FALCON AUTOTECH

NEO

An ASRS that everyone can own

The growth of modern retail- both online and offline, has exerted an unprecedented set of challenges on Order Fulfilment Supply chains. Delivery time expectations are shorter than ever, availability of skilled labour continues to decline, rentals for warehousing continue to rise, and the need to offer more and more SKUs is at an all-time high.

All these challenges make the consistent and reliable running of order fulfilment operations in a manual setup an almost impossible task, irrespective of the size of the operations.

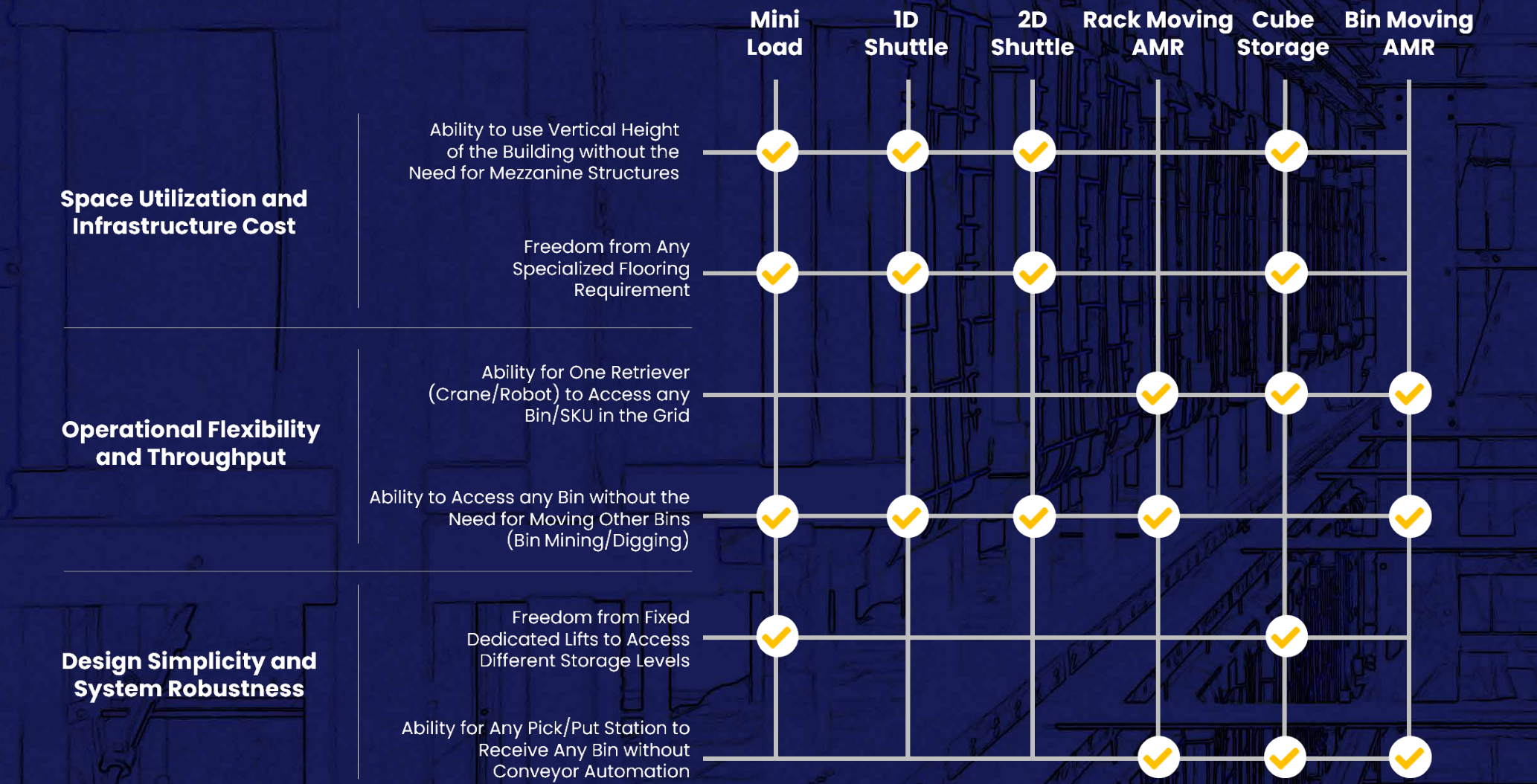
Companies across the globe have realized this trend, leading to a much higher degree of interest in Bin based ASRS systems/ Goods to person Systems worldwide. Some notable technologies available in this space are - traditional Mini Load ASRS, 1D and 2D Carton Shuttles, Rack Lifting AMRs, Bin Moving AMRs and Cube Storage Systems.

However, even after several years, the wide-scale adoption of these technologies continues to be astonishingly low. While some of these technologies have witnessed more success than others, the overall low penetration of these systems into the manually run Order Fulfilment market begs a critical question to be answered -

Why is this so?

At Falcon Autotech, our experts have been battling this question and researching for the answer for many years now.

After speaking with many leading brands across E-commerce, Fashion distribution, Grocery distribution, 3PLs, Spare Part Distribution and FMCG distribution, we believe that the answer lies deep in the inherent design philosophy of these technologies.



Most of these technologies were developed multiple decades ago to cater to the ASRS applications relevant at that time. While some of these have been repurposed/ modernized in recent times, at their core, these age-old technologies were never designed, considering the challenges and requirements of the modern day and age.

Therefore, it is safe to conclude that the available solutions today struggle to offer customers a perfect balance of Scalability, Reliability, Simplicity, Flexibility and Affordability, and this has led to a much slower-than-needed disruption in this space.

Way back in 2017, the R&D **Engineering team at Falcon Autotech** embarked on their journey to solve this mega problem and develop a technology that could truly eliminate all these barriers in the adoption of Bin Based ASRS/ GTP on a widescale international level. Their mission statement was simple- make a system that competes head-on with the manual order fulfilment industry rather than competing with the technologies listed earlier.

To achieve this improbable goal, they had to take a completely fresh view of the problem statement and develop something revolutionary- not just in concept but in design and execution. After undergoing seven iterations since the inception of this dream project, we are happy to introduce it to the world.

