

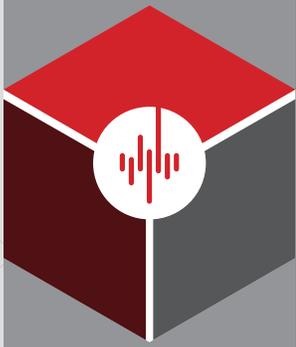
a WEPCO
Company

PULSE Presents:
OVERVIEW OF OUR COMPANY

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SECTION 01
About Us



Introducing PULSE, a WEPCO Company

WEPCO has been a systems integrator for over 45 years, founded in 1971. We have established ourselves as experts in robotic systems and technology, distinguishing ourselves by the teams we assemble and the solutions we deliver. WEPCO, along with PULSE, has the capability to scale our scope of delivery to fit the ever-changing requirements of your facility needs.

Why WEPCO Launched PULSE

The purpose of PULSE is to specifically help companies leverage the right mix of technology (digital and physical) in their facilities. Serving clients across the U.S., PULSE has ingrained Industry 4.0 Thinking into the design philosophy at every level to deliver agnostic, data-driven technology solutions that adapt to consumer supply and market changes.

As your partner and supplier, we will provide:

- Creative approach to problem solving
- Focused team on quality, efficiency, safety, and regulations
- Solutions that provide a winning ROI
- Strong, innovative, and experienced implementation team
- Experienced and efficient project management and engineering staff
- Highest quality hardware, software and controls
- An organization completely committed to customer satisfaction

Since 1971

Technology Neutral Solutions Provider

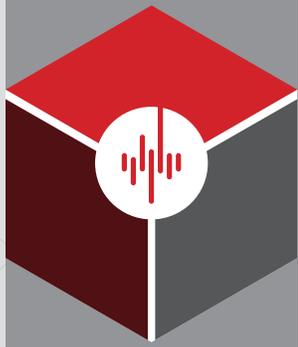
PULSE, headquartered in Pittston, PA, combines design expertise, seamless integration with intentional transparency to provide clients with scalable engineered solutions.

Markets

- eCommerce
- Pharmaceuticals
- Food & Beverage
- Industrial

Applications

- Manufacturing
- Distribution & Warehouse
- Production & Processing



SECTION 02
Our Approach

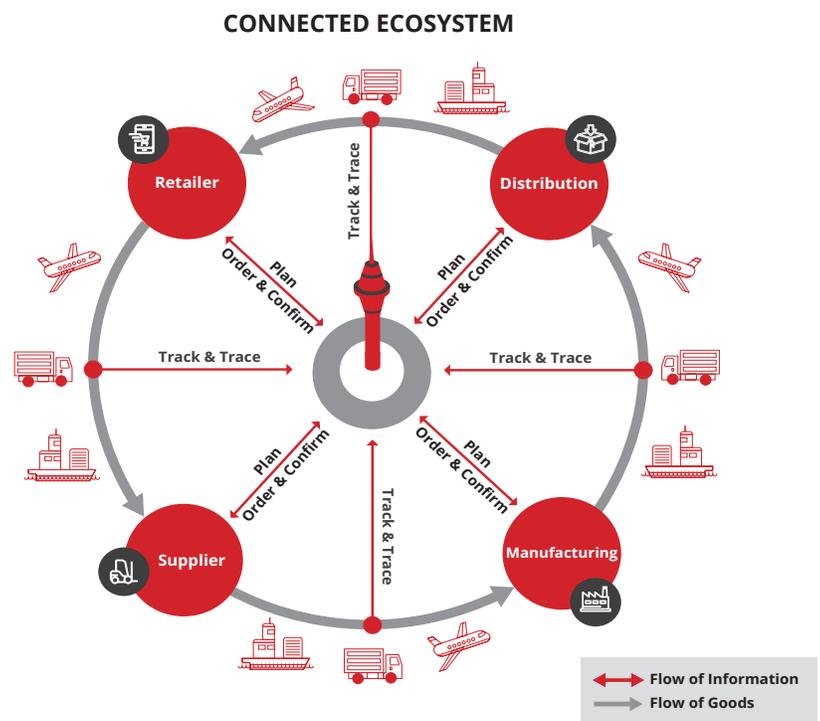
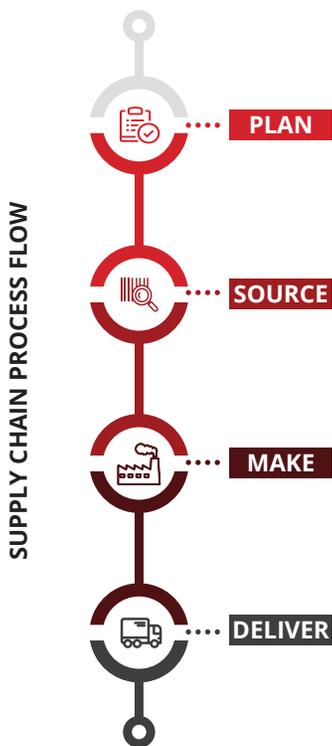


Our Philosophy

The world is changing. Unemployment rates are at an all-time low with rising transportation costs and driver shortages. Technology advances, big data and consumer expectations are driving the supply chain in real time through advanced demand signaling. As a result, supply chains are rapidly changing. The supply chain moves from a linear (plan, source, make, and deliver mode) in static steps to a matrix of connected partners, devices, information and consumers dynamically. These new challenges require a different approach to supply chain designs. Considering these influences, PULSE creates a different experience.

