



Process Optimization in Packaging Lines



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Problem Statement: The packing line operates with 4 employees. An "idle time" of 39% has been observed, along with manual palletizing and documentation, repetitive tasks, and walking distances of up to 367 feet for one employee, leading to waste and opportunities for optimization.

DEFINE

Introduction

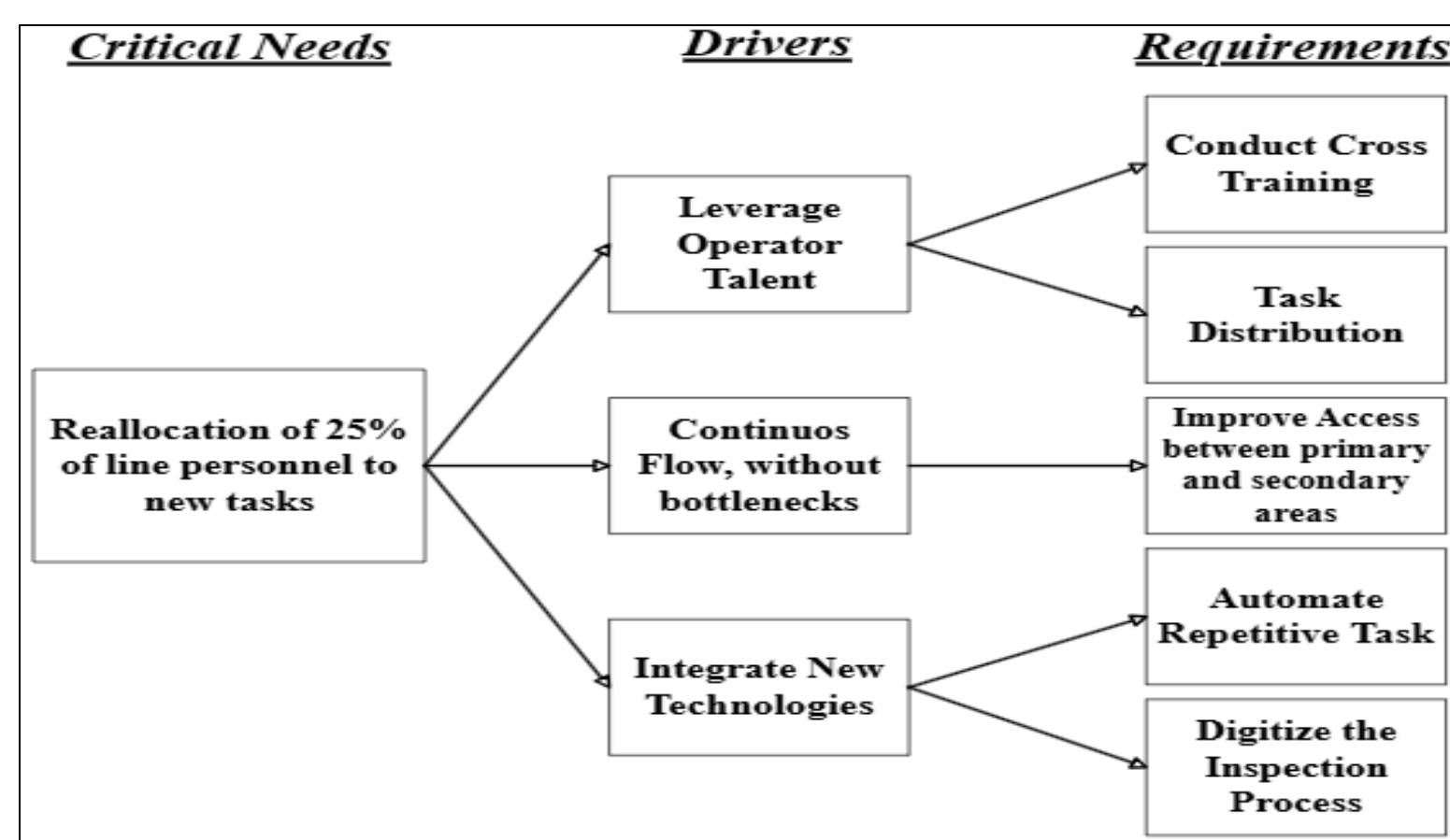
Viatrix is a global pharmaceutical company dedicated to producing and distributing high-quality essential medicines. To enhance its operational efficiency and maintain high quality standards, it has set strategic goals such as redistributing 25% of the workforce, digitizing inspections, automating filling and palletizing processes, and optimizing internal workflows. These actions aim to reduce idle time, minimize travel distances, and improve productivity, reflecting the company's commitment to continuous improvement and innovation.

VOC

Voice of the Customer Translation Matrix

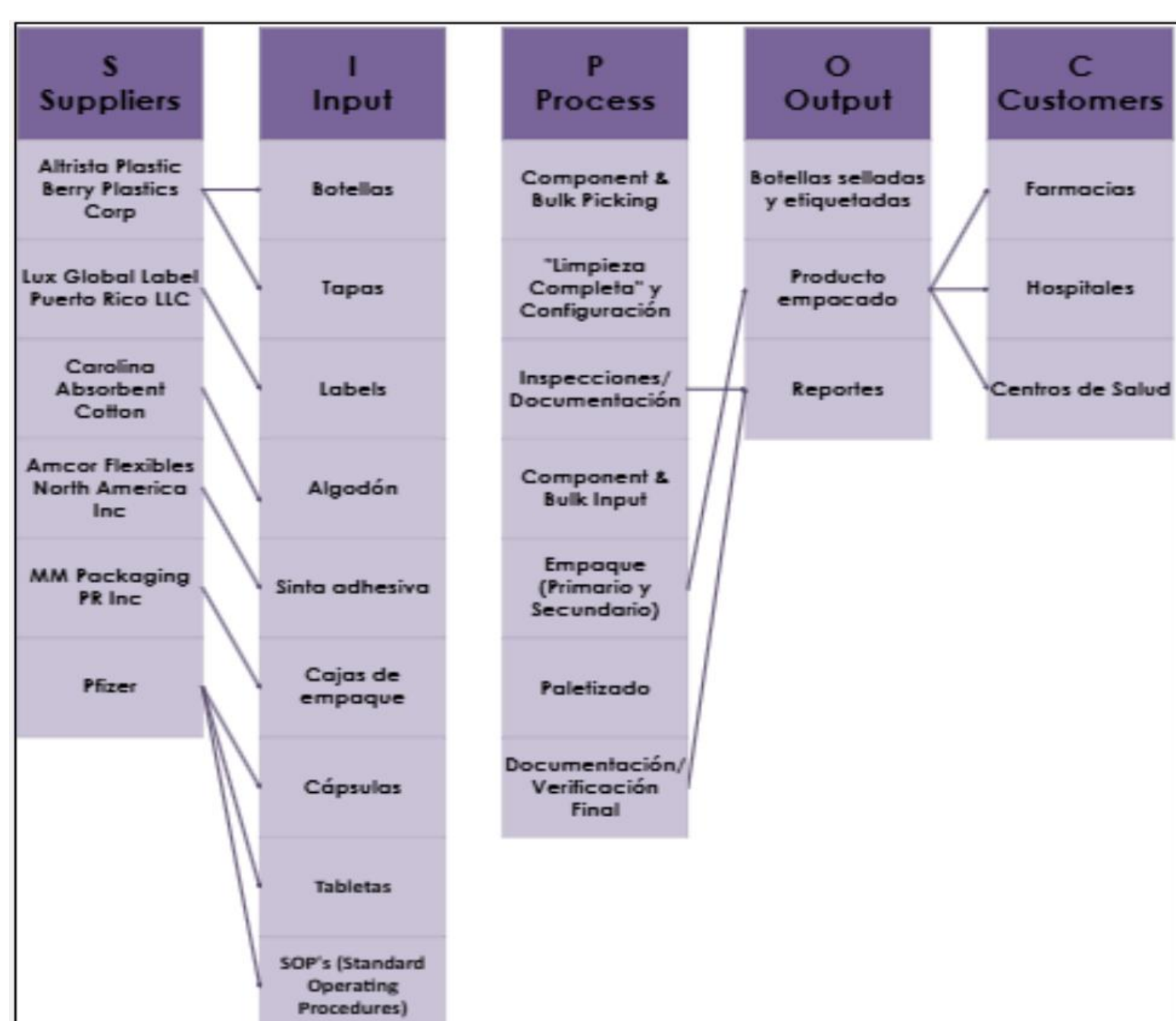
Customer Comment	Gaining Deeper Understanding	Customer Requirements
Improve operational efficiency and optimize headcount in the packaging process.	Current processes are perceived as less efficient compared to industry standards.	A detailed analysis of the current workflow in the packaging process.
Ensure process optimization without compromising productivity or product quality.	There is a need to align operations with Viatrix benchmarks to reduce costs and improve competitiveness.	Proposals to optimize personnel use without affecting quality or efficiency. Implementation of a plan that minimizes operational costs and delivers measurable results.

