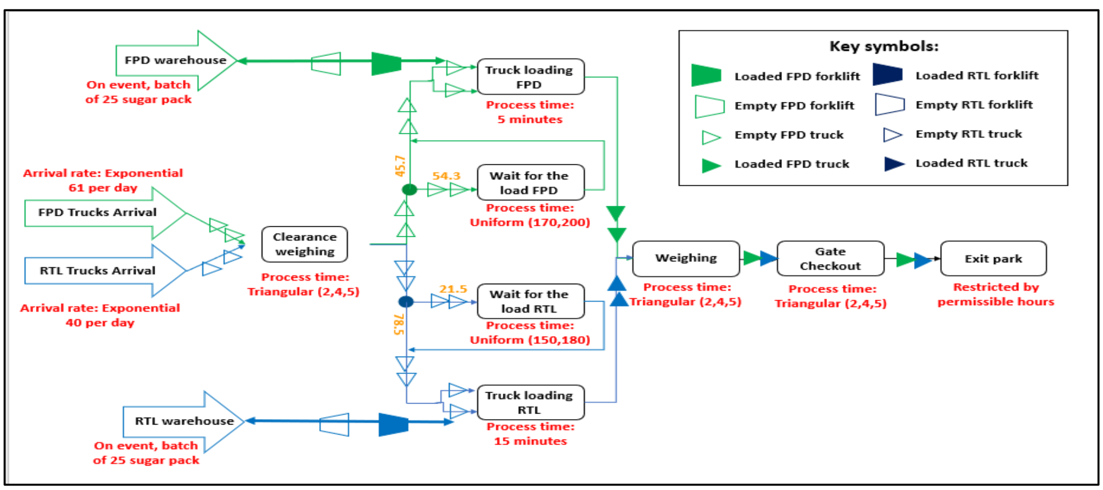

Figure 7. Schematic Diagram for Current state in Simio model

The simulation was run for 7 days to represent the data in the provided Excel sheet. There are two types of entities entering to the sources FPDTruckArrivals and RTLTruckArrivals, FPD trucks in white and RTL trucks yellow. FPD trucks interarrival time is Random. Exponential (24/61) per hour as 24 represents the hours of the day and 61 is the average number of trucks per day as calculated using Arena input analyzer in Appendix K. Also, the RTL trucks interarrival time is Random. Exponential (24/40). Then the trucks will enter the facility at the gate clearance and weighing with server time of [Random. Triangular (2,4,5)] minutes. After that the trucks will queue to reach the loading area, however some trucks arrive at the loading area and their orders are not ready yet, so they queue in the line from the start. The percentage of trucks which their order was not ready at the warehouse was calculated from the provided Excel sheet by this formula $\frac{Total\ number\ of\ pending\ trucks}{Total\ number\ of\ loaded\ trucks} \times 100$, while the percentage of trucks which their order was ready at the warehouse was calculated as $[1 - \left(\frac{Total\ number\ of\ pending\ trucks}{Total\ number\ of\ loaded\ trucks} \times 100\right)]$, the percentages was calculated for both FPD and RTL trucks. Then there is the truck loading combiner that have capacity of serving 2 trucks at a time with 4 forklifts utilized at each loading area. Each truck is loaded with 25 packs of foodstuffs and the loading process is done by 2 forklifts per truck. After loading will be the truck weighing and gate checkout which both have processing time of [Random. Triangular (2,4,5)].

Paging System

In the paganing system model is shown in the Figure (8), the trucks will wait only one time in the queue. Unlike the base model where the trucks are arriving to the loading area based on first come first reaching to the loading area. Then the trucks are facing a problem when the order is not ready, so the trucks will queue at the beginning of the line. However, in this alternative model, the trucks will wait for one time only, because the truck driver will not go to the loading area unless he receives a message from the paging unit that the order is ready. Also, the waiting time was reduced by 10 minutes which is the time assumed to be lost in the base model when the forklifts needed to go to call the truck drivers to come to the loading area.