10 EXPERIENCES THAT SET US APART

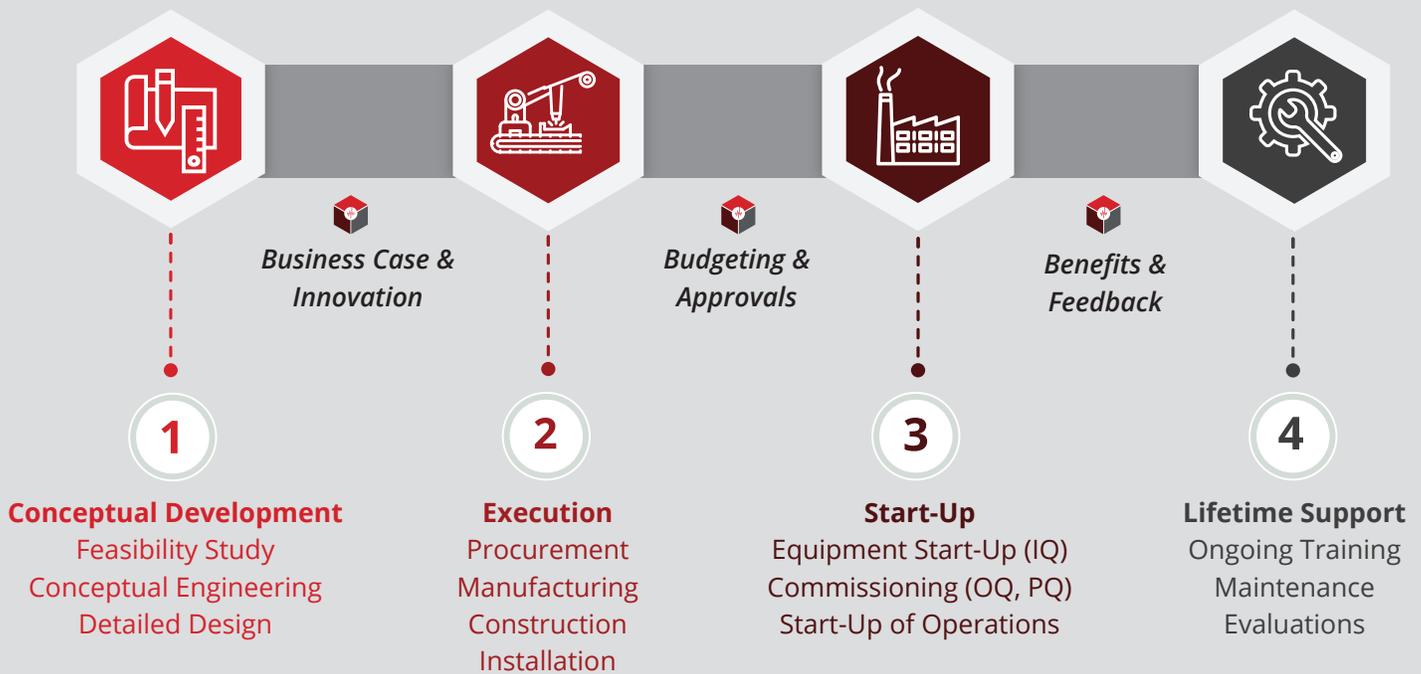
- | | | | |
|----|--|----|--|
| 01 | Listening to our clients' needs, understanding the business objectives | 06 | Capabilities in talent with years of experience |
| 02 | A practice of financial 'open book' transparency | 07 | Governance in strong program management |
| 03 | Creative design in an agnostic approach | 08 | Client service ready to support innovation and ongoing services |
| 04 | Experience in emerging technology applications | 09 | Agility in project management and design to meet client's changing needs |
| 05 | Ownership of controls and warehouse execution software | 10 | Seamless leadership that acts as an extension of your team |





Our Approach

As experts in systems and business, our process is completely open book to allow clients to understand, collaborate and analyze our agnostic engineered solutions in real-time. We are dedicated to the seamless delivery of each of these four (4) phases to ensure short and long-term success.

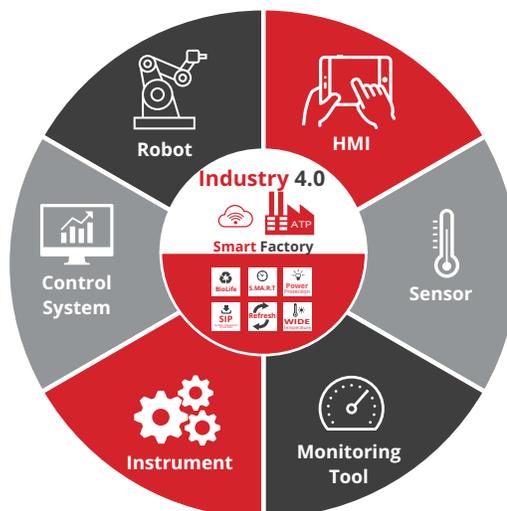


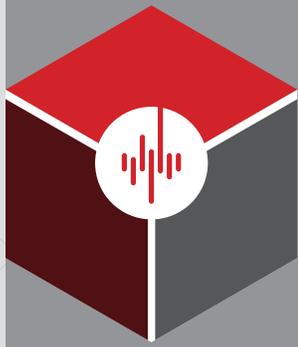
We ensure project alignment from Concept through Lifetime Support. Our culture is built on putting our clients first, remaining transparent strategic partners throughout the entire process.

Industry 4.0 Thinking

Industry 4.0 Thinking is ingrained in the PULSE design philosophy and includes analyzing the problem from multiple viewpoints:

- Flexibility
- Scalability
- Upgradeable
- Data Driven
- Intuitive Interfaces
- ROI Driven
- Transparency





SECTION 03
Our Capabilities



Our Capabilities

As partners, PULSE is an extension of your facility operations with the highest-level of attention to details. We align data-driven engineered solutions to your business objectives, goals and projections while maintaining an open book approach. It's more than just a project to us — it's a relationship.

What We Do



Strategic Partnerships

In system design, we analyze the value chain and select qualified vendors to bid on commodity portions, while aligning with strategic partners for essential components of the system.



Industry 4.0 Design Philosophy

Our software design includes Industry 4.0 thinking by enabling all systems to be ready for cloud computing, eCommerce website, and Internet of Things (IoT).



Transparent Process

From system analysis to implementation, we believe our clients should understand how and why our engineered solutions work.



Technology-Neutral Solutions

We are committed to providing the right solutions, not the popular solutions. Your equipment and software should be solely based on how well it fits and will work within your facility, not the name.

Services

- Data Collection & Analysis
- Design & Engineering
- Concept Generation
- Business Case Development
- Project Management & Engineering
- System Implementation
- Custom Design & Engineering
- Lifetime Services

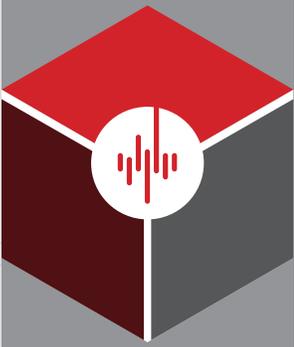
Technology

- Conveyor
- Robotics
- Palletizing
- Storage/Retrieval
- Horizontal Transport
- Mobile Robots
- Automated Guided Vehicles Systems (AGVs)
- Warehouse Control Systems (WCS)
- Warehouse Execution Systems (WES)

Consulting & Future

Experienced and tech-savvy in all things fulfillment, we use our real life expertise to deliver results. We work with companies across a variety of industries each with their own needs and challenges. We do not use a one size, fits all approach. Instead, we are invested in your success from the moment we meet. From strategy to selecting and installing innovative tech solutions, our focus is always on driving results that matter.





SECTION 04
Experience

Our Customers

Keeping our customers at the forefront helps us determine what project success really looks like, long before the first piece of equipment arrives on the job site. It's about relationships, innovation, efficiency, empowerment and learning. We work with our customers to uncover their expectations to reveal other risks, challenges and concerns that face them in the process of their capital investments. We serve a broad range of customers in various industries including consumer product goods, pharmaceutical, retail, automotive, and e-Commerce.

