



Leverage technology to  
**SOLVE**  
business problems

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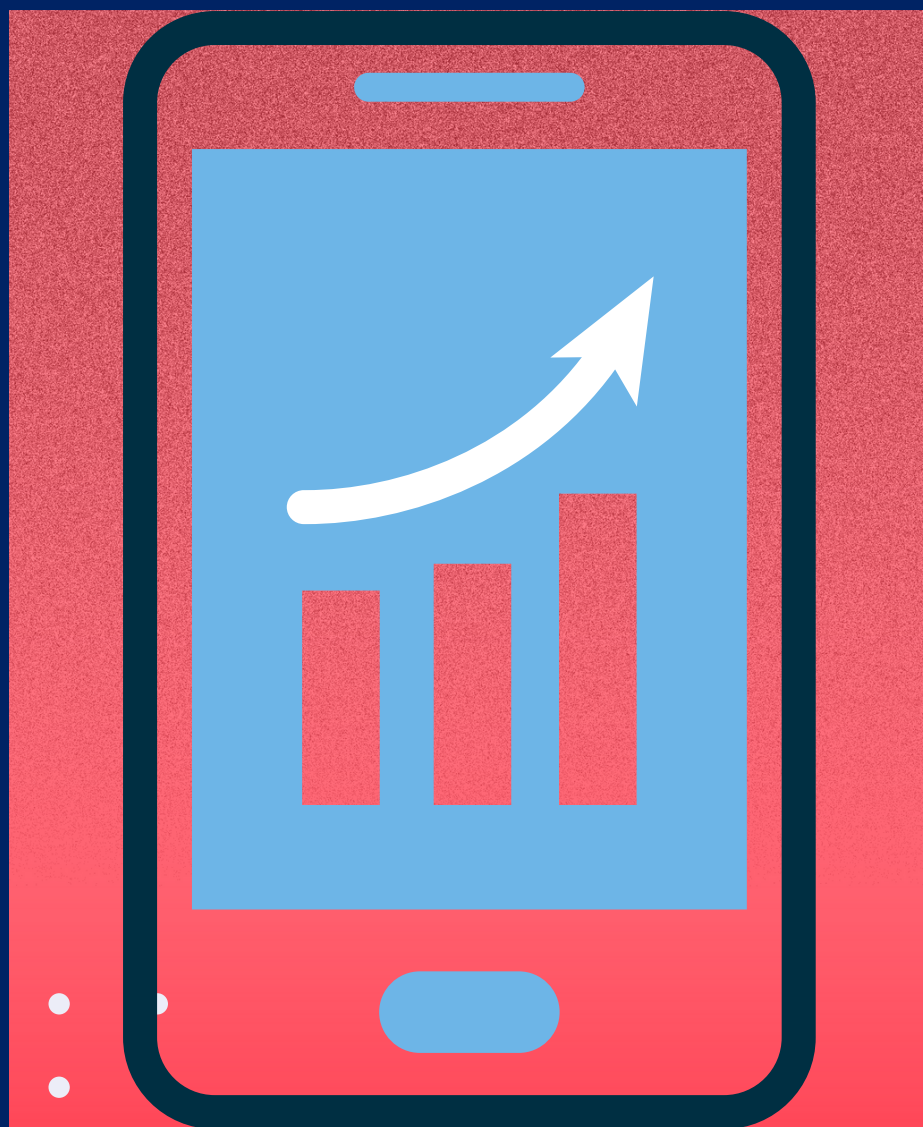
# Internet of Things & Supply Chain

A PRIMARY STUDY AND OVERVIEW



Pratik Agarwal, Analytics  
Quad4 Intern

# TECHNOLOGY IN SUPPLY CHAIN



- Rapid Technological Innovation Driving Business of the World
  - Increased Computing power – Cloud storage: SaaS, PaaS, IaaS
  - Internet and global connectivity – 3.6 Networked Devices per capita by 2023 (Cisco Report)
- Automation in Warehousing, IoT and AI/ML in Inventory management, Analytics and Cloud in Logistics, Data management and so much more
- Strategic and Competitive Advantage
- Exchange of Information, Monitoring of physical goods along the supply chain



# INTERNET OF THINGS



- Multiple connected devices switching on and off the web in order to use software and automation processes for smart applications.
- 14.7 Billion M2M connections, nearly half of global connected devices by 2023
- Two Classification views possible: Component View or Layers View