NEO

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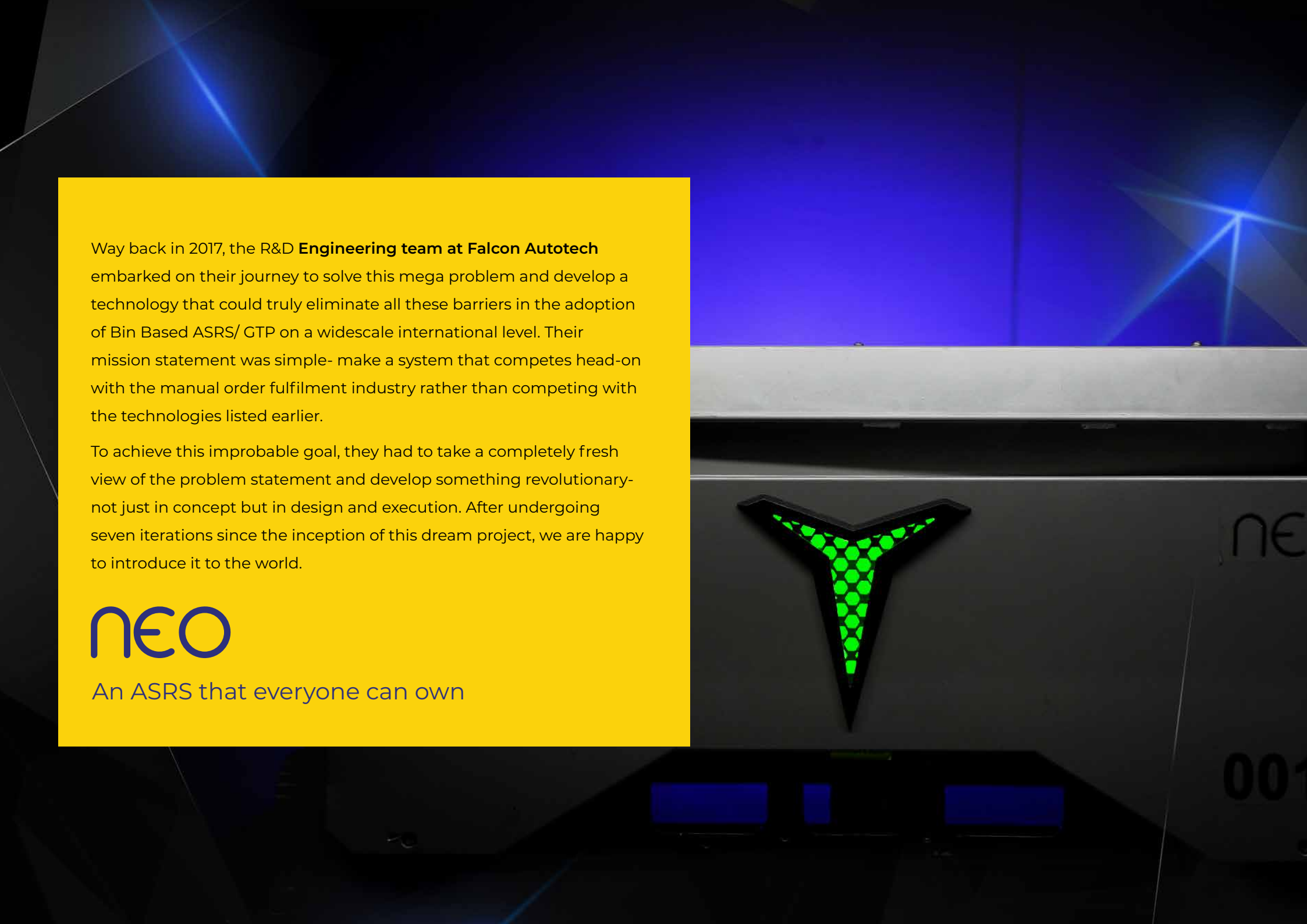


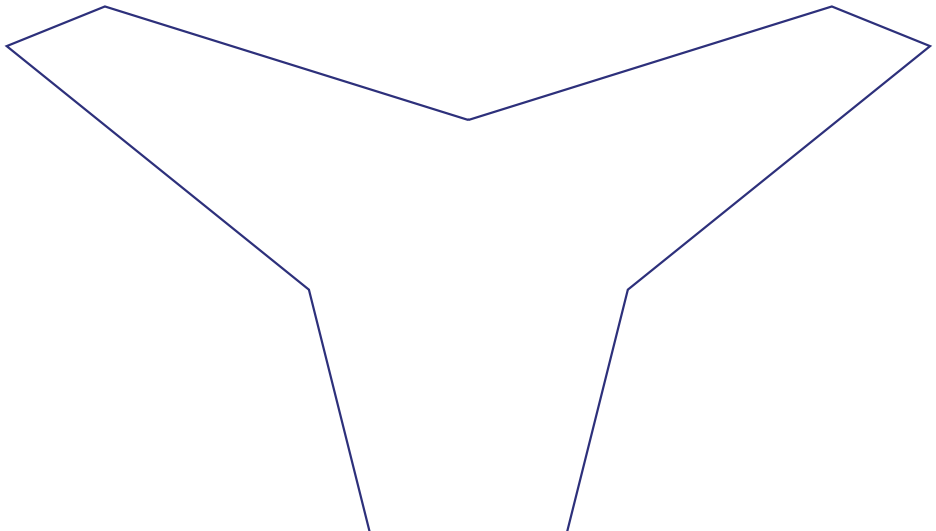
What makes **NEO** so revolutionary?