CTQ Tree



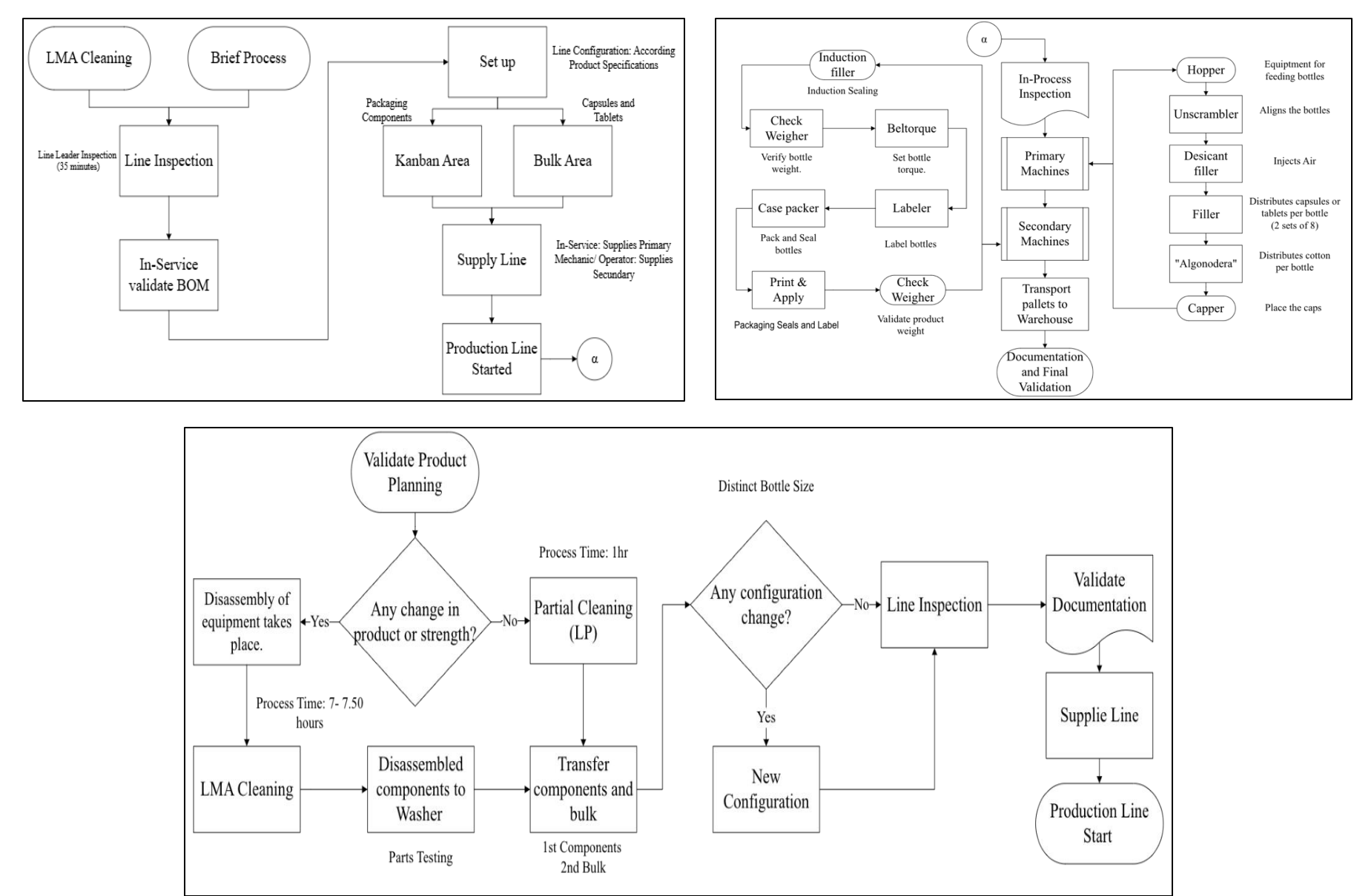
To meet customer needs, a CTQ (Critical to Quality) tree was developed. Enhancing operator talent involves cross-training and balancing task distribution to ensure flexibility and prevent overload. Improving workflow focuses on eliminating bottlenecks by enhancing access between primary and secondary areas, which reduces travel time and supports smoother operations. Incorporating new technologies includes digitalizing inspection processes and automating repetitive tasks to modernize operations and make tasks easier for operators.

