BREAKBULK
EDUCATION DAY

DRIVING THE BLUE ECONOMY
TEXAS A&M UNIVERSITY AT GALVESTON

HOUSTON MARITIME Center & Museum
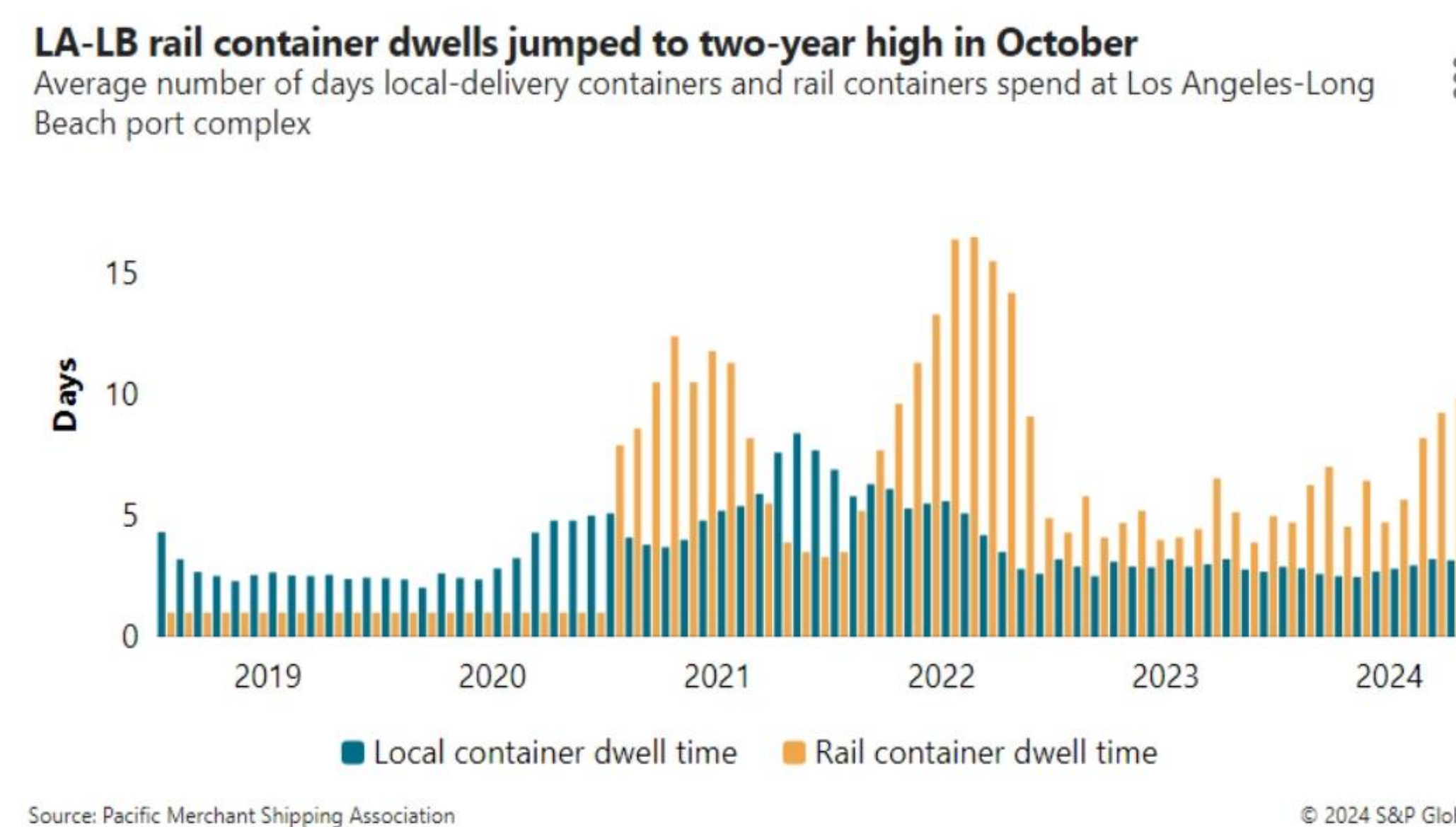
1. Introduction

Intermodal freight moves goods across ships, rail, and trucks, linking critical global trade. Yet each modal handoff introduces risks like **theft, delays, and data gaps**.

In 2024, **cargo theft cost U.S. shippers $455 million**, with billions more lost to disruptions. As e-commerce and sustainability demands grow, secure and transparent logistics are more critical than ever.

2. Key Challenges

1. **$450M in U.S. losses (2024):** Thefts often occur during modal transfers and dwell times, targeting high-value goods.
2. **Ghost Capacity:** Unused transport lanes and phantom loads lead to wasted resources, inflated costs, and poor carrier utilization.
3. **Unauthorized Rerouting:** Unplanned route changes disrupt delivery schedules, weaken chain-of-custody documentation, and trigger compliance risks.
4. **Dwell Time:** Idle containers at ports and terminals slow operations, increase costs, and heighten vulnerability to theft and tampering.
5. **Visibility & Cybersecurity Gaps:** Outdated tracking systems and disconnected data streams create blind spots.