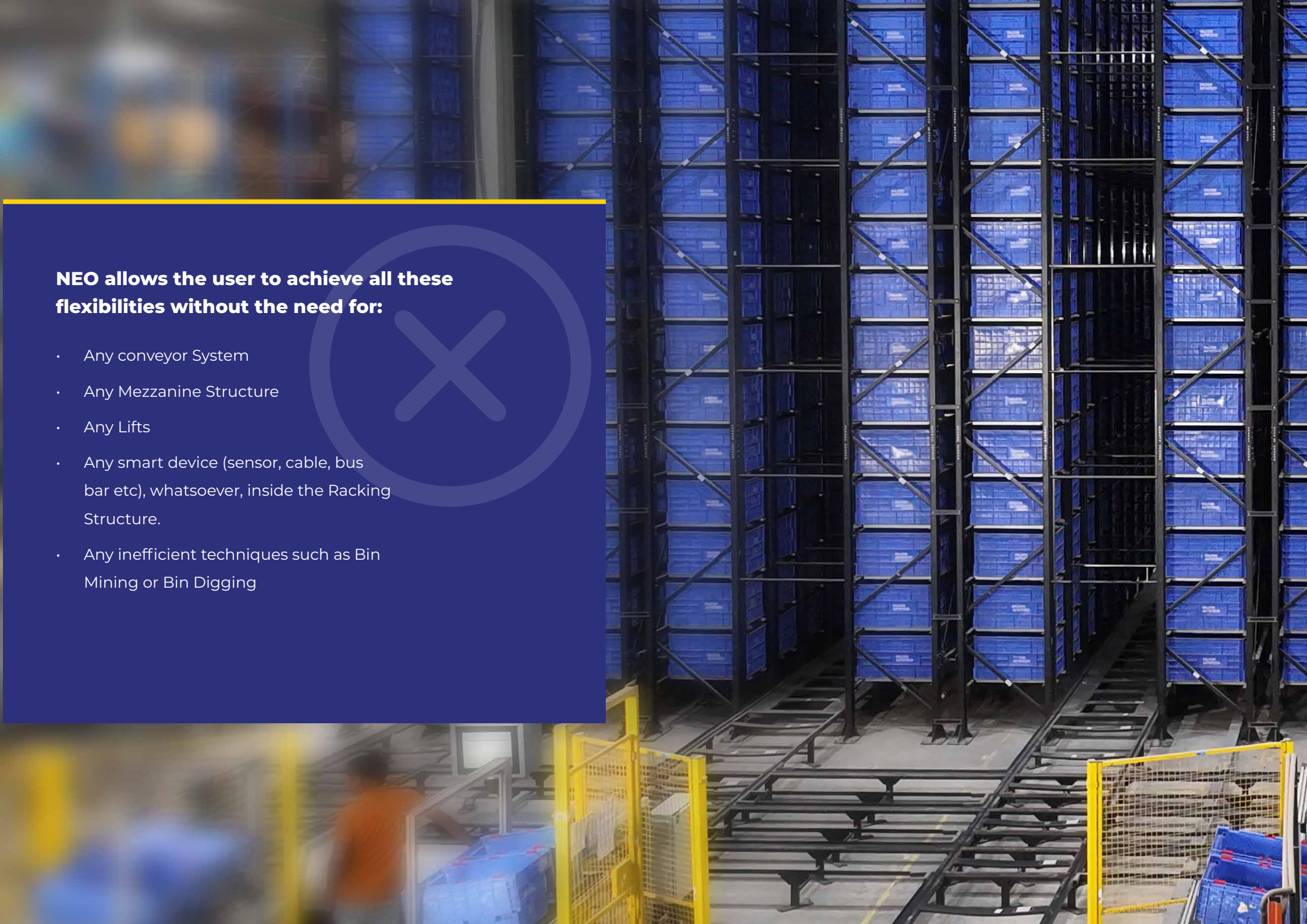
NEO is based on a redefined design philosophy that looks at the problem of Bin based ASRS/GTP from a completely fresh lens. What we wanted to develop required us to leapfrog everything available in the market and design an entirely new technology stack from scratch.

The journey took our engineers six painstaking years, and in the process, they ended up cracking some of the most challenging engineering problems, eventually giving birth to **NEO**.

NEO is an ASRS/GTP System that allows for:

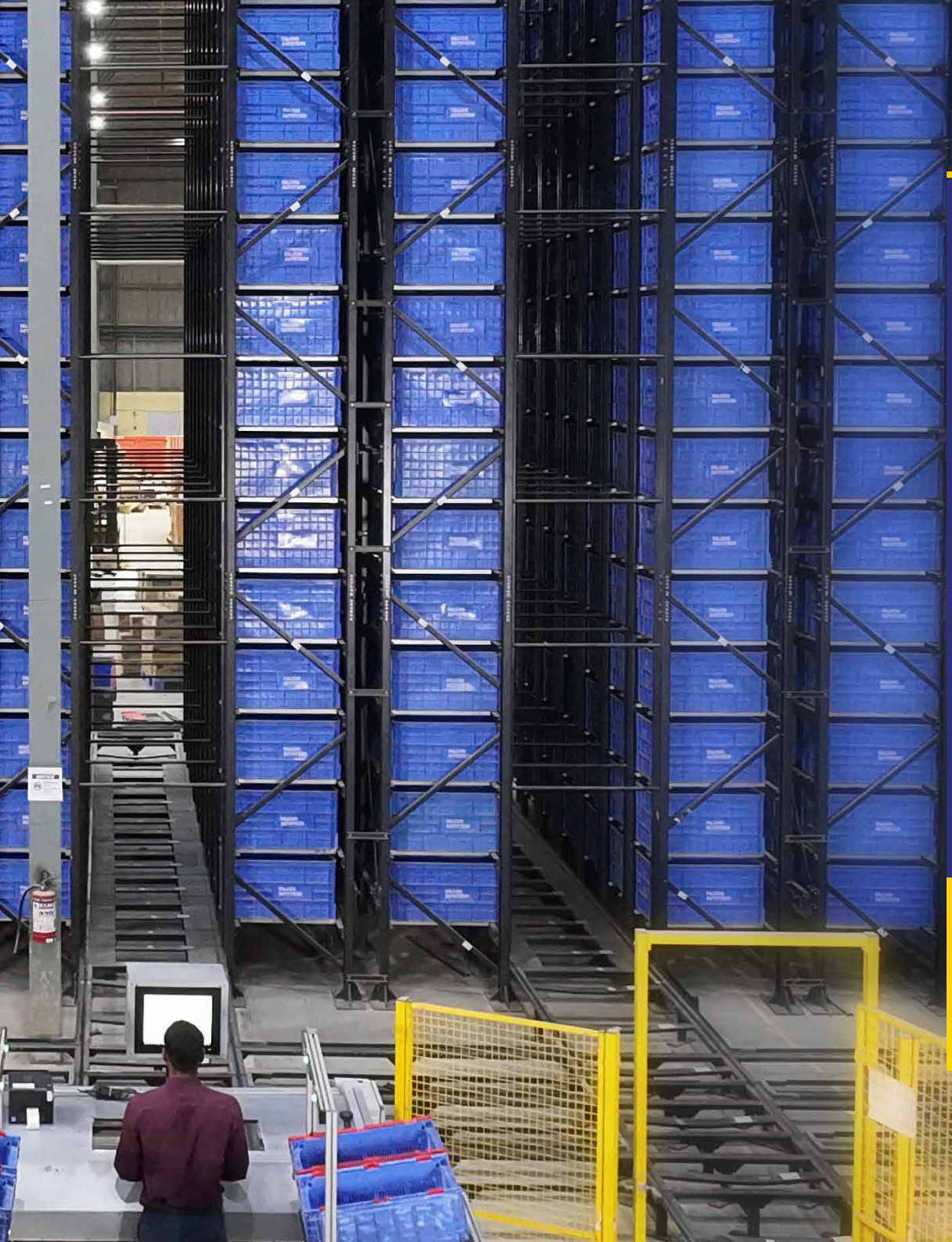
- Any Robot to access any Bin in the system
- Any Bin to be placed at any Rack location in the system
- Any Robot to be able to access any Pick/Put Station in the System





NEO allows the user to achieve all these flexibilities without the need for:

- Any conveyor System
- Any Mezzanine Structure
- Any Lifts
- Any smart device (sensor, cable, bus bar etc), whatsoever, inside the Racking Structure.
- Any inefficient techniques such as Bin Mining or Bin Digging