SIPOC

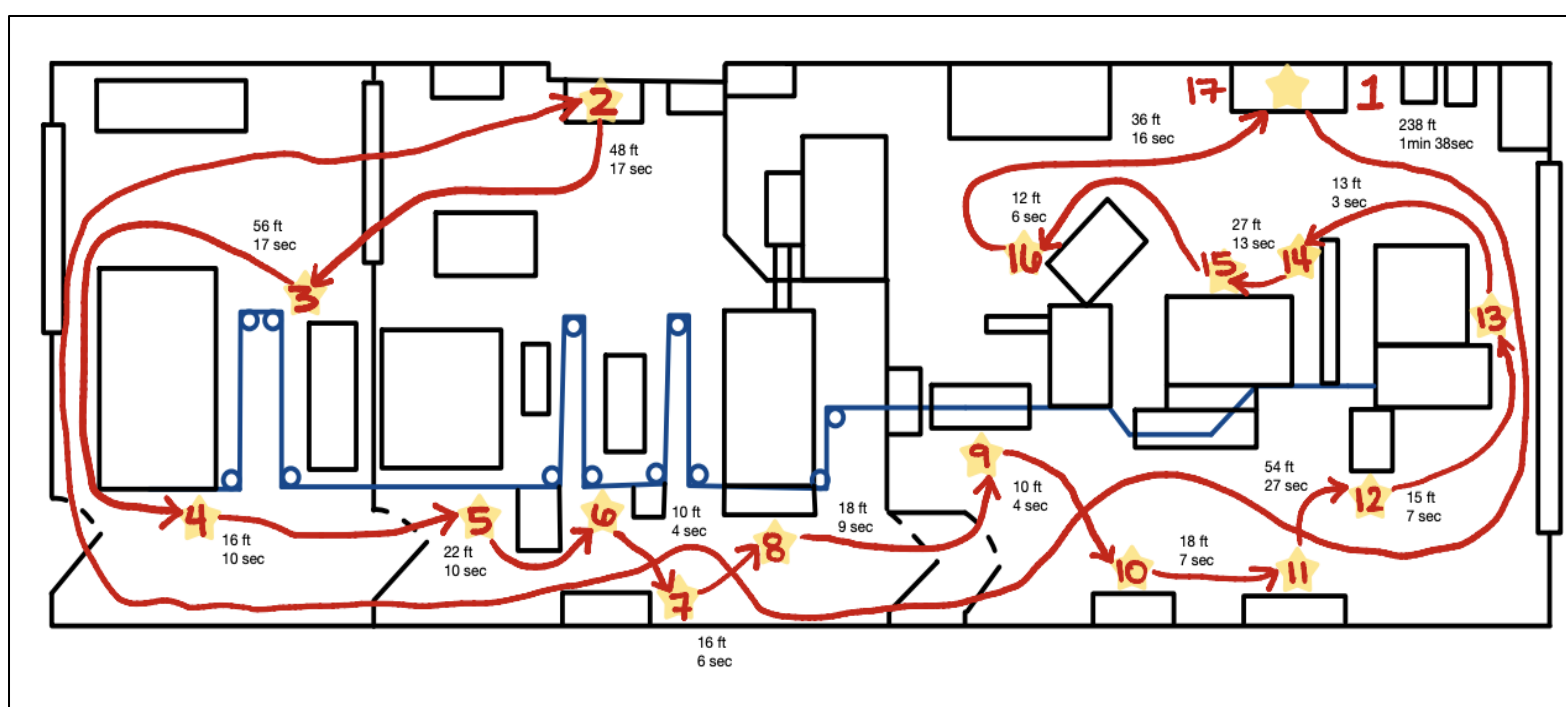


MEASURE

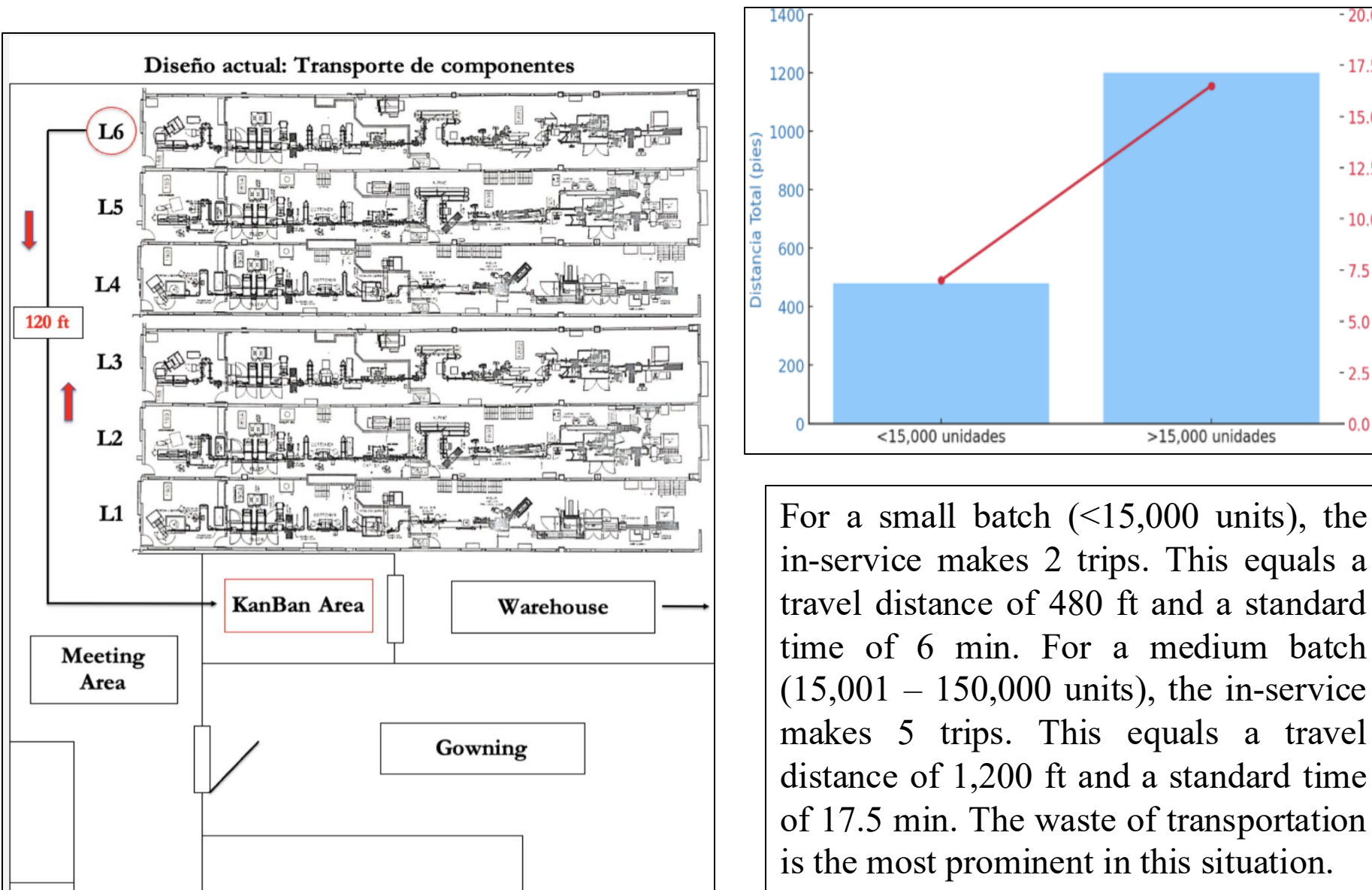
Process Flowchart



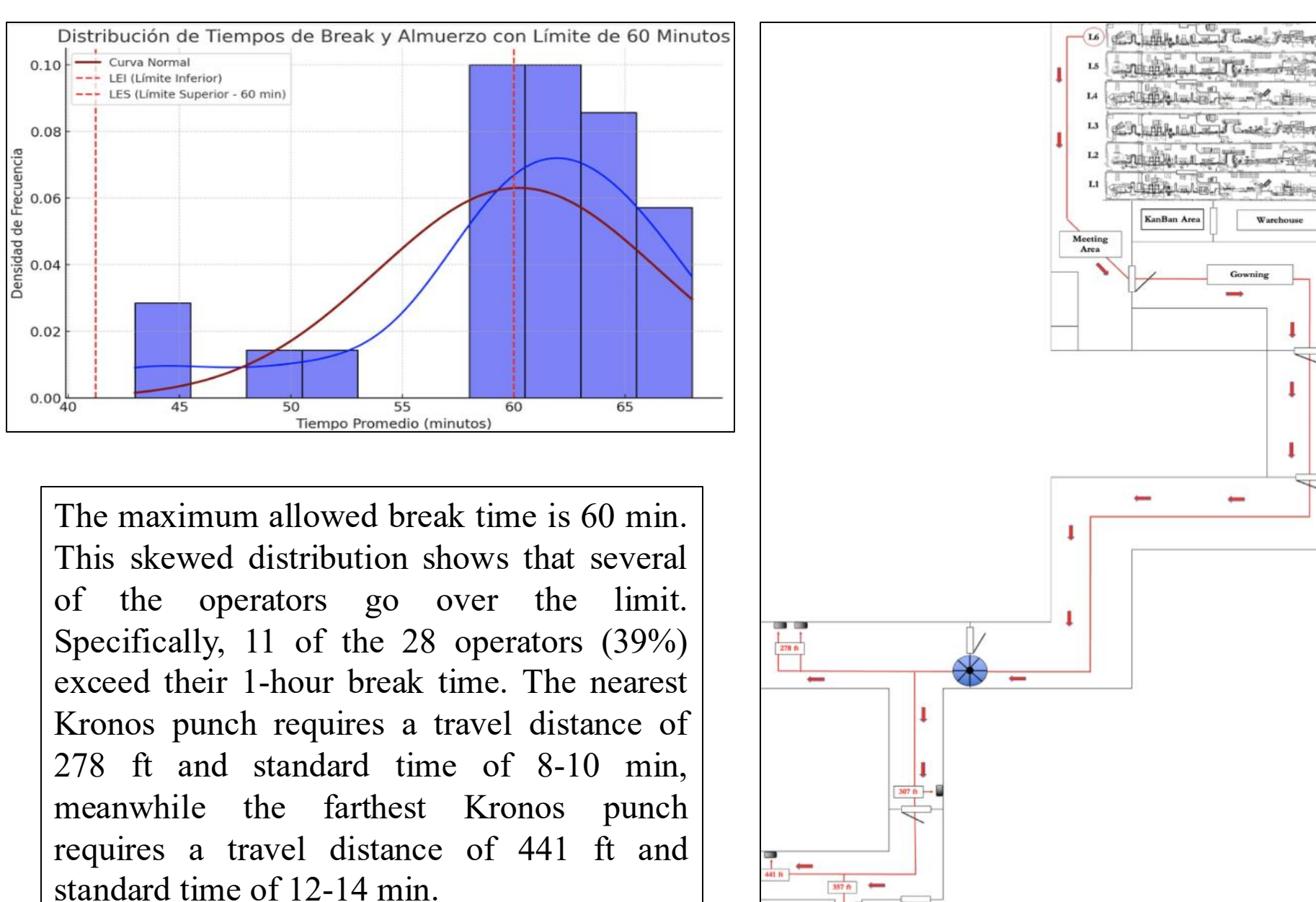
Spaghetti Diagram "In-process"



Travel Distance "In-service"