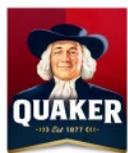


2017 Top Collaboration Award, Keurig Dr. Pepper

PULSE and WEPCO was awarded Keurig Green Mountain Top Collaboration Award for its transparency and open book approach that facilitated many solutions to Keurig's manufacturing and distribution facilities. Keurig is a leader in specialty coffee & innovative single serve brewing. This reinforces the client appreciation for PULSE core values.



A Thermo Fisher Scientific Brand





The Grocery Store of the Future

A massive wave of growth in online grocery is coming. In-store fulfillment for online orders won't scale and congested aisles and out-of-stocks will hurt all your customers and your margins. The better shopping experience will determine who owns the market.

Your physical store network may see as much as 30% attrition. Market share is being taken by e-commerce, convenience stores and new market entrants. The good news is there is a way to win:

Turn one of your stores into an omni-channel commerce hub.

Easily Integrated with an Existing Store

A Focus on ROI

Our integrated system is built around driving value by working within your existing store network.

Customer First

It addresses your customers' primary needs for speed and convenience without impacting any of the fresh departments that differentiate your brand.

Space Efficient

We're just replacing the maze of center aisles with a high density and fast moving storage and retrieval system.

Operationally Efficient

Back of the store "wareroom" re-allocates space for efficient manual fulfillment operations as well.

Additional Labor Savings

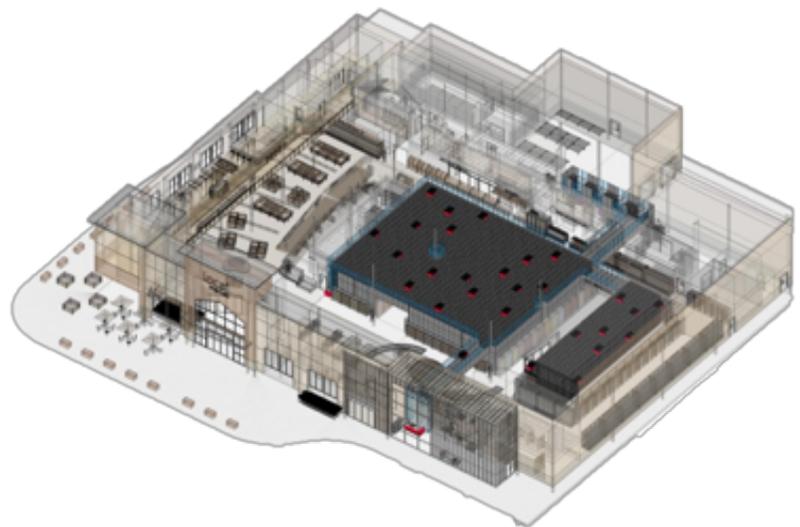
Given a large volume of sales through self service kiosks, you can operate with fewer checkout lanes for more labor savings.

Omni-Logistics

Supports pick-up for both in-store plus online customers as well as delivery for online customers.

Minimal Remodel Impact

Our system plugs into your existing center-store infrastructure minimizing operational disturbance during a remodel.



New In-Store Experience

In-store shoppers can quickly find popular items via large kiosks powered by locai's digital commerce platform.

Fast & Efficient

The AutoStore robotics fulfillment system delivers items fast, associates can pack an order in minutes.

Your Customers See You At Your Best!

Shoppers will enjoy your food service or shop fresh food items while their order is picked & packed.

Online Problem Solved

Online orders in the area are also fulfilled by the AutoStore System.



The Grocery Store of the Future

What it means for your customers:

Shop at Home

Truly Omni-channel. Your online customers can have the same selection and pricing as your in-store customers.

Enjoying your Fresh & Food Service Departments

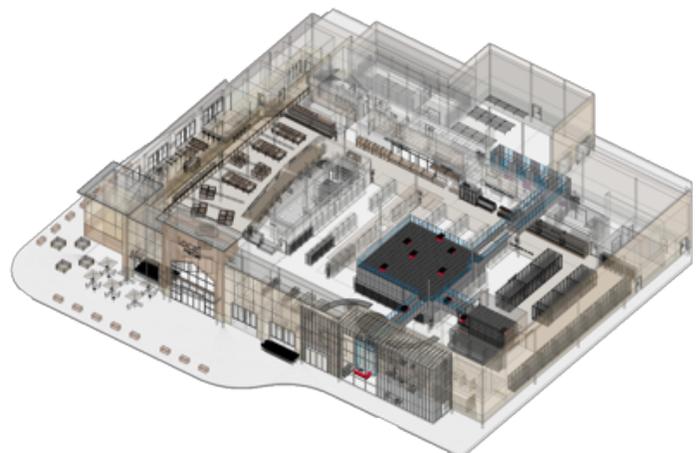
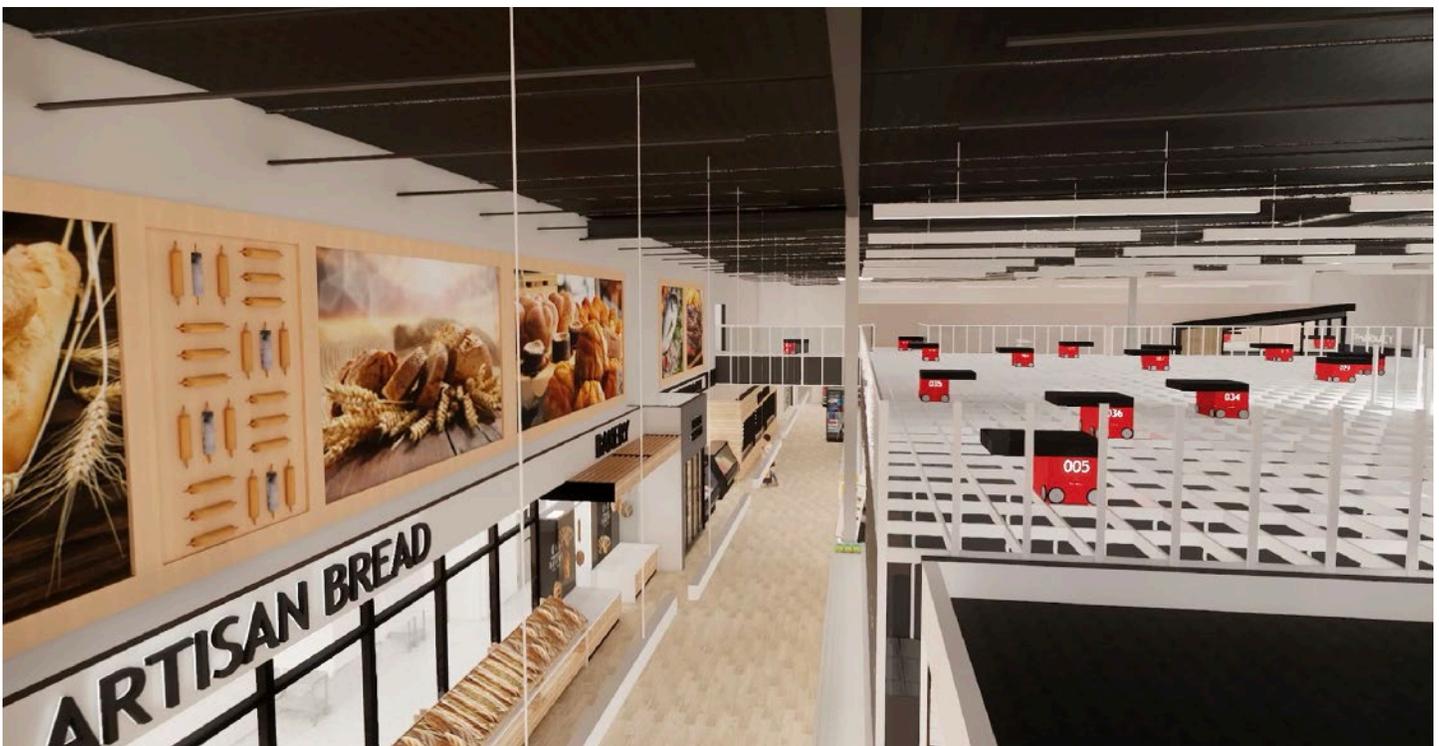
Putting your best foot forward in Produce, Bakery, Meat, Seafood, Deli & more