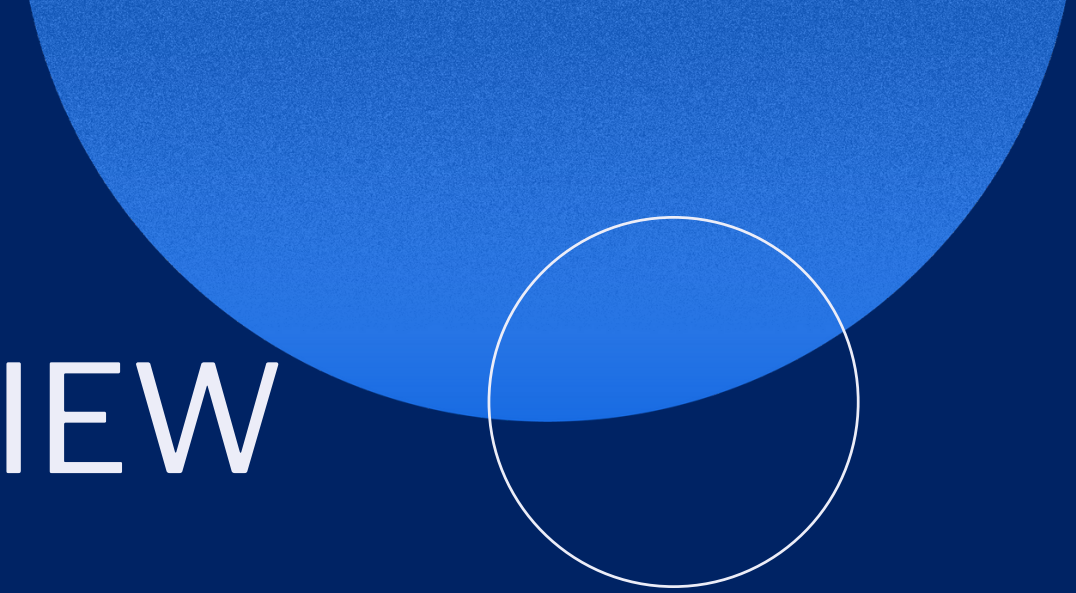


# ESSENTIAL COMPONENT CLASSIFICATION

Internet-oriented  
(middleware) - protocols to  
ensure physical objects  
networking and internet  
reachability

Things-oriented  
(devices, sensors) –  
Smart objects like  
sensors, actuators,  
RFID

Semantic-oriented  
(knowledge) – Information  
sharing and resource  
accessibility through Web-  
Interfaces



# ESSENTIAL LAYERS VIEW

The sensing layer - integrates existing hardware to sense the physical world and acquires data

The networking layer - connects and transfers data over wireless or wired networks

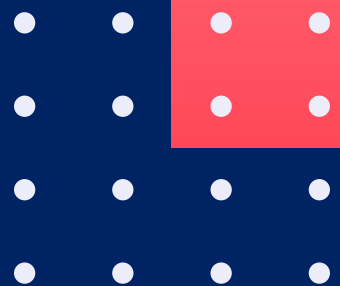
The service layer - integrates and manages services and applications through middleware

The interface layer - displays information and allows the user to interact with the system.