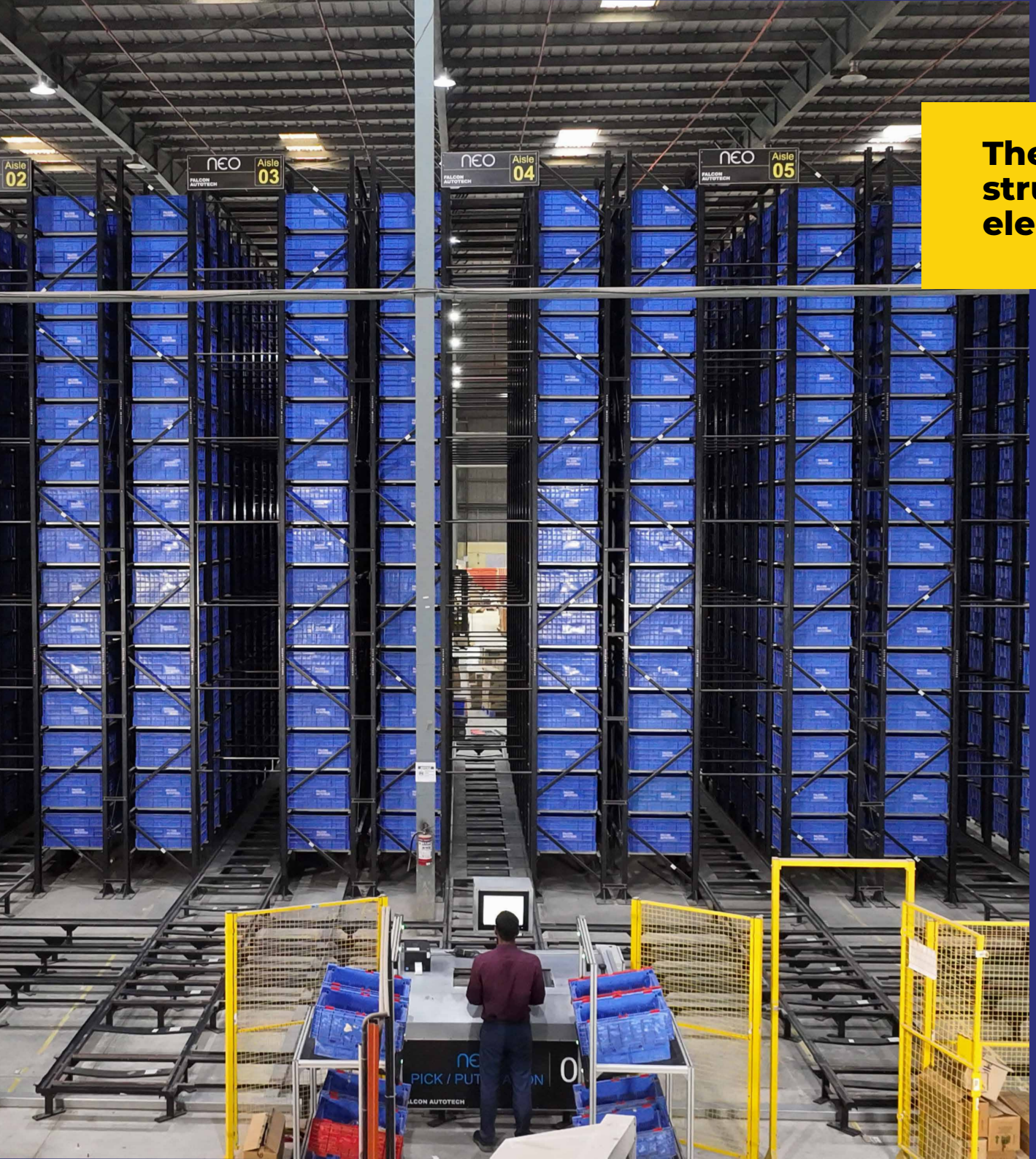
Additionally, the system is equipped with capabilities like:

- Ability to maximize the use of vertical height of the building
- Ability to scale up Storage capacity without any operational impact
- Ability to scale up throughput without any operational impact
- Ability to be installed in any existing building without the need for any special flooring
- Ability to accommodate the layout according to the building shape and size

Despite all these revolutionary features, NEO has been designed to keep affordability at the centre and offers unmatched Returns on Investment with payback periods unheard of in the industry.

NEO is inspired by modern urban city architecture, where high-rise buildings, a network of roads and highways, and self-driven autonomous vehicles create a perfect ecosystem for the future of living.

In the NEO system, high-rise buildings are represented by storage towers for Bins, Roads/Highways are represented by a network of robot movement aisles, and self-driving vehicles represent the NEO Robots with the exception that NEO Bots can not only navigate freely on the ground but also climb the racks to access the vertical heights of the storage towers.



The entire storage/racking structure is an example of elegant simplicity.

The racking is only built out of steel and has no sensors, cables, bus bars, or moving parts, making it a robust, maintenance free and always available structure.

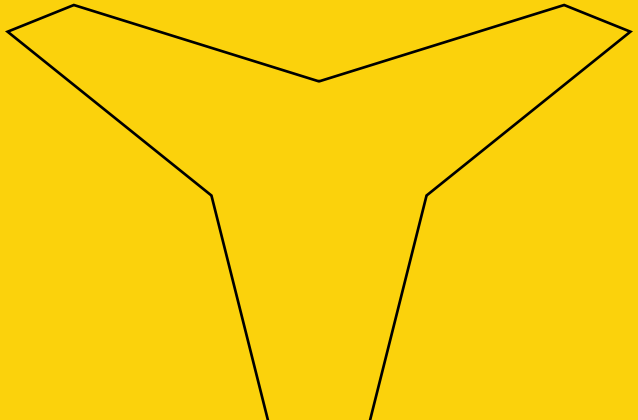
The Robots are equipped with 360 Degree Lidars and can navigate the entire grid fully autonomously and complete Pick and Put tasks at high speeds.

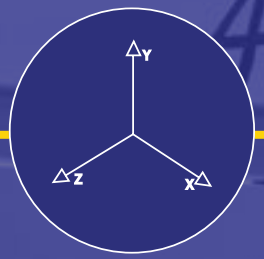
All of this is orchestrated by our state-of-the-art software, which directs the robots, provides them with the optimum routes and smartly optimizes the Order waves and Strategic Inventory Placement.

NEO is adaptive and can be deployed quickly and cost-effectively compared to traditional material handling systems. In the NEO system, users can add more robots, storage locations and Pick Put Stations on the fly with Zero impact on the existing operations, thereby making it truly scalable and flexible ASRS.