In-Store Mobile

Your customers can shop from your entire assortment and get all the valuable information they crave from their phone

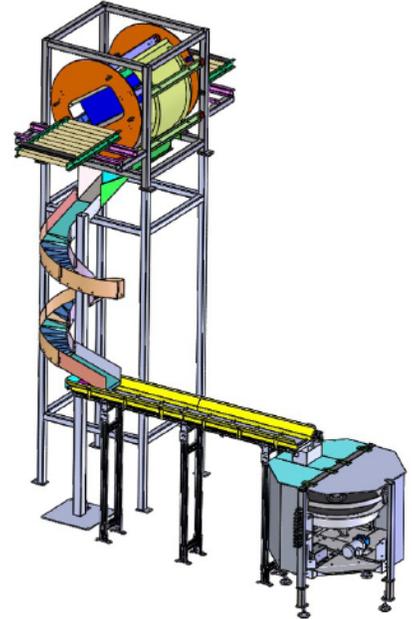
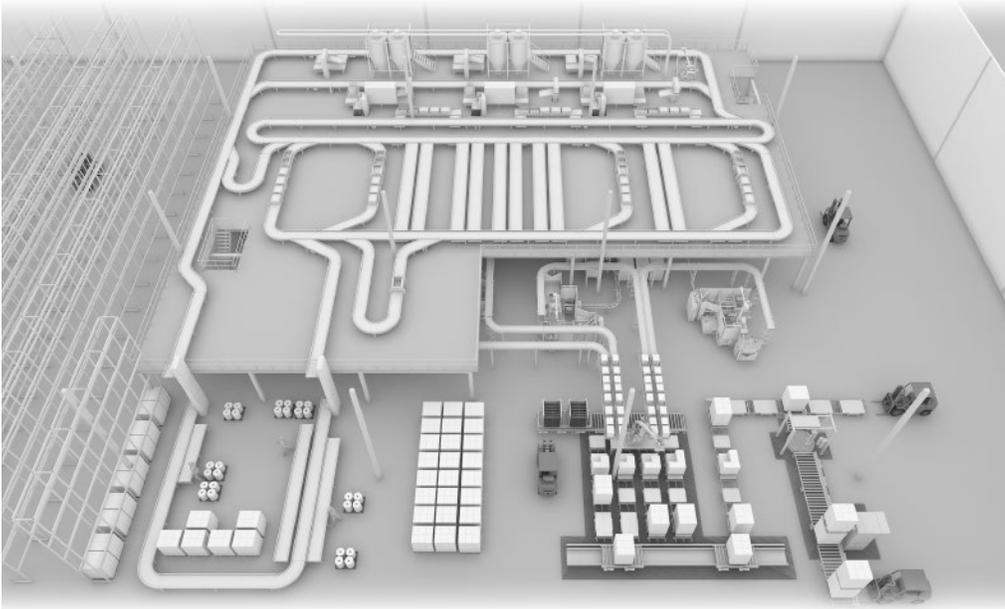
In-Store Kiosk

No more walking through a maze of aisles, the in-store kiosks put your center store at their finger tips.



Coffee Manufacturing

Sumner, WA



The Challenge

A coffee manufacturer needed a way to control the costs associated with filling tens of thousands of orders per day while lowering costs per pod, decreasing their labor force, and utilizing industry 4.0 thinking.

The Solution

PULSE devised an innovative solution implementing warehouse execution software, automated material handling, decoupling, automated RM handling, automated trash handling, and centralized palletizing to improve their costs, while decreasing their labor force.

Highlights of the Solution

PULSE installed (3) 400 cup/min fillers, (4) 400 cup/min packers, (1) centralized palletizer, (7) unique “decoupling” equipment centers, (6) coffee hoppers and chain-vey, 15,000 sq. ft. platform and 1,500 LF MDR Conveyor.

The Value

- Reduced cost per unit shipped
- Establish Labor savings
- Productivity Increase
- Ability to react in an efficient manner to dramatically increasing volumes
- PoP-Proof of Principle
- First Centralize Pallatizer
- First WES in manufacturing
- First D-coupling
- First RM Processing
- First Automated MHE



Wyeth Pharmaceuticals / Cold Chain Distribution

Great Valley, PA



The Challenge

Wyeth Pharmaceuticals needed to create a cold-chain distribution network for its FluMist influenza vaccine. The vaccine, delivered as a nasal spray mist (no-shot), must be frozen at the point of manufacture and kept at -22°F to remain stable. Because of strict regulatory requirements, Wyeth could not use existing distribution chain applications not even ice cream storage. They needed a fail-safe operation that could receive trucks loaded with pallets of frozen vaccine and keep them at -22deg;F through depalletizing, pick/pack, manifesting, and reloading for shipment to doctors' offices and pharmacies throughout the country.

The Solution

The most advanced cold-chain distribution operation in the world. Wyeth hired PULSE to design and implement many of the systems used to solve the FluMist problem. PULSE tested prototypes in its own facility, and then drew up floor plans that the 86,000 square foot center was built around. Much of the equipment had to be custom designed to ensure that the vaccine was never exposed to ambient temperatures, including a freezer dock door system, conveyors to transport pallets of the vaccine through freezer tunnels, and robots dressed in space-age parkas to keep them warm enough to function well.