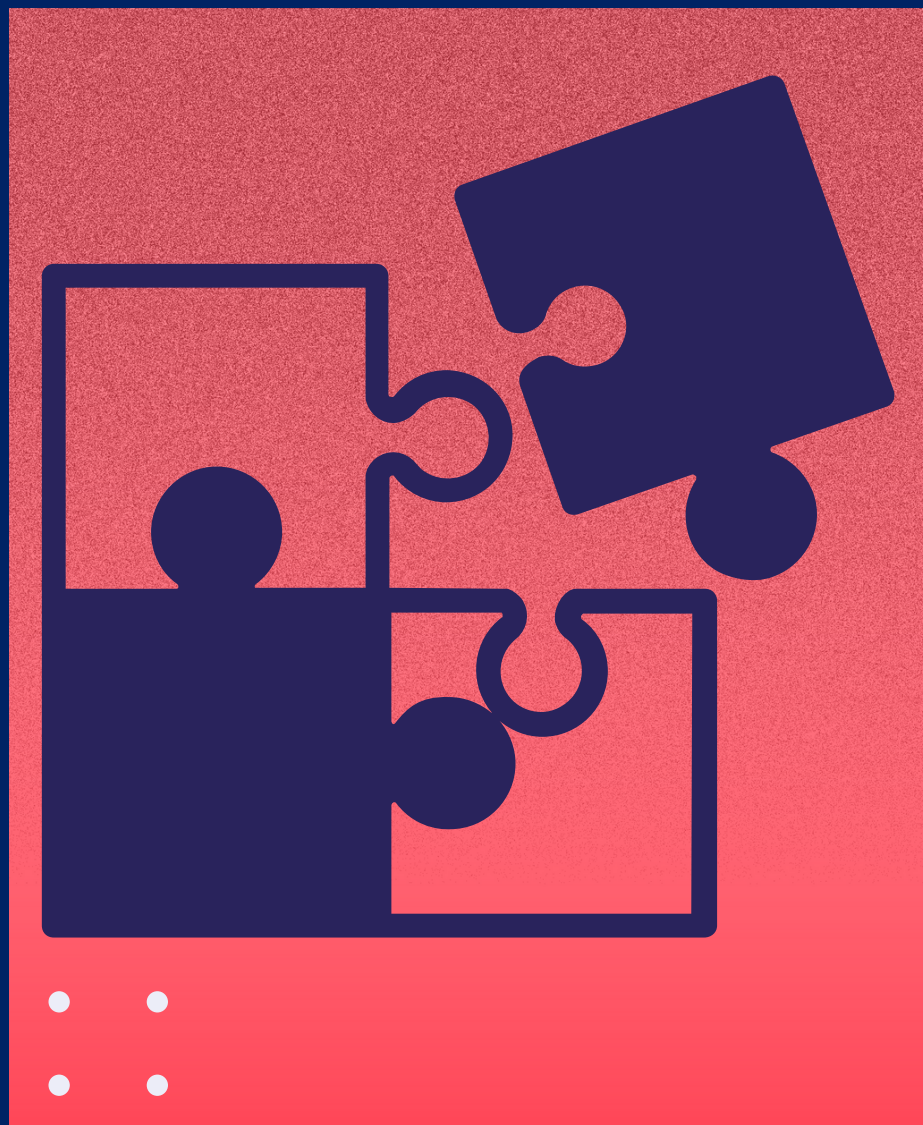
# IoT IN SUPPLY CHAIN



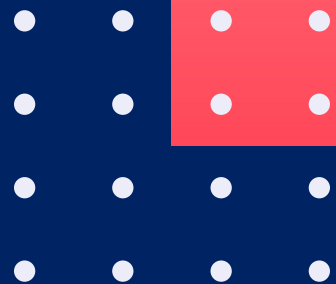
- A network of physical objects digitally connected to sense, monitor and interact between a company and its supply chain
- Enables agility, visibility, tracking and information sharing
- Facilitates timely planning, control and coordination of supply chain processes
- The industrial IoT market will increase from USD 77.3 billion (2020) to USD 110.6 billion (2025) - CAGR of 7.4%