The three degrees of Freedom

NEO is an ASRS system that stores and retrieves goods in an overlaid grid within the four walls of the warehouse, without complex engineering. NEO is adaptive and can be deployed quickly and cost-effectively compared to traditional material handling systems. NEO bot moves within the flexibly constructed 3D storage grids using lidar and AI software capabilities to store and retrieve bins from the grid.





3D Movement:

In the NEO system, the bots can move freely in all three X, Y, and Z dimensions to get to their targeted bins eliminating the need for any lifts or conveyor system.

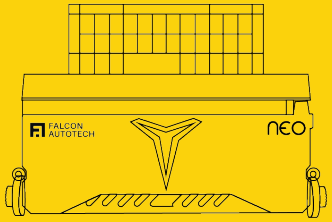
Grow as you Grow:

NEOs modular structure provides Freedom to grow as you grow. Based on your requirements, you can add more robots or more bins to cater to your growing demands.

Decoupled system:

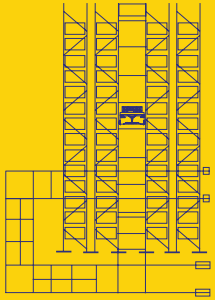
In NEO, any bot can enter any aisle, access any bin, and reach any workstation, making NEO the most flexible goods-to-person system on this planet.

NEO System Components



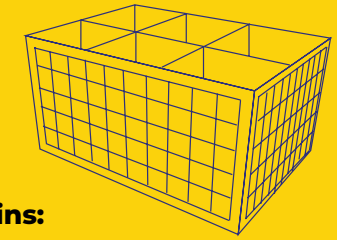
NEObots:

The NEOBots autonomously and independently move in all three dimensions under the structure and bring goods to and from picking operators. Built to operate 24 hrs, the NEOBot is powered by a swappable lithium battery, providing maximum uptime.



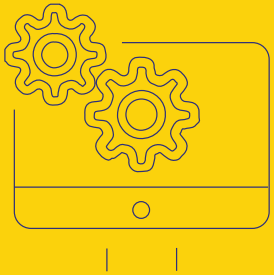
NEOgrid:

The NEO system is built around a storage grid made up of a simple racking structure that can reach a height of 60 feet to enable vertical space utilisation in the warehouse.



NEObins:

Products are stored and moved in specialised bins or totes designed to be handled by the NEO system. Each bin can be partitioned into 2/3/4/6 sub-sections for for multi SKU storage.

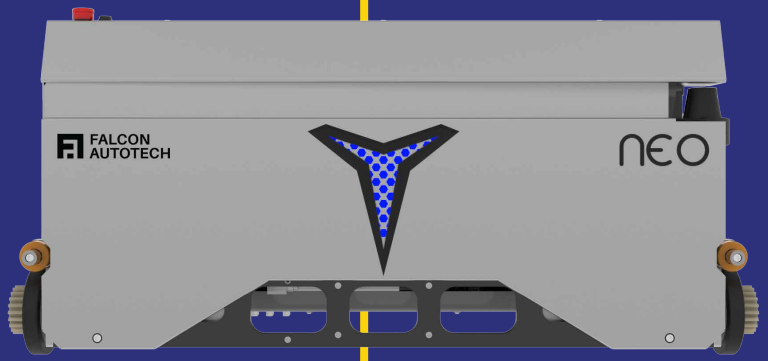


NEOiT:

NEOiT is Falcon's in-house developed warehouse control software (WCS) that controls the NEO System. NEOiT acts as a virtual WMS for the NEO system, ensuring that inventory management, order planning and route planning are done to achieve maximum throughput.

NEOstations:

NEO system comes with workstations for order picking and storage. The NEOstations enable extermely high pick and put rate via a user friendly touch screen.



NEO's Technical Features

NEObot

Your warehouse companion

NEObot is your ultimate warehouse companion that never sleeps or is on leave. A powerful machine with minimum moving parts, NEObot is always ready to deliver at its best. Exquisitely designed and engineered, the bot requires no monitoring while at work. Using advanced Lidars and AI algorithms, it moves independently in the storage grid without continuous control from the software.

Technical Specification

Weight: 185Kgs

Payload Capacity: 40Kgs

Speed: 2m/s

Size: 1016 x 908 x 526 mm

Juice: Swappable LiFepo4 battery and auto charging

NEObins

Bins that are made to last

The goods are stored safely in variable-sized bins/totes or trays that can be standard or specially designed, having several partitions for multiple product categories. These bins are highly durable and are made to last.

Technical Specification

Partitions: 8 sub-sections

Bin volume: 5.45 cubic feet

External Dimension: 780*552*425 mm

NEOgrid

The real steel

NEOgrid is the steel structure which stores all your goods. With carefully crafted racks and tracks, the grid provides easy access to bots for storing and retrieving bins, cartons or trays. Based on the urban city layouts, NEOgrid combines interior tracks, highway tracks and super highway tracks inside aisles for bots' movement between blocks to the grid and workstations.

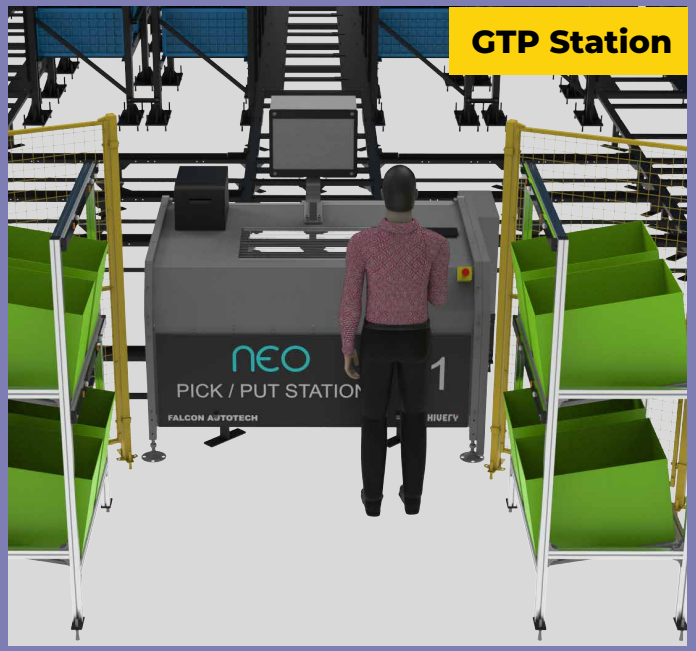
With its modular and flexible building blocks, the NEOgrid is easy to expand and can grow just in a matter of days; with no moving parts or electrical components, it provides Freedom from high-cost maintenance and replacements. NEOgrid can fit into any shape or size of the warehouse. All it needs is a flat floor.