“The team was the material handling design and system integration firm we used for our FluMist cold-chain DC in Louisville. We also have several pending projects with them in our Knoxville DC. There are a multitude of design firms out there with varying levels of expertise...we have had great experiences with WEPCO and if you are looking for a qualified firm then I would suggest them...” ~James Cofone, Sr. Director Distribution, Wyeth Pharmaceuticals

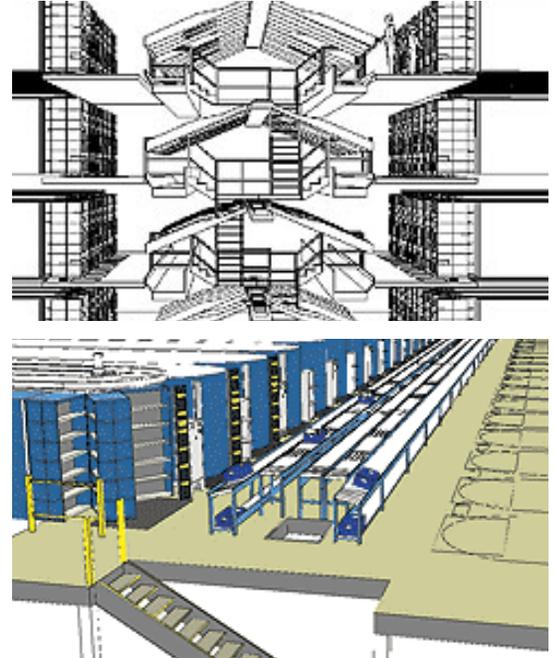
A huge challenge was how to keep humans out of the harsh cold-storage environment, so most of the process was automated. When human interaction was required, eight custom-designed airlocks were constructed so workers in a 65deg;F pick/pack room could have access to the cases of FluMist. Dennis Gniadzowski, FluMist distribution center project director, explained, We have less than 90 seconds to complete the pack-out process, including picking the doses, packing them in a special expanded polystyrene (EPS) foam shipping box with dry ice and dunnage, and sealing the lid. All of the steps are automatically measured by timers, scales, photo eyes and bar-code scanners so we can monitor the process for compliance.

To protect from catastrophic loss of the DC's entire inventory, PULSE built in redundant equipment at all phases of the operation. That included double conveyor lines, double freezers, double picking zones, double material handling equipment, and two separate electric power feeds from two different substations. Although this drove up construction costs, the value of the inventory justified the investment.



Zappos.com / Online Footwear Retailer

Shepherdsville, KY



The Challenge

Zappos needed a way to control the costs associated with filling tens of thousands of orders per day in a direct-to-consumer environment.

The Solution

PULSE and Diamond Phoenix designed and integrated an order fulfillment system that includes the largest horizontal carousel system ever built, measured in cubic feet of storage space.

The Benefits

- Reduced cost per unit shipped
- Reduced cost/cubic foot of storage
- Productivity increase
- Ability to react in an efficient manner to dramatically increasing volumes

The Numbers

120 carousels x 6,300 cubic feet each = 756,000 cubic feet of storage.

The Innovations

A series of major innovations across all elements of the carousel system mechanics, controls and software.

“We believe the innovations developed for this application set the stage for implementing carousel technology, easily and cost effectively, in a variety of new industries, including apparel and footwear. The cost per cubic foot of storage has been reduced by up to 40%, allowing productivity increases to significantly improve ROI for our clients.” ~Tom Coyne, CEO of Diamond Phoenix



Utz Quality Foods / Snack Food Quality Control Kindig Lane Facility

Hanover, PA



“We are looking for foreign objects, missing product, seasoning conglomerates, and incorrect weights ... Our food safety goal is to X-ray every product. This has been a huge help.”
~Jeff Fuhrman, VP of Engineering, Utz Quality Foods

The Challenge

The solution was not without its challenges. In addition to straightforward cases of bagged product, various sizes of plastic jugs containing cheese balls and snack mix had to be conveyed to the X-ray system via Hytrol roller conveyor. Some jugs were tall, skinny or oddly shaped, making them unstable. The team chose to use NEDCO table-top conveyors similar to those used in bottling operations to transport the jugs securely through the X-ray machine to the palletizing operation.

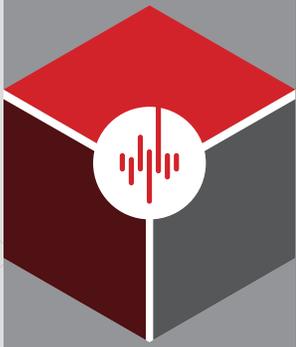
The Solution

PULSE and Hytrol Conveyor Company, equipment suppliers, and the customer, devised the solution using new X-ray detection and innovative automation technology. The system, installed summer 2010, conveys finished cartons through an X-ray system which detects the proper product weight and quantity of each SKU. The X-ray step improves both food safety and product quality.

The Innovations & Benefits

The team is known for its innovative way of solving material handling challenges. Working with Hytrol, they devised a way to not only solve Utz's food safety problem and improve product quality, but also streamline operations, free up DC floor space, and improve productivity.

The team innovative thinking also significantly improved productivity in the Utz facility. Previously, product was cased and palletized at the end of each packaging line, then transported out to the warehouse. Now, cases (or individual jugs) are transported by conveyor to a central palletizing operation located just after the X-ray machines in the warehouse. It was this kind of inventive thinking that originally convinced Utz to award the contract to the team.



SECTION 05
Leadership

Our Leadership



Christopher Paulsen

Chief Executive Officer

35+ of years experience

About Chris

- Responsible for the development and execution of the companies overall sales strategy as well as performing as “Executive in charge” of major program efforts.
- Focused on the interest of the success and well-being of employees and customers.
- Maintains overall awareness of both the external and internal competitive landscape, opportunities for expansion, customers, markets, new industry developments and standards within the material handling industry.



Larry Strayhorn

President

40+ of years experience

About Larry

- Responsible for creating, planning, implementing, and integrating the strategic direction of WEPCO and PULSE including responsibility for all components and departments.
- Held major positions at some of the largest system integration companies in our industry.
- Brings a wealth of knowledge and relationships with a particular expertise in highly automated order fulfillment.
- Held the Chairmanship position in the Automated Storage and Retrieval and Automated Guided Vehicle production sectors. Led MHI Order Fulfillment and Integrated Systems Councils.
- Serves on the Industry Leaders Roundtable of MHI, and the Board of Governors of MHI where he recently served as the Chairman of the Board.