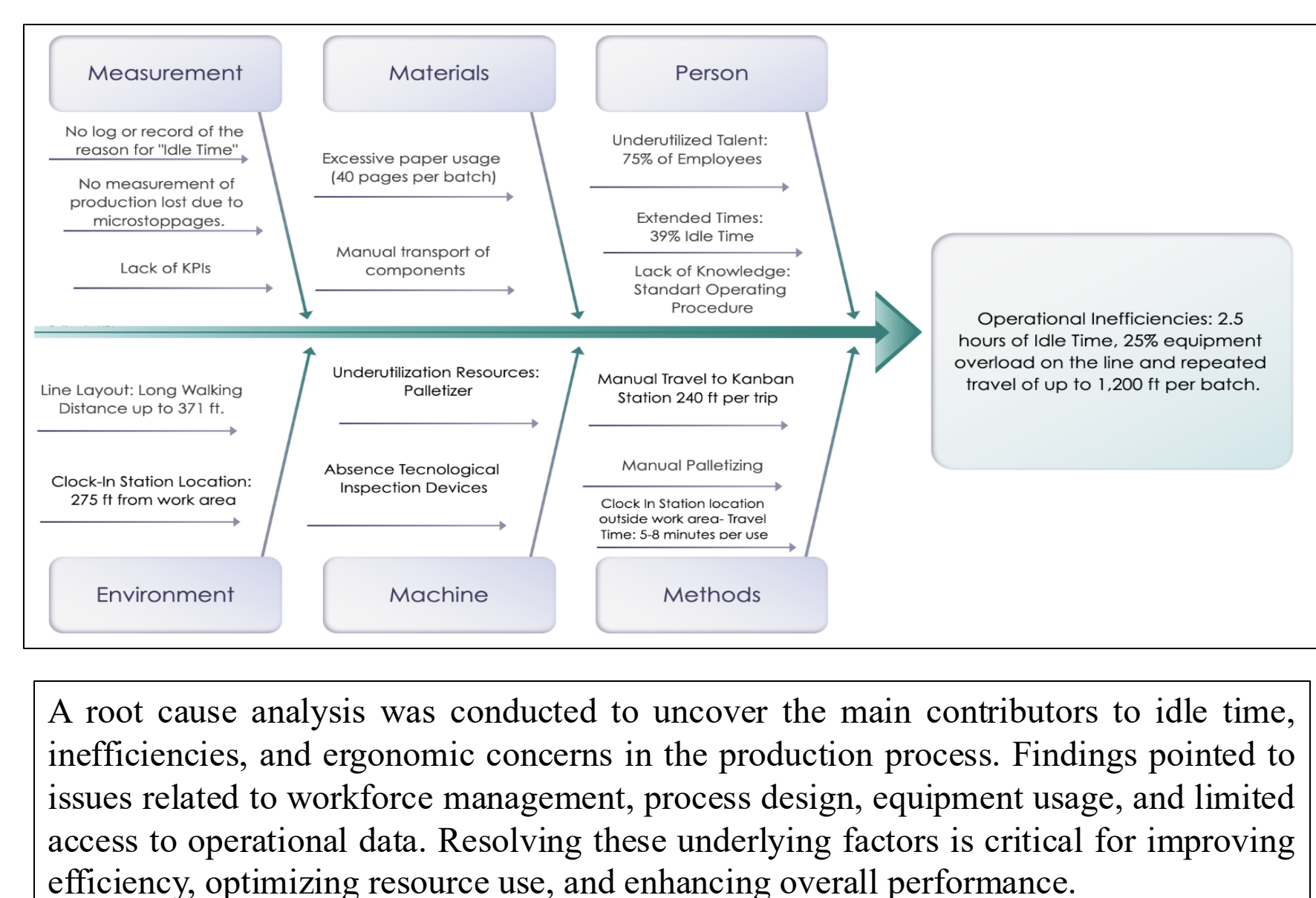


Journey to Kronos



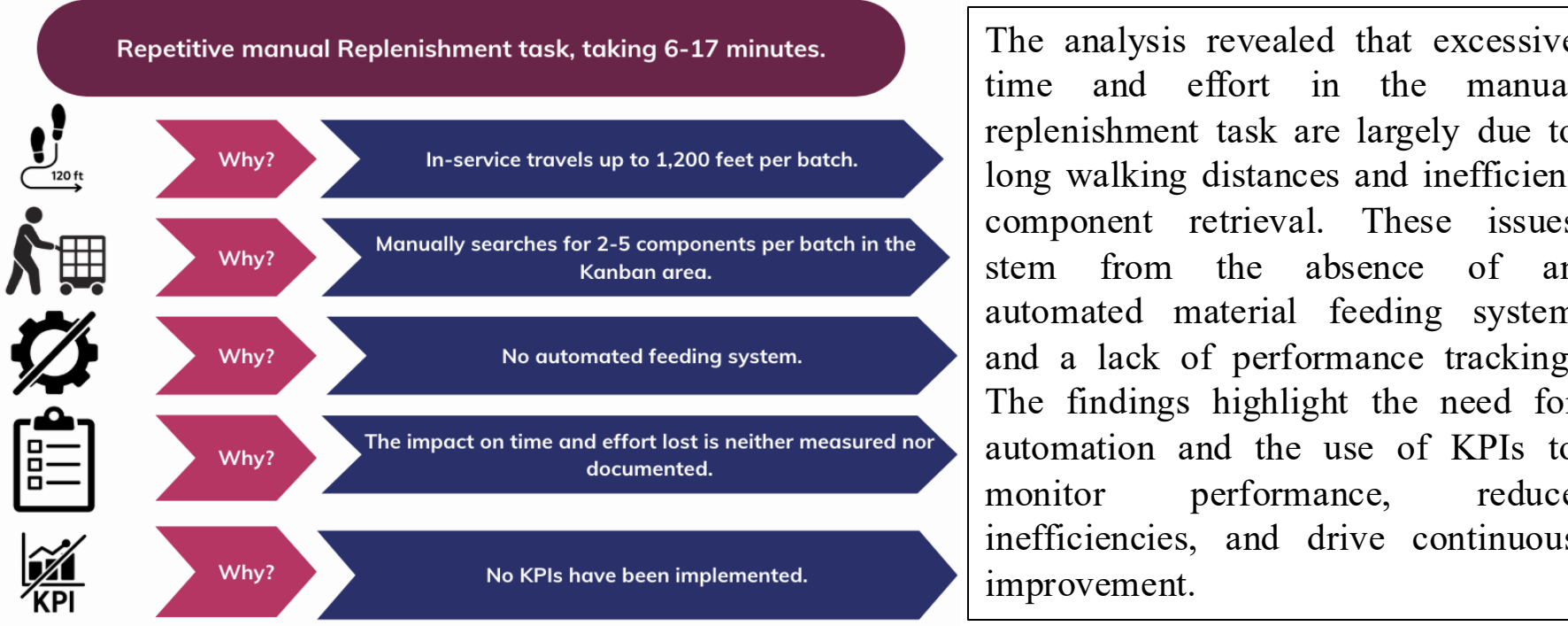
ANALYZE

Ishikawa Diagram

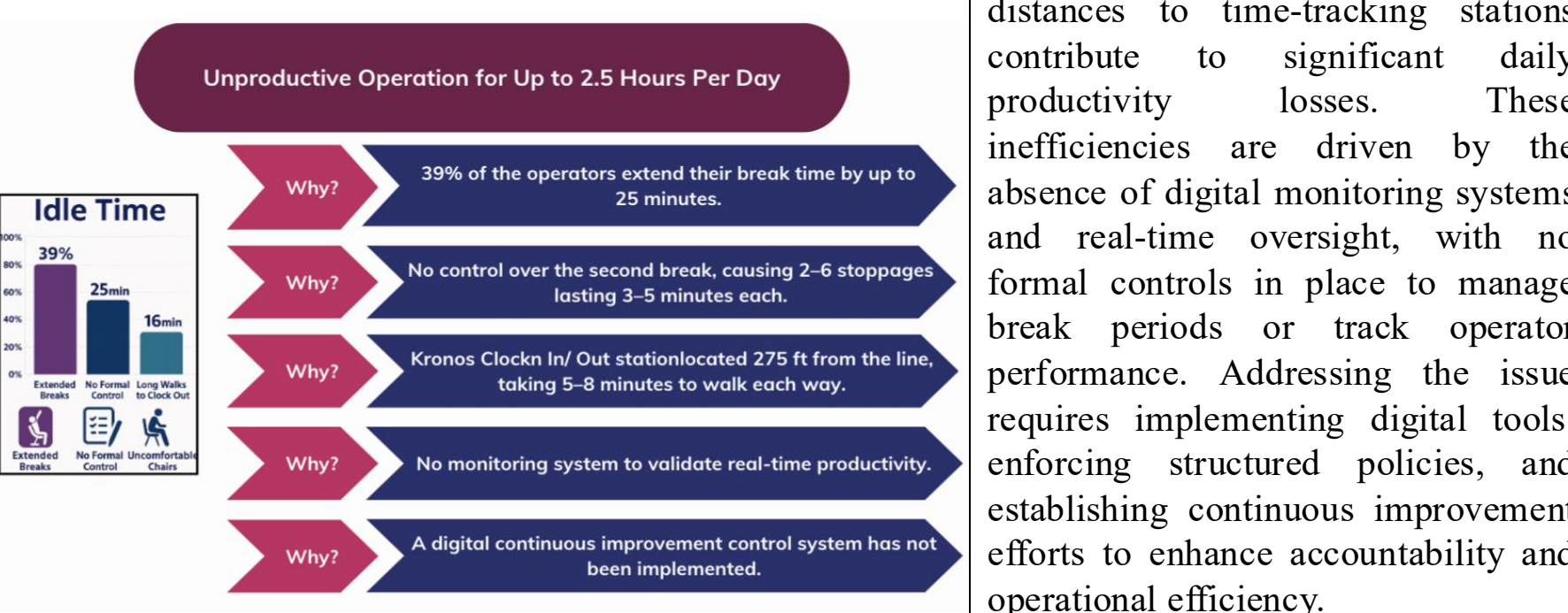


A root cause analysis was conducted to uncover the main contributors to idle time, inefficiencies, and ergonomic concerns in the production process. Findings pointed to issues related to workforce management, process design, equipment usage, and limited access to operational data. Resolving these underlying factors is critical for improving efficiency, optimizing resource use, and enhancing overall performance.

5 Whys



A small portion of operators are handling the majority of in-process inspection tasks, while most trained personnel remain underutilized due to uneven task distribution and a fully manual process. The root cause is the lack of a digital inspection system and structured efforts to modernize or balance responsibilities. Addressing this requires digitalization, clear task allocation, and ongoing improvement initiatives to enhance efficiency, sustainability, and overall performance.

