

## **Disruptive technology and Warehousing operations**

The main aim of any warehousing enterprise is to enhance accuracy of order fulfilment, optimise resource allocation and minimise operational costs. Precisely, warehouse enterprises are seeking to smoothen their operations and make them as cost and resource effective as possible. With the advent of digitization and the revolution it has caused in the Logistics and Supply Chain sector, seeking traditional business goals has become an easier proposition for the warehousing domain. Powerful technological solutions that promise a gamut of operations at a click of a button, have provided ease of business. However, the application of technology has gone much beyond merely providing 'ease of business'. Logistics and supply chain domain have considered several disruptive technologies to revolutionise the way traditional warehouses function. Digital disruption is often confused with disruptive technology. While digital disruption refers to a disruption caused by technological evolution affecting certain business types, disruptive technology connotes a revolutionary technology that changes the way people perform tasks. Industry players are looking for numerous disruptive technologies to enable automation, growth, profitability and cost reduction. Some of the key trends in the disruptive technology observed in the warehousing sector are:

### **Robotics in Warehouses**

Warehouses can be a harbinger for implementing automation. Using robotic equipment, not necessarily in a humanoid form, but for example in the form of automated intelligent machines that are capable of segregation, coalition and movement of cargo within or among warehouses, are a coveted form of automation. These robotic devices could be in the form of pallet shuttles, automated storage retrieval systems, automatic guided vehicles or autonomous indoor vehicles too. The idea is to place a robotic device that can accept command, is capable of comprehending it and carrying out the necessary warehousing functions. Robots in a warehousing can be utilized to carry out operational tasks for warehouse, such as bin picking, case and pallet transportation, robotic pick-and-place solutions, conveyor design, lift-assist systems or integrated sorting systems, among other functions. There is an enormous potential to the kind of functions an automated, well designed robot can execute for warehouses. For example, warehouses are automated with mobile robots and control software. These robots are sent on missions by a central computer system to retrieve inventory pods that are brought back to pick and packing stations. These robots are capacitated to handle about 1,000 pounds of weight and are equipped with a rechargeable battery system and internal sensors which enable their free movement within a warehouse without crashing into other robots or things. The shift towards robotics and automation is likely to transform warehousing, from a person-to-goods process to a goods-to-person process.

### **Augmented reality**

Analysts are affirmative about exploring application of augmented reality in warehousing operations. They are looking at augmented reality applications in the form of headsets with interactive screens that display digital information pertaining to the cargo in front of them. Warehouse workers can then tap directly into the order system and create records and streamline or schedule cargo movements at a click. Hands-free solutions enable pickers to navigate in the warehouse, make decisions on how many of which box need to be moved (the screen highlights the box in front of the picker to ensure they are getting the correct box) and even which warehouse loading dock these boxes need to be taken to. Traditional barcode scanning validation can be replaced by the augmented reality-driven smart glasses that can enable auto-driven scan and validation of a cargo as soon as it appears in the field of vision. Though many warehousing and distribution centers are already using similar technology through devices such as barcode scanners, augmented reality is a step ahead as it drives, more than just picking and scanning, including for example, warehouse navigation.

### **3D printing**

Adoption of 3D printing will enable faster roll out of new products, shorter lead times and better customisation. However, from a warehousing perspective since local/regional supply base will have more capabilities to be more responsive to local and regional needs, reliance on large facilities that can produce high volumes at low

cost could lessen. This will result in diminishing demand for bigger storage warehouses. Warehousing solutions may need to alter or rethink their offerings.

#### **Driverless carts**

Warehouses have implemented driverless carts that are directed through the warehouse via sensors in the floor. This has created disruption as traditional human driven forklifts will become obsolete.

#### **Cloud-based technology**

Cloud based services can deliver better speed and savings compared to traditional systems. Warehouses can share cloud-based services and avail them at lower prices as compared to traditional software. The community nature of cloud drives alliance from fellow warehousing companies to tackle joint challenges such as facilitating a fully electronic supply chain, meeting new regulations and changing established ways of working across the industry.

#### **Extension and Expansion**

Another digital disruption that has already affected the warehouse domain is the entry of allied businesses. With e-Commerce capturing global market, companies like Amazon, Alibaba etc., have extended their business and are establishing in-house warehousing solutions to cater to their growing business. Fully equipped warehousing solutions are helping the new entrants to lower their costs and manage in-house operations effectively. This move has already challenged many exclusive warehouses, who view it as a potential threat to their sustainability.