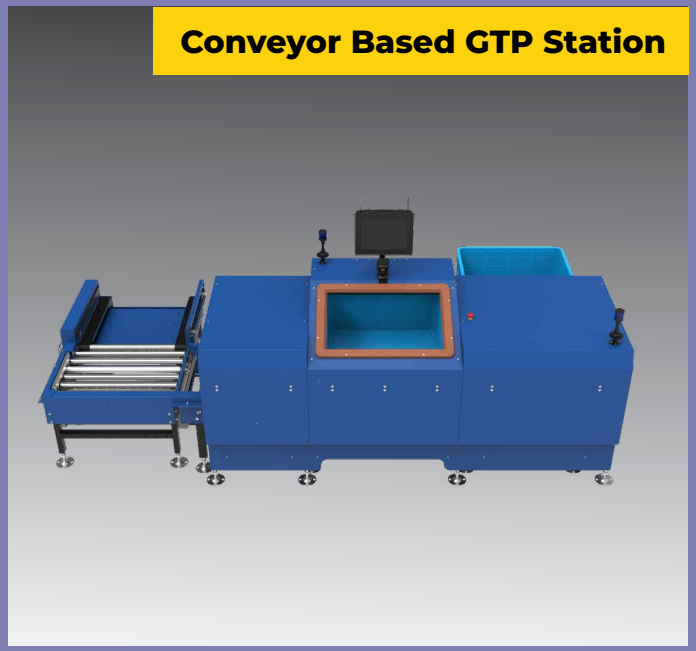
NEOstation

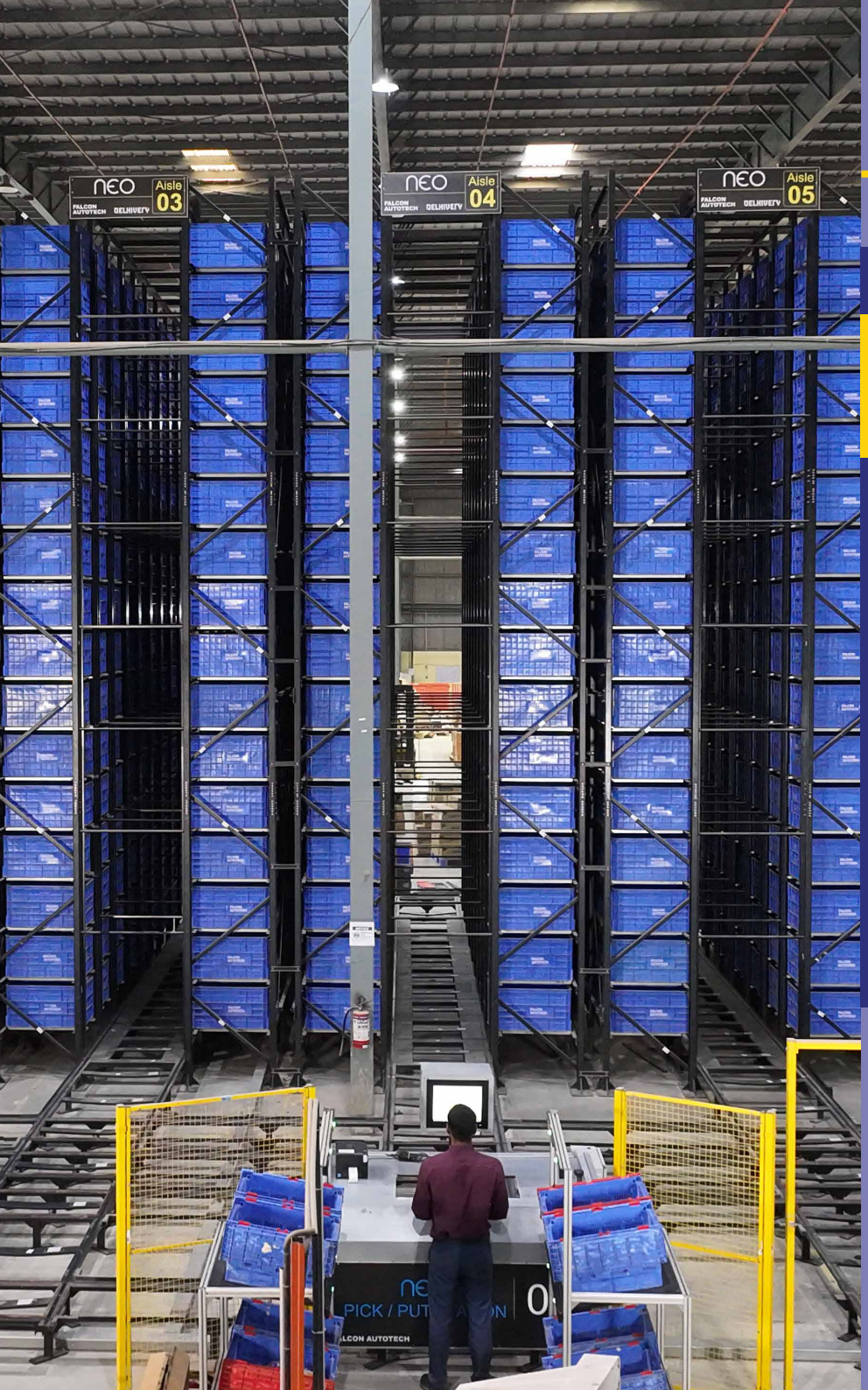
Ergonomically designed workstations

NEO system comes with operator workstations designed for picking and putting away operations. The ergonomically designed workstations provide the operators with a safe and comfortable work environment.

The workstations can accommodate any bin from the grid, and based on the use case, throughput requirements, and costs, the right design of the workstation can be implemented.







Conveyor Based GTP-station

Freedom to take bin wherever you like

NEO Conveyor stations are designed to keep the process simple. The NEObot drops the bins on the conveyor, which takes the bins to the operator working outside the grid. The bins are buffered on the conveyor to ensure wait-free picking operations, opening the horizon for multiple use cases. Combined with the PTL stations, the operator can simultaneously fulfil multiple orders.