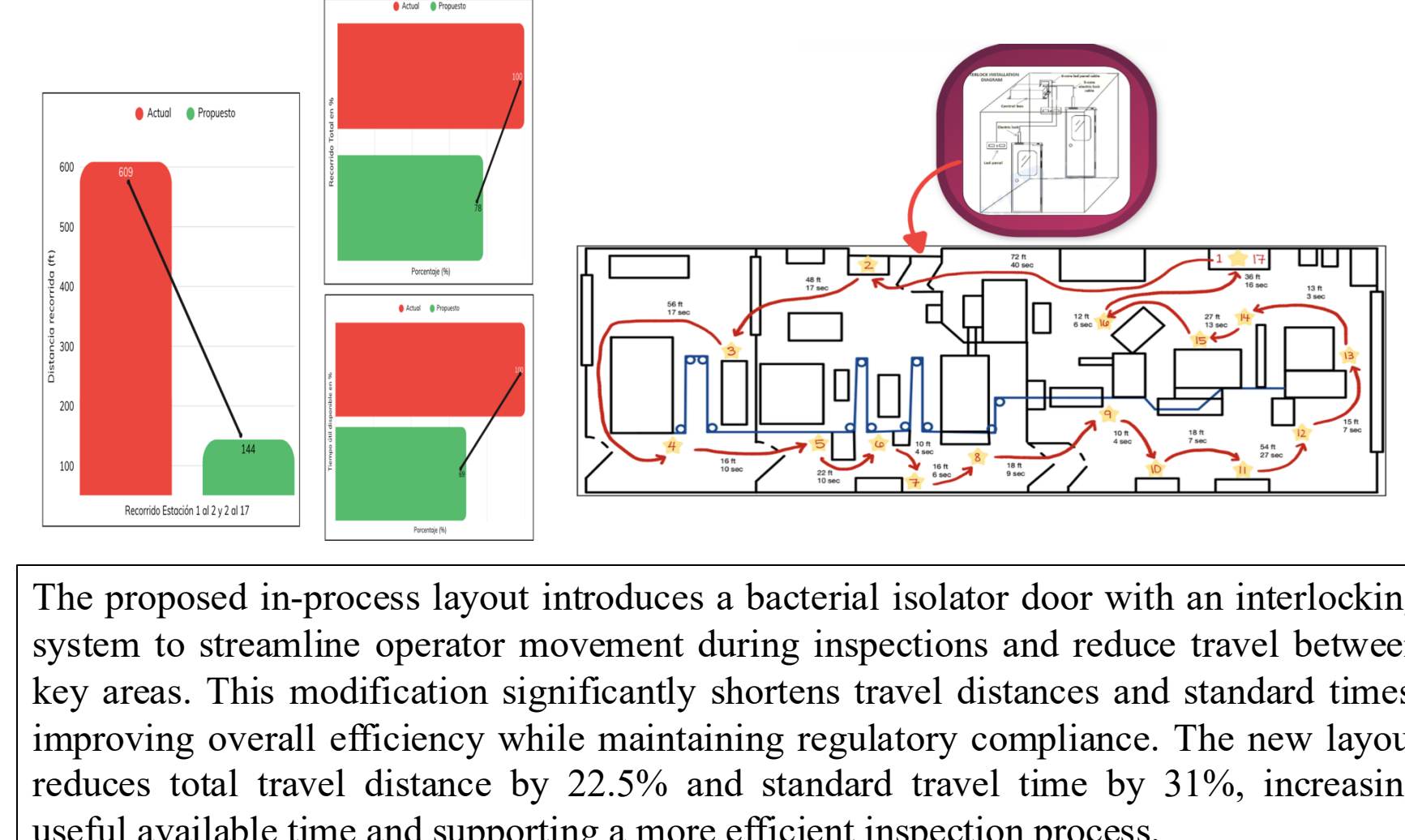


Lean Waste Found



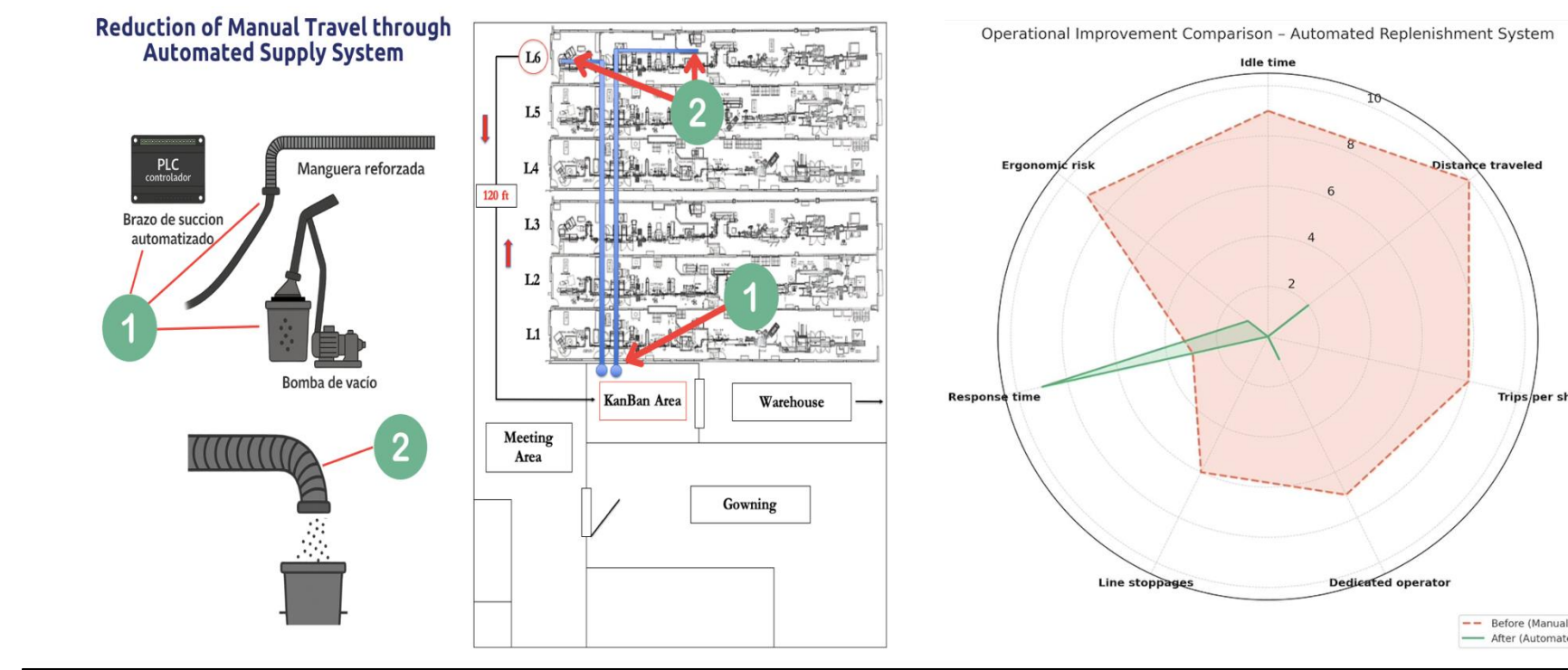
IMPROVE

Proposed Layout "In-process"