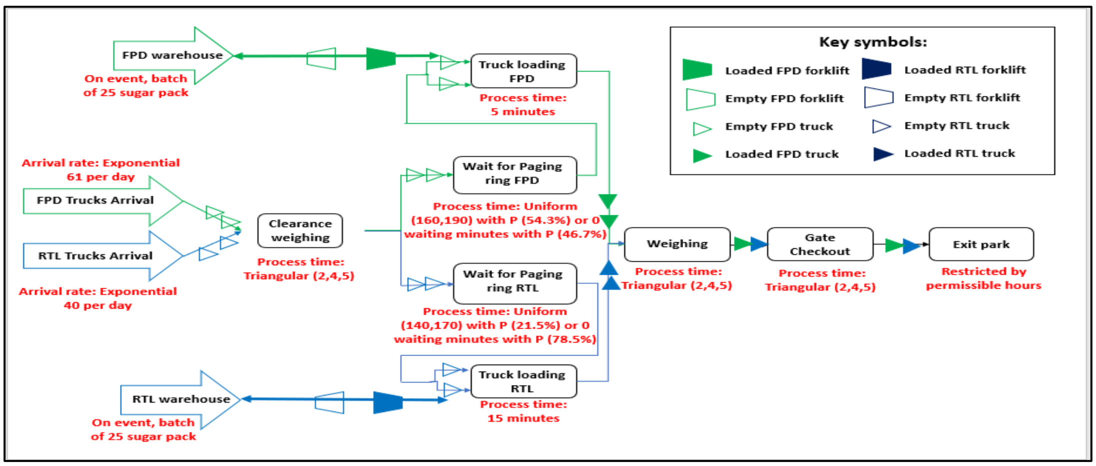

Figure 8: Schematic Diagram for first alternative in Simio model

6. Conclusion

In conclusion, this project worked to improve the logistical processes in the food factory, focusing on the outbound logistical process. The problem related to the current situation have been identified in this project previously. The current situation was analyzed using the A3 methodology. Additionally, alternative solutions to this current problem have also been proposed and evaluated. Accordingly, the most effective solution was selected, which was the paging systems solution, since it met the food factory waiting time goal, requirements, specifications, and constraints. The team achieved the customer requirements, including ease of implementation, reduction of waiting and turnaround time, maintainability, and testing before submission. The project objectives, including analyzing the outbound logistics process, identifying solutions, reducing truck turnaround time, and enhancing emotional intelligence, were also achieved. The project solved the problem statement by improving the truck loading process and reducing waiting and turnaround time. The team recommends improving communication and establishing a schedule among the food factory and third-party companies, organizing training sessions for truck drivers, and conducting a feasibility study.

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Biographies

Ammar Y. Alqahtani, PhD, is an associate professor of Industrial Engineering at King Abdulaziz University in Jeddah, Saudi Arabia. He received his BS degree with first honors from the Industrial Engineering Department of King Abdulaziz University, Jeddah, Saudi Arabia, in May 2008. Being awarded with a full scholarship by the King Abdulaziz University (KAU), he received his MS degree in Industrial Engineering from Cullen College of Engineering, University of Houston. In September 2012, he started his PhD studies in Industrial Engineering at

Northeastern University, Boston, Massachusetts. He received his PhD degree in 2017. He has been employed as a faculty member by King Abdulaziz University since December 2008. His research interests are in the areas of environmentally conscious manufacturing, product recovery, reverse logistics, closed-loop supply chains (CLSC), sustainable operations and sustainability, simulation and statistical analysis and modeling with applications in CLSC and multiple life-cycle products. He has published two books, titled *Warranty and Preventive Maintenance for Remanufactured Products Modeling & Analysis* and *Responsible Manufacturing Issues Pertaining to Sustainability*. He has coauthored several technical papers published in edited books, journals and international conference proceedings. At Northeastern University, he won the Alfred J. Ferretti research award. He also received the 33rd Quality.

Lara Alzain was born in Jeddah, Saudi Arabia, on the 28th of February 2000. Goal and detail-oriented senior industrial engineering student who constantly seeks improvement in her skills and education. Successful at managing multiple priorities with a positive attitude. Outstanding communication, problem-solving, and analytical skills. Reflecting her interest in lean manufacturing principles. During the whole industrial engineering journey, she has recalled her knowledge from the courses and beyond to apply it to organizations to assist them in better functioning. In most projects, the team aimed for a specific area to improve, such as worker safety. Does the organization's facility assist in a better workplace for its users? And other many examples. But the one time she enjoyed solving a problem and helping an organization suffering from pain was in my senior design project. Since the company proposed the issue and asked the team to solve it, then they visited the company to observe the process, searched for root causes, what has caused the case, and which form of these causes is the major one, then tried to combine all the solutions proposed to solve such a problem and improve the current situation of the food factory.

Bashayer Alkhamisi was born in Jeddah, Saudi Arabia, in 1999. Her passion for research and learning began at a very young age. She became interested in industrial engineering when she visited a factory in her town and learned about the various fields of industrial engineering. She is a senior industrial engineering student at King Abdulaziz University in Jeddah at present. As part of her specialization, she was involved in many projects; however, her most important project was the senior design project, which involved improving the food factory's outbound logistics process. Through a systematic and scientific approach, she and her team solved the problem of the project. In addition, Bashayer knowledge of industrial engineering has become an integral part of her life, therefore she is capable of solving problems, demonstrating critical thinking, and gaining a range of other skills. Finally, Bashayer is passionate about industrial engineering and has a high ambition for this specialty.

Aldana Basuni was born in Jeddah, Saudi Arabia, in 1999. Throughout her academic journey, she has demonstrated a keen interest for mathematics and problem-solving, and her passion for the field of industrial engineering has been evident from a young age. Currently a senior industrial engineering student at King Abdulaziz University in Jeddah, Aldana has consistently exhibited strong critical thinking skills and process optimization abilities. As part of her academic curriculum, Aldana has participated in various research projects that seek to enhance industrial processes. The major project was her senior design project with her team involving optimizing the order loading process at a local food factory, which necessitated her expertise in process mapping, operations research, and supply chain management. Dedication to the project was evident in Aldana's exceptional findings, which provided valuable insights into the order loading process at the food factory. Aldana's passion for industrial engineering is rooted in her belief in the transformative power of technology and innovation to revolutionize the way we live and work. Aldana is determined to complete her degree and continue making significant contributions to the field of industrial engineering. In conclusion, Aldana Basuni is an exceptional female engineer with a deep-rooted passion for industrial engineering. Her participation in the research paper on the order loading process at a local food factory underscores her proficiency in process optimization and critical thinking. Aldana's dedication to her academic pursuits is a testament to her commitment to excellence.