# SOME USE CASES



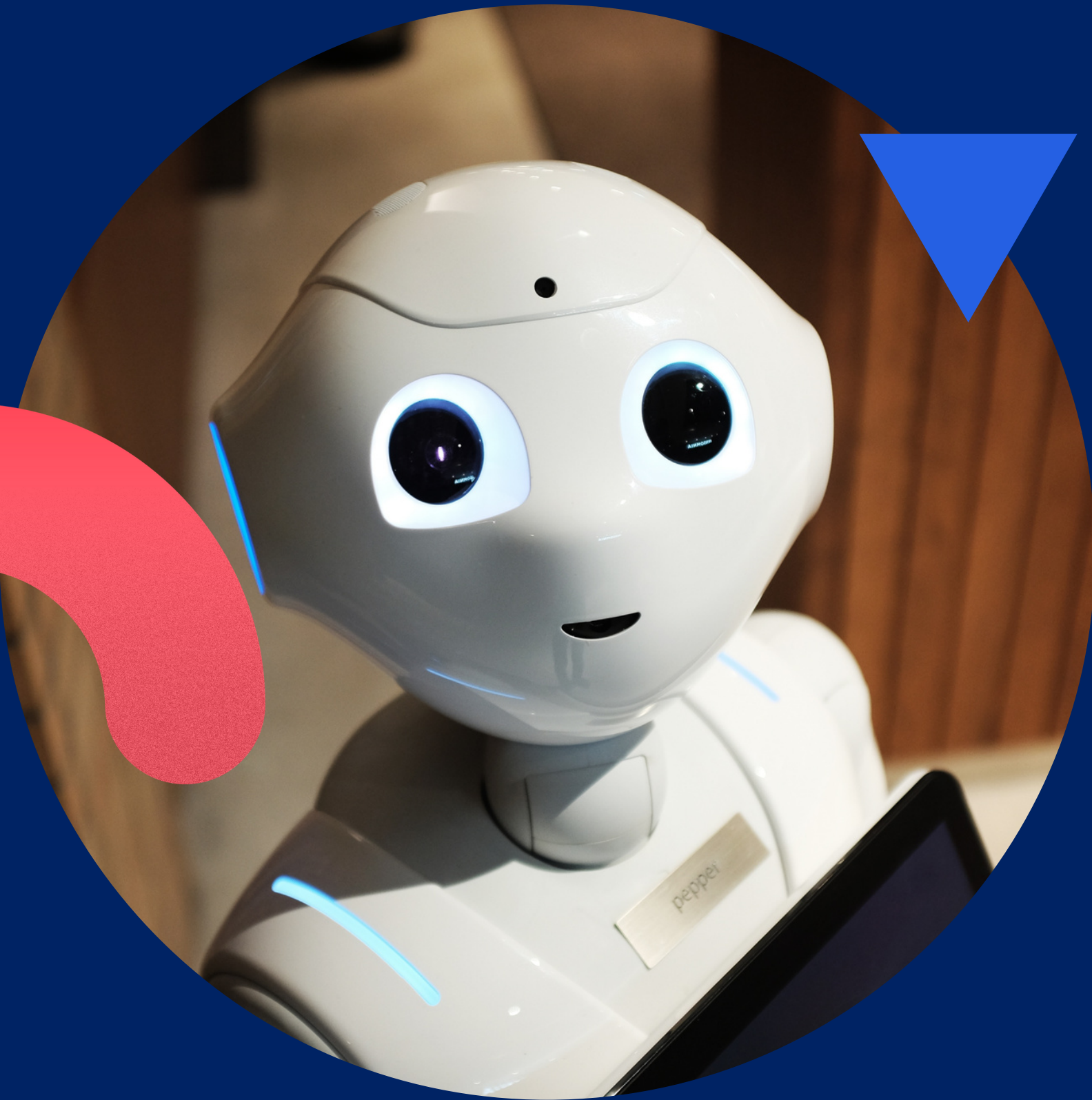
- Networks for plant & Warehouse control and enterprise information management using RFID network for logistics management
- Storage and Transportation Monitoring –Monitor conditions as temperature, humidity, light, shaking and other external environmental factors
- Real-Time Location Tracking of product location and transportation process to minimize risks of theft, loss and other path deviation during Transportation
- Stock and Inventory Forecast and Planning in the entire supply chain using more accurate information





The Amazon logo, featuring the word "amazon" in a bold, lowercase, sans-serif font, with a curved orange arrow underneath it that starts under the letter 'a' and ends under the letter 'z'.

Using Wi-Fi connected robots provided by Kiva Systems (acquired by Amazon itself in 2012) – to recognize products by QR codes reading through built-in cameras.





**MAERSK**

Partnered with Ericsson in 2012 to install real-time monitoring across its entire fleet of 300,000 refrigerated containers. Now transmits vital info & stats, such as temperature, location and power supply, via mobile and satellite communications technology which is sent to cloud and analyzed in a central office..