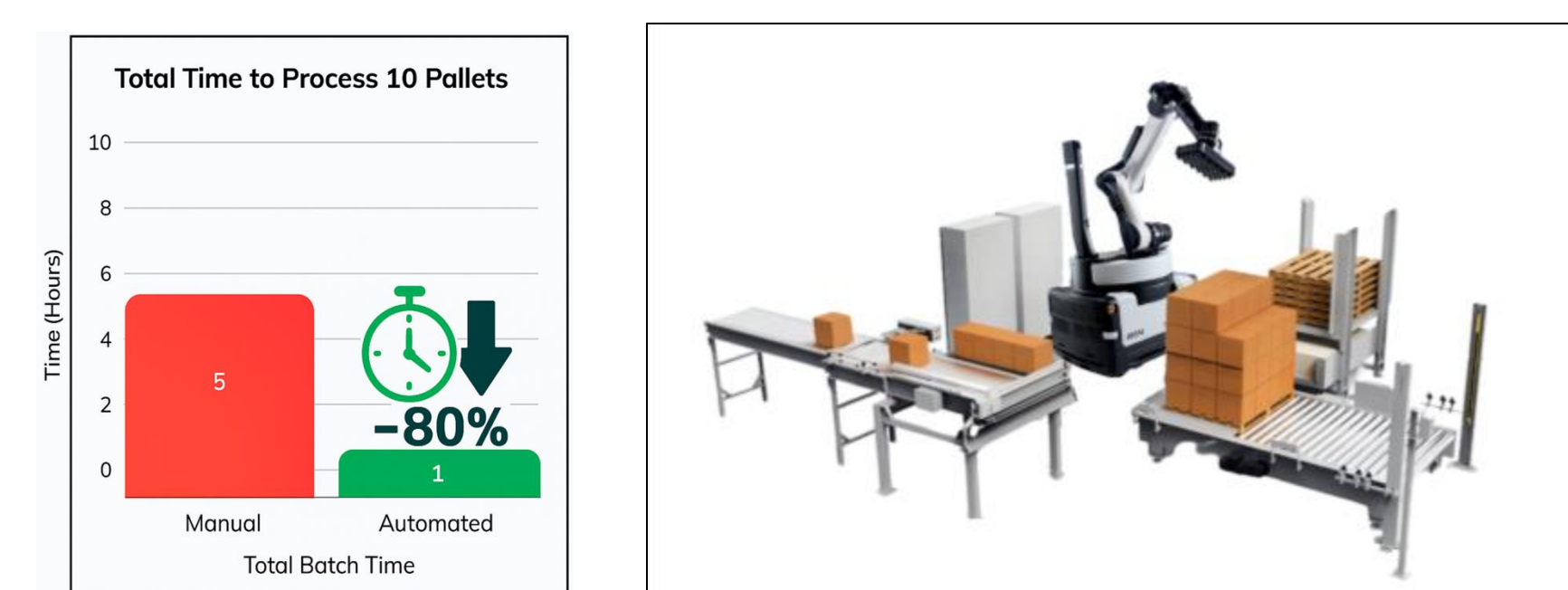
The proposed in-process layout introduces a bacterial isolator door with an interlocking system to streamline operator movement during inspections and reduce travel between key areas. This modification significantly shortens travel distances and standard times, improving overall efficiency while maintaining regulatory compliance. The new layout reduces total travel distance by 22.5% and standard travel time by 31%, increasing useful available time and supporting a more efficient inspection process.

Proposed Layout "In-service"



This system, controlled by a PLC, ensures continuous, hands-free transport of components like bottles and caps, enhancing workflow. The design aligns with GMP standards by minimizing human interaction, supporting unidirectional flow, maintaining area segregation, and reinforcing traceability and hygiene. It also meets FDA requirements by ensuring proper equipment design, contamination control, and ease of cleaning.