Our Leadership



Jack Bonanno

Chief Operating Officer

32+ of years experience

About Jack

- Corporate executive who oversees ongoing business operations within the company.
- Responsible for designing long term strategies and organizational change to the benefit of shareholders and business objectives.
- Experience in delivering consumer centric supply chain maturity in Retail and CPG.
- Expertise in Network Modeling, Capacity Management, Omnichannel Retailing, Logistics Operations, and MHE Automation/ Design.



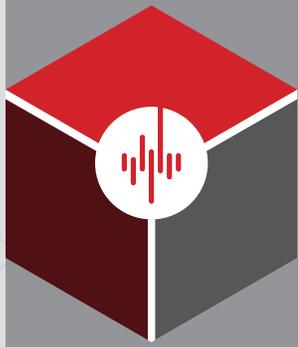
Brittain Ladd

Chief Marketing Officer

20+ of years experience

About Brittain

- Former Deloitte and Capgemini consultant focused on strategy, supply chain and logistics consulting for companies in retail, CPG, oil and gas, chemicals and manufacturing.
- Designed strategies for Amazon & has become a 3PL and a leader in groceries.
- Written articles for Forbes, Observer, Bloomberg, and numerous industry publications.
- Appeared on CNN, Fox Business, the BBC and other cable news programs globally. Ranked as one of the leading voices on LinkedIn.
- Passionate about solving complex business problems and designing innovative technology and strategies that reduce costs and complexity while creating a competitive advantage.
- Expertise in supply chain management, technology, robotics and micro-fulfillment.



SECTION 06

**Partnership &
MHE Technologies**



PULSE.exe

Our business is warehouse control systems. Over the years we have earned a reputation for innovation, reliability, and solid methodology. We collaborate with the best minds in the industry to ensure that our robust solutions optimize the customer's operation within their dynamic business environment. We have a track record of success in managing both simple and large, complex systems.

Fine Tuning the Warehouse

Our Warehouse Control System, PULSE.exe, an integration tool, provides operational insight and performance optimization throughout the supply chain. It is a flexible, tightly integrated system that has advanced management capabilities for inventory control, resource scheduling and order management. It is modular in nature, easily configurable, and platform independent to easily adapt to the customer's current and future needs.

PULSE.exe

PULSE.exe is a modular suite of software products that encompasses all of the tools necessary to efficiently and economically operate a warehouse or distribution center. PULSE software consists of the following five modules. Customers can select only the modules needed, and have the flexibility to add modules as their business grows:

- ***Inventory Management System (IMS)***[™] - A state-of-the-art technology to enhance the accuracy and efficiency of warehouse operations and data integrity. IMS[™] maintains optimum inventory levels and accurately tracks inventory throughout multiple warehouses.
- ***Order Management System (OMS)***[™] - This provides the functionality necessary to properly and efficiently execute the order fulfillment process. This module facilitates the planning, processing, verifying, and shipping of orders within the warehouse or distribution center.
- ***Shipment Management System (SMS)***[™] - A software tool that provides reliable parcel and LTL shipment manifesting. Powered by ConnectShip[™], SMS[™] offers customized shipping solutions to streamline shipping and order fulfillment processes based on the customer's best practices.
- ***Navigator***[™] - This module is the focal point for managing the operational aspects of the material handling system. It optimizes the routing of orders on the conveyor system. This module coordinates real-time control devices to efficiently manage the workload.
- ***Toolkit***[™] - This is a multi-purpose module which assists operators and managers to work in a proactive rather than reactive environment, ensuring quality throughput and on-time delivery. This application provides diagnostic and reporting tools to monitor system and operational performance.

Warehouse Control System (WCS)

WCS acts like a conductor in an orchestra, ensuring that individual pieces of material handling equipment perform with harmony, precision, and efficiency.

Warehouse Execution System (WES)

WES is the middleware between an ERP/WMS and the resources necessary to perform the various tasks. These resources include workers as well as MHE automation. The WES communicates with resources to collect information and direct work efforts such as Fulfillment, Replenishment, & Shipping.

Warehouse Management System (WMS)

WMS is a software application, designed to support and optimize warehouse functionality and distribution center management. These systems facilitate management in their daily planning, organizing, staffing, directing, and controlling the utilization of available resources and inventory to move and store materials into, within, and out of a warehouse.



Partnership

PULSE has extensive experience providing material handling and systems integration in the manufacturing, distribution and warehouse, and production and processing industries. We have experience in implementing fully automated large scales systems and lower technology traditional solutions with full Warehouse Management Systems (WMS), Warehouse Execution Systems (WES), and Warehouse Control Systems (WCS). The following represents a sample of companies we formed partnerships in the industry.

AutoStore

Ultra Dense Storage Solutions

AutoStore is the cube storage pioneer reducing storage footprint by 75% when compared to other storage solutions. AutoStore eliminates walkways and shelving and utilizes the highest density ratio cube storage of any goods-to-person system. Number-identified bins are stacked high and compactly in an aluminum cubic grid system that can be built around columns or pillars to accommodate user access. AutoStore delivers ultra-dense scalable storage solutions.



AutoStore Services

- Ultra-Dense Storage and Retrieval (or Ultra-High Storage Density)
- Future Proof: Modular and Easily Expandable
- Green Technology: Lower Power Consumption
- Increased Productivity and Accuracy
- Expand storage footprint 4 times without moving
- Remove Racks. Remove Aisles. Remove Error.

Cuhaci & Peterson

Architects • Engineers • Planners

Cuhaci & Peterson is a national architecture, engineering and planning firm specializing in end-to-end commercial design solutions. Headquartered in Orlando, Florida since 1978, the firm also has offices in Philadelphia and Boston and is licensed in 49 states. C&P's mission of transforming ideas into value is enhanced by a staff of experts who collaborate with clients to translate their visions into designs that elevate their brands. For more information go to www.c-p.com.



Cuhaci & Peterson Services

- Prototype design and maintenance
- Ground up and tenant interior
- Remodels and renovations
- Store planning
- Food service design
- Refrigeration design

PET Terra Systems (PTS)

Process Engineering & Project Management

PTS is a facility engineering and project management firm with over 30 engineers delivering process and utility solutions to some of the largest packaging and beverage companies in the world. Employee-owned company with exceptional reputation for reliability, quality of work, schedule performance and budget performance.