NEOiT

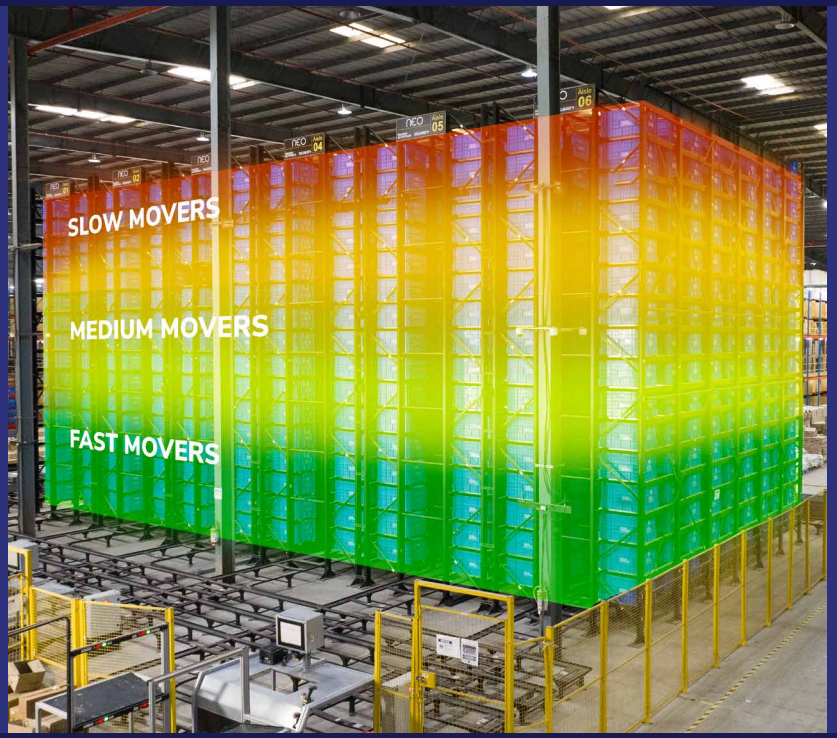
Freedom from Complexity

NEOiT is the brain of the NEO system. It is an in-house software stack to support all NEO operations, from order management to bot's route planning to bin allocations. Using robust AI algorithms and complex programming rules, NEOiT does all these operations like a breeze. Using API web services, it can quickly integrate with your WMSs, and with an intuitive user interface, it ensures faster and more efficient order preparations.

SMARTr

Storage of goods

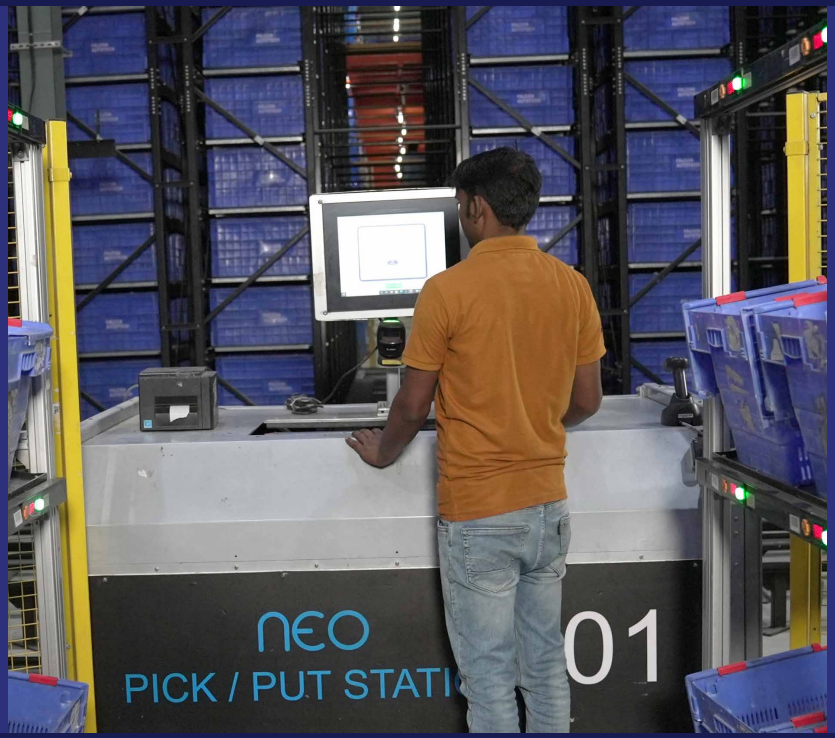
NEOiT analyses the order patterns and historical data to conduct ABC analysis before deciding on the storage location of the goods. Based on the analysis, the high-mover category 'A' products are stored nearest the workstations, followed by medium and slow movers.



SMARTr

Order Mapping based on similar SKUs

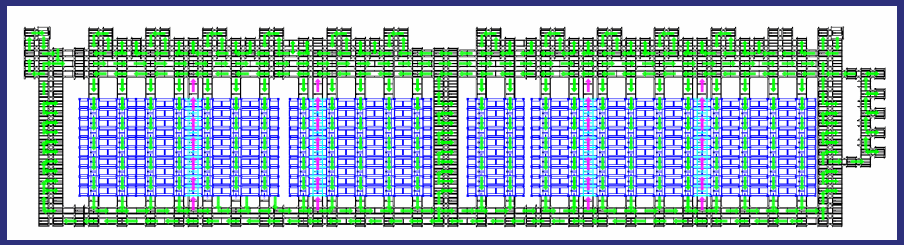
NEOiT ensures orders with similar affinity SKUs are grouped and mapped to a workstation. This maximises order fulfilment and picks productivity rate within a single bot cycle.