Proposed AVG



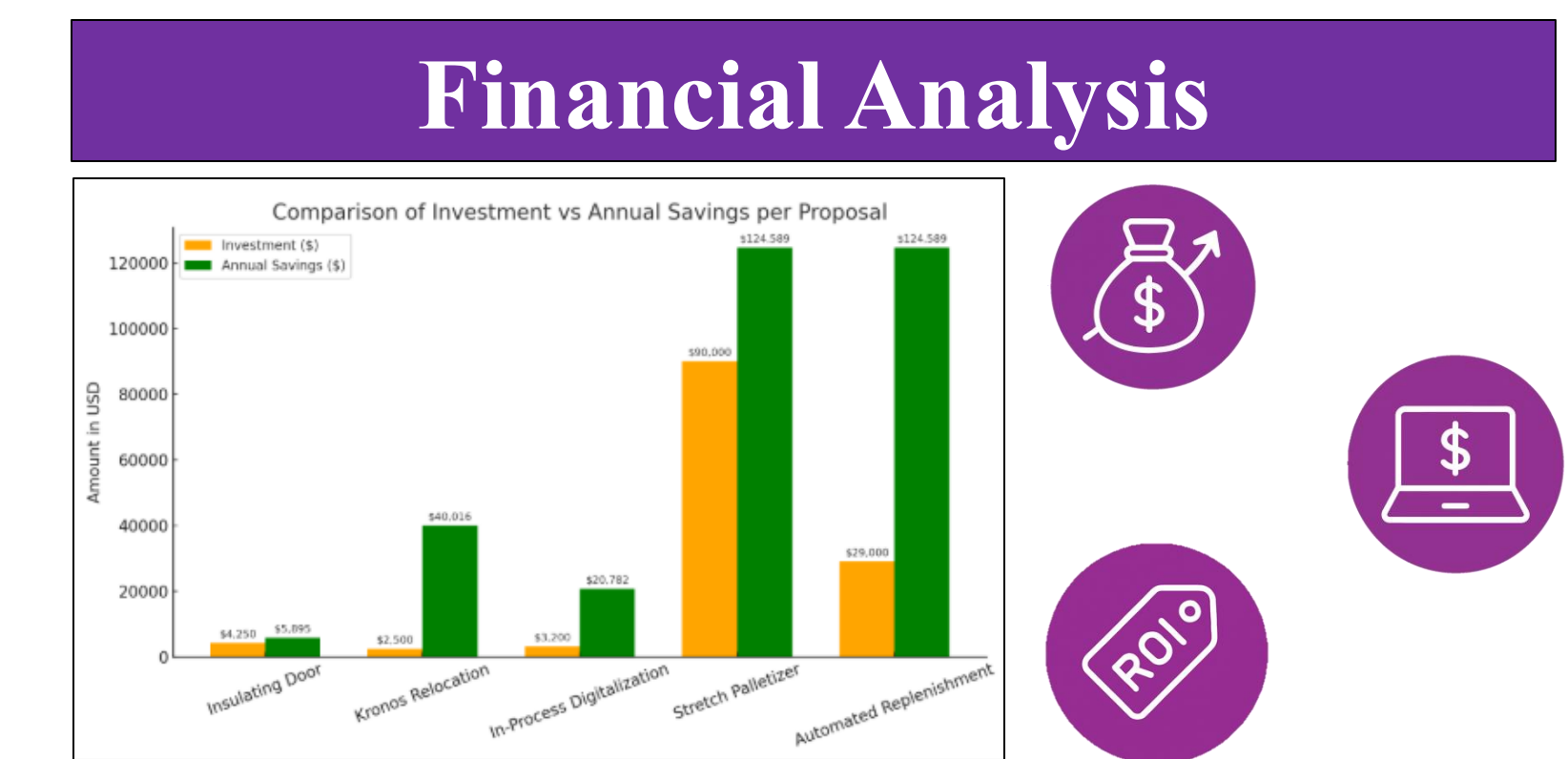
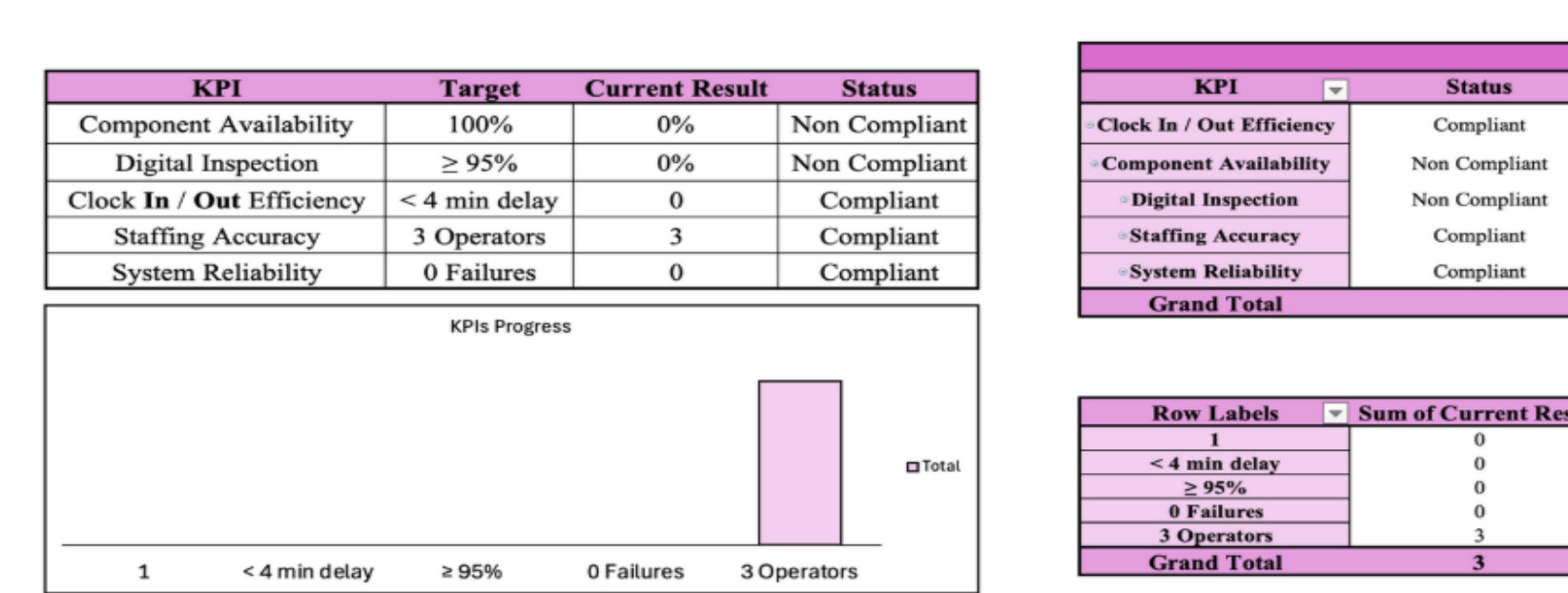
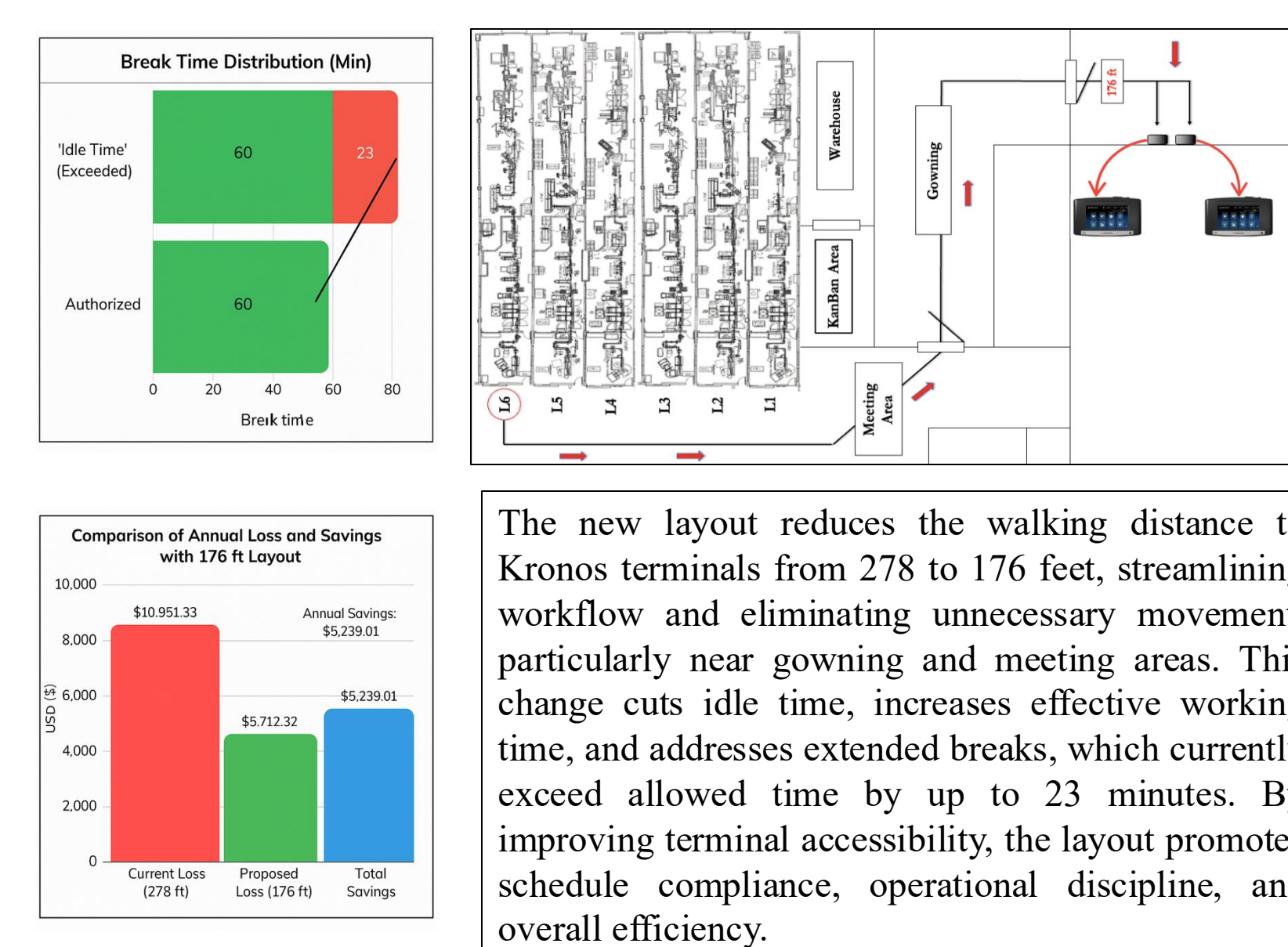
This automation enhances end-of-line efficiency by eliminating manual lifting, repetitive movements, and inconsistent stacking. While current manual palletizing requires around 5 hours and multiple operators to process 10 pallets, Stretch can complete the same task in just 1 hour, resulting in an 80% reduction in operational time and significantly lowering the risk of physical strain and injuries for workers.

ONU Goals

- 8 DECENT WORK AND ECONOMIC GROWTH:** Task redistribution and strategic placement of Kronos terminals reduce walking time and inspection workload, easing physical strain and promoting fairer, more efficient work—supporting SDG 8 goals of decent work and economic growth.
- 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE:** Aligned with SDG 9, automated palletizing with AGVs replaces manual stacking, saving 30 minutes of operator time and promoting smart manufacturing. This modernization supports workforce upskilling and resource reallocation, driving industrial innovation and resilience.
- 12 RESPONSIBLE CONSUMPTION AND PRODUCTION:** SDG 12 is supported by digitalizing manual inspections through tablet use, cutting inspection time by 2-3 minutes and eliminating paper waste. Real-time data and integrated software enhance decision-making, reduce setup time, and promote more sustainable, efficient production.

CONTROL

Proposed Kronos Layout



Conclusion

The project successfully achieved its objectives by implementing a series of targeted improvements that enhanced efficiency, compliance, and ergonomics. Personnel were effectively redistributed, with 25% assigned to new tasks, supporting a more balanced workflow. The inspection process was digitalized, and end-of-line operations were automated, cutting palletizing time by 80% and reducing manual strain. The in-process layout, featuring an interlocking bacterial isolator door and PLC-controlled transport, cut travel distance by 22.5% and standard time by 31%, optimizing movement while maintaining GMP and FDA compliance. Additionally, adjustments to the Kronos terminal layout reduced walking distance by 91 feet and cut idle time by 39%, significantly boosting operational discipline and productivity.

Acknowledgements