PTS Services

- Conceptual Design
- Process Systems
- Utility Systems
- Power Distribution
- Control Systems
- System Audits
- Feasibility Studies
- Scope & Budget Development



Partnership Continued

locai Solutions

intelligent end-to-end eGrocery

Founded in 2018 by eGrocery veterans from FreshDirect and Peapod, locai offers extensible and configurable eCommerce SaaS solutions for grocers. locai's mission is to enable grocers to strengthen their customer relationships through engaging omni-channel experiences that engender greater loyalty, and to do so in a way that enables grocers to profitably scale online. locai's software suite includes an engaging eCommerce site configurable to the retailer's brand, a personalized meal planning application that can easily be integrated into any eCommerce site, an Endless Aisle application to expand a grocer's assortment, plus a fulfillment application for use in-store or distribution centers. For more information visit: [https:// www.locaisolutions.com/](https://www.locaisolutions.com/)



locai Services

- Pick & Pack
- Order Verification & Exceptions
- Intelligent Tote & Cart Building Logic
- Inventory Management
- Optimized Logistics
- Real Time Operating Metrics
- Turnkey eCommerce platform
- Endless Aisles marketplace
- Flexible integration
- Machine learning and AI

RAFT AS/RS

Fully Automated Pallet Shuttle

Fully automated, high-density pallet storage to meet today's demanding warehousing and distribution needs. RAFT is scalable for any high-throughput operation and it's flexible, allowing you to automatically react to inventory and order processing changes. RAFT AS/RS shuttles pallets via putwall or conveyor intake and swiftly navigates inventory storage and order fulfillment through the integration of cutting-edge automation and PULSE.exe.



RAFT Services

- Fully Automated
- Maximize Capacity
- Optimize material flow & order throughput
- Complete visibility of completed vs. in-process orders
- Reduction in labor & overhead costs
- Flexible & scalable – option to fully integrate with AGVs
- Minimized warehouse carbon footprint

Tompkins Associates

Distribution & Optimization

Tompkins Robotics, a business unit of Tompkins International, is a leading provider of autonomous mobile robot (AMR) solutions. The company has developed and deployed the world's first, portable automated sortation system, t-Sort, a revolutionary unit and parcel sortation system that is patented for North America and Europe. This new and innovative robotic technology helps build world-class supply chains while providing unmatched flexibility and throughput.



Tompkins Services

- Maximum Efficiency
- Space Utilization
- Labor Productivity
- Complete Modularity
- Ultimate Flexibility



Partnership Continued

Precision Distributing Consulting (PDC)

Distribution & Network Optimization Solutions

PDC is an independent logistics and warehouse design firm, founded in 1985, PDC specialize in tailored, warehouse and engineered solutions for over 600 clients in 31 countries, PDC top to bottom services are making a significant impact not only on each company's productivity, but on their overall competitive advantage.



PDC Services

- Network Optimization
- Delivery Optimization/Site Modeling
- Operations Assessment
- Computer Simulation
- Warehouse Layout and Slotting
- Facility Sizing and Design
- Performance Specifications

CRB

Architecture & Engineering Facilities

CRB is a global design, construction, and consulting firm with a team of more than 1,000 passionate professionals throughout the world. CRB delivers in all areas of project execution, from strategic planning and initial project programming, through conceptual and detailed design and into construction.



CRB Services

- Facility Programming
- Utility/Sustainability Analysis
- 3D Modeling
- Data Centric Documentation
- Architectural/Structural
- Mechanical/Electrical/Process
- Piping Isometrics
- Capital Planning
- Facility Evaluations



Material Handling Equipment Technologies

With good mechanical engineering, hardware and equipment can be mixed from various original equipment manufacturers (OEMs) to create a robust and efficient manufacturing or distribution system. The equipment component of our designs is often the easiest for teams to grasp, because of its tangible nature. We employ a best-in-class approach to equipment selection, where we stay constantly immersed in the latest technology. We have established relationships with OEMs that have the best reputations in the industry for value and durability.

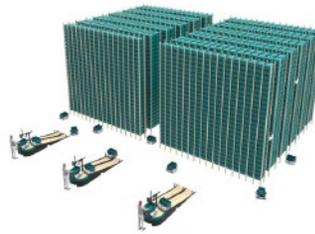
Goods-to-Person



Horizontal Carousels



Aisle Shuttle



Autonomous Shuttle



Grid Shuttle

Automated Pallet Storage and Retrieval



Pallet Shuttle



ASRS Cranes



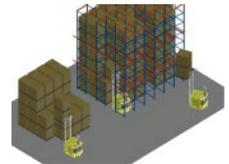
Pallet Runner



Unit Load AMRs



Picking AMRs



AGVs

Autonomous Vehicles

Robotic Palletizing



Full Pallet



Layer Picking



Mixed SKU



Fulfillment Automation Feasibility Case Study

Before deciding to proceed with a full system design effort, a high-level feasibility assessment should be performed. The following example illustrates how PULSE approaches this phase of a project.

Overview

Current Volume	
Number of active SKUs	600
Pieces (pcs) per year	33,476,000
Orders per year	565,600
Avg pcs per order	59
Avg orders per day	2,400
Avg orders per shift	800
Peak orders per shift	988
Picking Labor	
FTEs per shift	7
Pcs per hr per FTE	114

One of North America's largest garage door manufacturers operates two manufacturing plants and 50 distribution centers throughout the United States and Canada. At their largest manufacturing facility which is 900,000 sq.ft., it's a single level carton flow pick line which is used to pick all of the accessories and small parts kits needed for assembly in the field. The pick line is a simple pick and pass line with pick-to-light. The light system will fall out of support in approximately 18 months, so the company is looking for opportunities to reduce labor and be more efficient instead of just replacing the light system. The current operational statistics are shown in the table to the right.

Based on our experience, a fulfillment operation with an output of at least 1,000 orders per day that operates at least two shifts, is a candidate for an automated solution. More specifically, a goods-to-person (GTP) picking system. A GTP system (by definition) brings the product to the operator instead of the operators traveling to the product. GTP systems also facilitate a batch picking process which further reduces the time to fulfill the orders.

Based on the SKU count and order profile, a GTP system with 2 operators could handle the current volume. This is based on a very conservative rate estimate of 500 pc/hr/ FTE. This equates to the operators making 250 picks per hr. with an average qty of 2 items per pick. As a frame of reference, the average GTP system can present the source totes at a rate of 400 per hour per pick station. That gives the operator about 9 mins to complete each pick. The table at the left shows the projected cost savings from reducing the staffing per shift by 5 FTEs.

New Goods-to-Person (GTP) System Labor	
Design rate (pcs/hr/FTE/shift)	500
FTEs required avg	1.6
FTEs required peak	2.0
Labor savings per shift (FTEs)	5.0
Labor savings per day (FTEs)	15
Labor cost/FTE/yr	\$50,000
Total Labor Savings Per Year	\$753,700
Solution Budget for 2-yr Payback	\$1,507,400



Assuming that the customer agrees that implementing the GTP system has a good business case, the next steps would be as follows:

Step 1

Analyze a full year's worth of order data to develop accurate SKU and order profiles, daily, weekly, quarterly, and, annual order volumes.