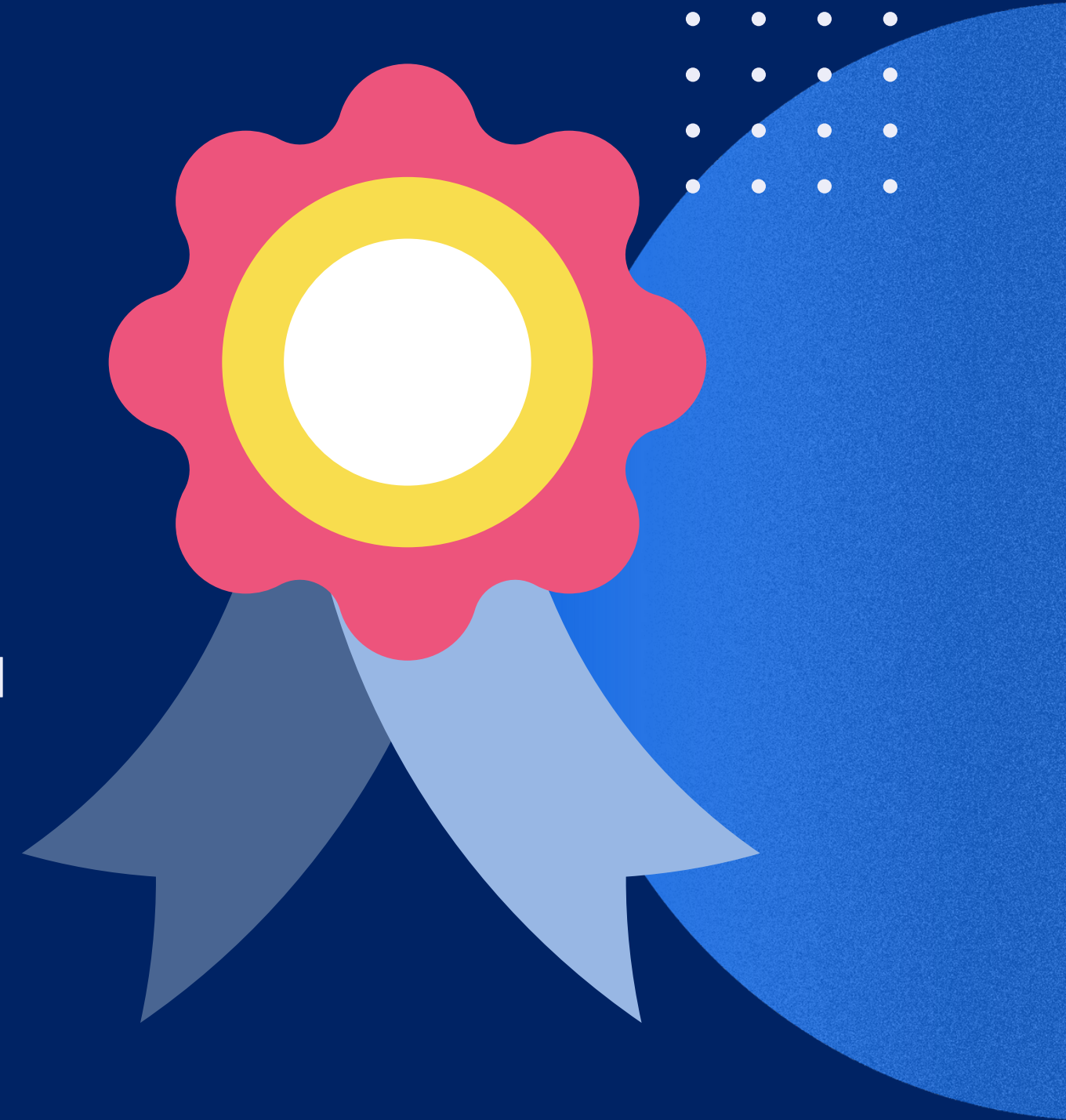
# DECATHLON

Track and Trace feature use with radio frequency identification (RFID) from Checkpoint Systems, in more than 400 of its stores. Products get delivered to vendors with better accuracy and items arrive shelf-ready, enhancing human resource time efficiency.



# BENEFITS

- Transparency and Visibility of Information Flows - accuracy and availability of operations transactions along forward and reverse movement in both services and manufacturing industry.
- Flexibility through Traceability - Real-time traceability of each stage of product/service movement enable supply chains to adapt and synchronize the same better.
- Better Control and Management over resources - enables enhanced planning, quality assessment and decoupling of information thus mitigating the need of human intervention.
- Collaboration through integration of Internal Business Processes - enables a strategic realignment of all operations business processes in integrated fashion to improve operational performance



# VULNERABILITIES

- Lack of Standardization across supply chains with heterogenous technologies and data services - With no global standards, the complexity of devices that need to connect and communicate with each other has increased exponentially. Thus integrating existent as well as upcoming IoT technologies by developing a global communication protocol remains a challenge.
- Cyber-security risks and threats - The open communications network provided by IoT also opens supply chain to serious drawback of losing or theft of confidential and commercial information. Lack of transport encryption, insecure web interfaces, inadequate software protection, and insufficient authorization make its implementation a lot vulnerable.



# GOING FORWARD

- The Gartner, Inc. 2020 Hype Cycle for Supply Chain Strategy shows that the Internet of Things (IoT) has reached the bottom of the Trough of Disillusionment.
- This new forecast categorizes IoT as transformational technology.
- Thus it needs to make the current technology processes efficient, through better tracking and measurement practices rather than only innovating or experimenting.

## Hype Cycle for Supply Chain Strategy, 2020



Plateau will be reached:

- less than 2 years
  - 2 to 5 years
  - 5 to 10 years
  - ▲ more than 10 years
  - ⊗ obsolete before plateau
- As of July 2020

[gartner.com/SmarterWithGartner](https://gartner.com/SmarterWithGartner)

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THANK  
YOU