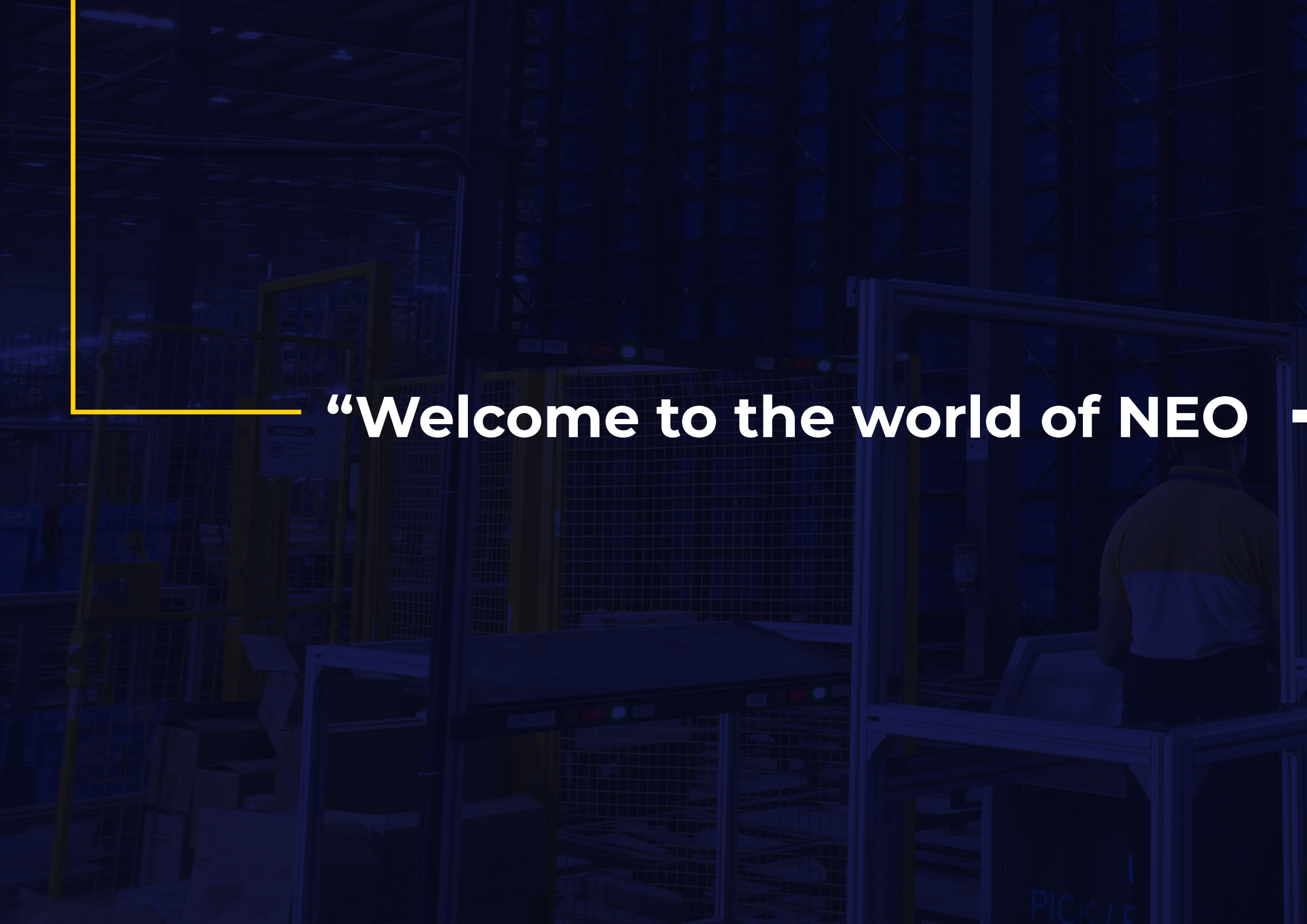


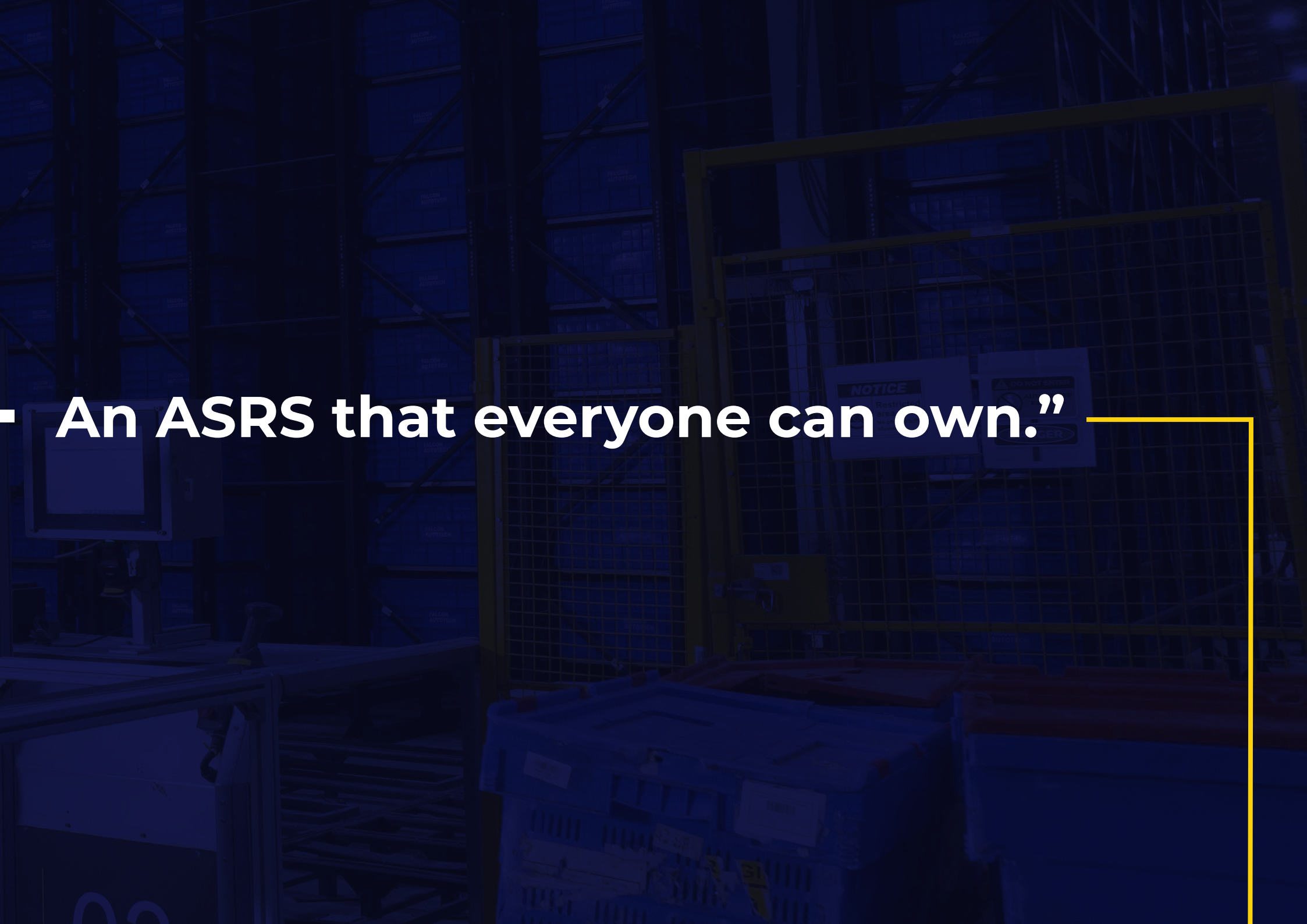
SMARTr

Route Planning

NEOiT uniquely utilises the traffic flow data, bin positions, workstation queue and multiple other parameters to calculate the best optimum route and provide the same to the bot for maximum throughput. Once the bot receives the task and the optimum route, it uses its inbuilt traffic management capability to drive through the network of aisles and completes its task.




“Welcome to the world of NEO



An ASRS that everyone can own.”

FALCON AUTOTECH

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Conveyall Natal cc

Falcon Autotech is a global intralogistics automation solutions company. With over 10 years of experience, Falcon has worked with some of the most innovative brands in E-Commerce, CEP, Fashion, Food/FMCG, Auto, and Pharmaceutical Industries. With our proprietary software and robust hardware integration capabilities, Falcon designs, manufactures, supplies, implements, and maintains world-class warehouse automation systems globally. Falcon's strong research and development team and the continuous focus on innovation reflect our strong solution line around Sortation, Robotics, Conveying, Vision Systems, and IoT. Falcon has done over 1,800 installations across 15 countries on 4 continents.

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