Step 2

Review the data analysis with the customer to make sure the results represents an accurate picture of the current business. Apply any growth factors specified by the customer.

Step 3

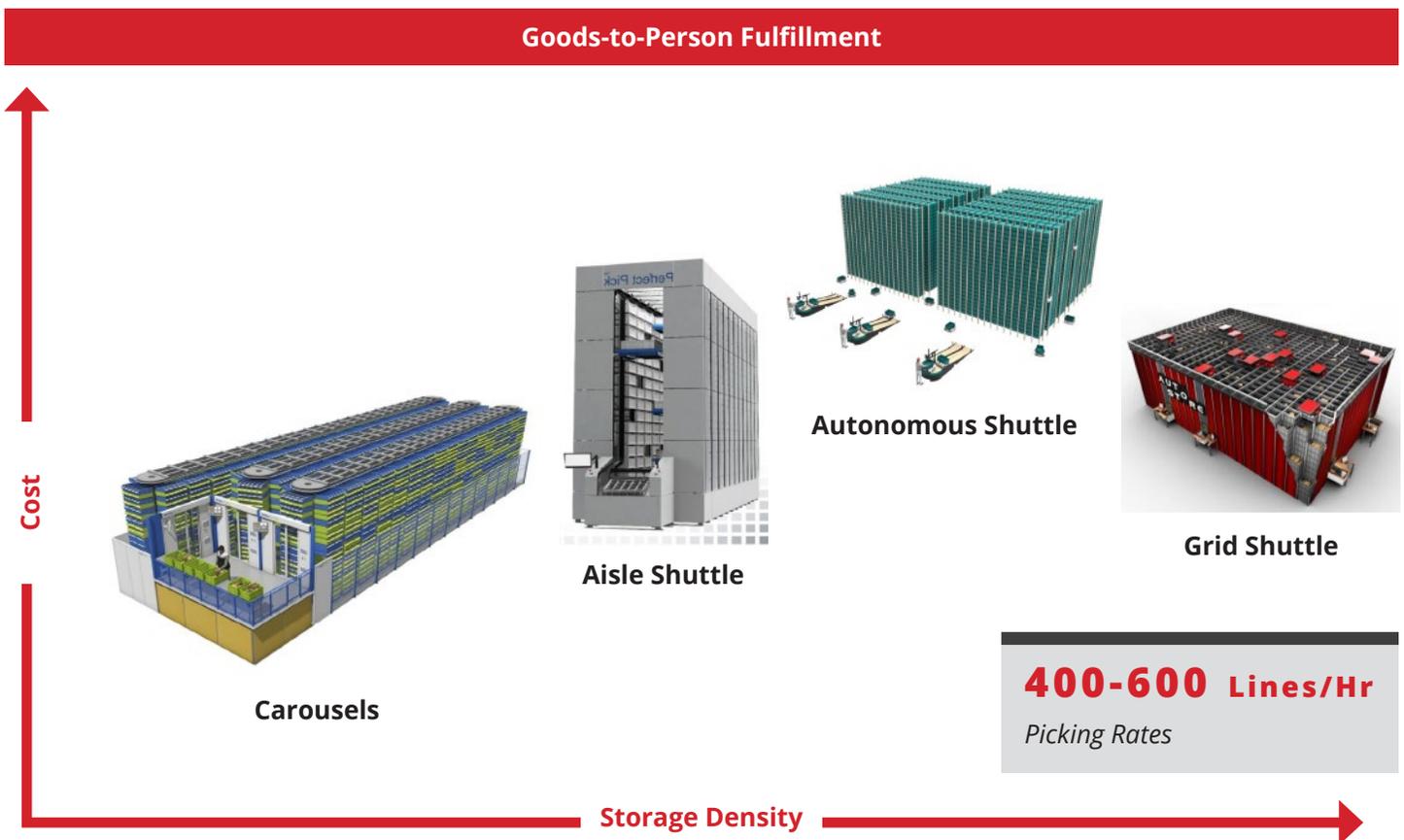
Use the results of step 1 & 2 to develop a GTP system specification that will be used to bid out several GTP systems. The chart below shows the range of GTP solutions that will be considered based on the throughput, space, and budget considerations.

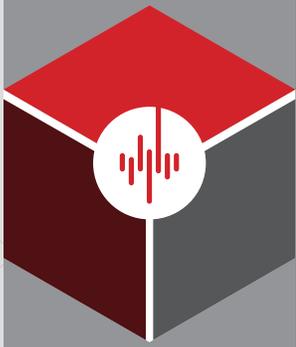
Step 4

Present to the customer results of GTP system bid out along with selection recommendations. Report includes a decision matrix comparing turnkey system pricing details, system specifications, space requirements, implementation schedule, operational and support labor requirements.

Step 5

Assuming the customer decides to proceed, the next phases are Final Design, Contracting, and Implementation.





07

LifeTime Services

LifeTime Services

PULSE LifeTime Services exists to serve as a valued extension of your team to assure you meet your system uptime and performance goals. We provide you with comprehensive, yet economical, service and support programs that are uniquely tailored to meet your exact needs and budgeted at flat monthly rates that are predictable and affordable.

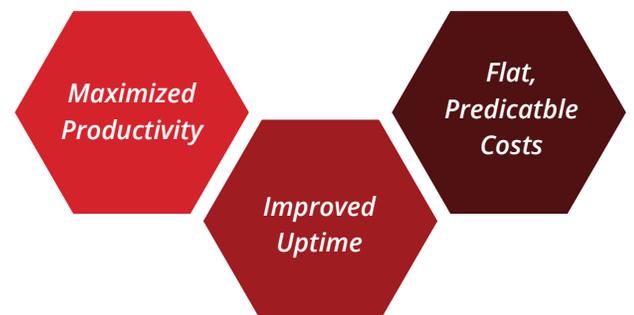


These services include:

	Inspections and preventative maintenance
	System operations
	24/7 live answer remote support and service
	Modernization and rebuild programs
	Parts management, ordering, and warranty servicing
	Operator and maintenance team training
	Emergency dispatch services

Typical solutions we deploy, service, and support include:

- Conveyor and sorter systems
- AS/RS and high-density storage solutions
- Automated palletizing, stacking and wrapping
- Autonomous mobile robots and self-driving industrial vehicles
- Industrial controls and software solutions
- Picking, shipping and receiving solutions
- Storage and structures





Headquarters

Pittston, Pennsylvania

Office Locations

- | | |
|---------------|---|
| Colorado | North Carolina |
| Florida | Ohio |
| Indiana | Pennsylvania** |
| Massachusetts | South Carolina |
| Michigan* | Utah |
| New Jersey | Vermont |
| New York | <i>*AMR Center of Excellence</i> |
| | <i>**AutoStore Center of Excellence</i> |

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