Figure 1: *Rail Delays at LA-Long Beach Ports Amid 2-Year High Container Dwell Times*

LA-LB rail container dwells jumped to two-year high in October
Average number of days local-delivery containers and rail containers spend at Los Angeles-Long Beach port complex

Local container dwell time / Rail container dwell time
Source: Pacific Merchant Shipping Association © 2024 S&P Globe

3. Tech Spotlight: BloodHound GPS & Emerging Tools

1. **BloodHound GPS Tracking:** A multi-sensor device offering real-time location, motion, light, temperature, and human presence detection.
   ✓ Proven to <u>reduce theft by over 40%</u> in pilot programs.
2. **Blockchain** secures chain-of-custody records:
   ✓ Enables smart contracts for <u>faster, error-free handoffs</u>.
3. **Artificial Intelligence (AI)** using real-time and historical data:
   ✓ Predicts delays, optimizes routing, and identifies theft risk zones
4. **Digital Twins** simulate logistics networks to:
   ✓ Test scenarios, manage congestion, and improve planning

Figure 2: *Image of Bloodhound's GPS technology unit looks like a container vent and is always painted to match the carriers' selected colors.*
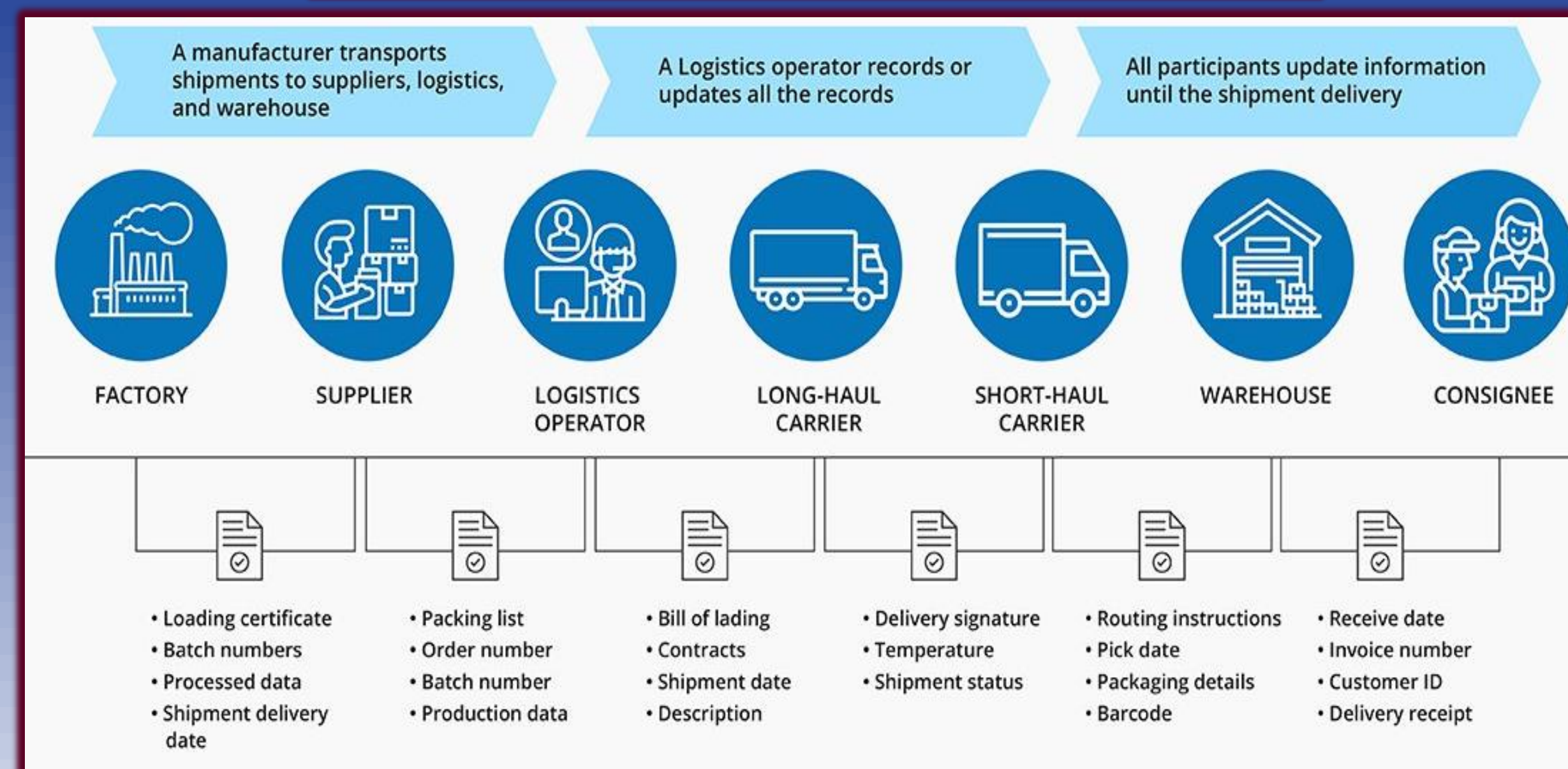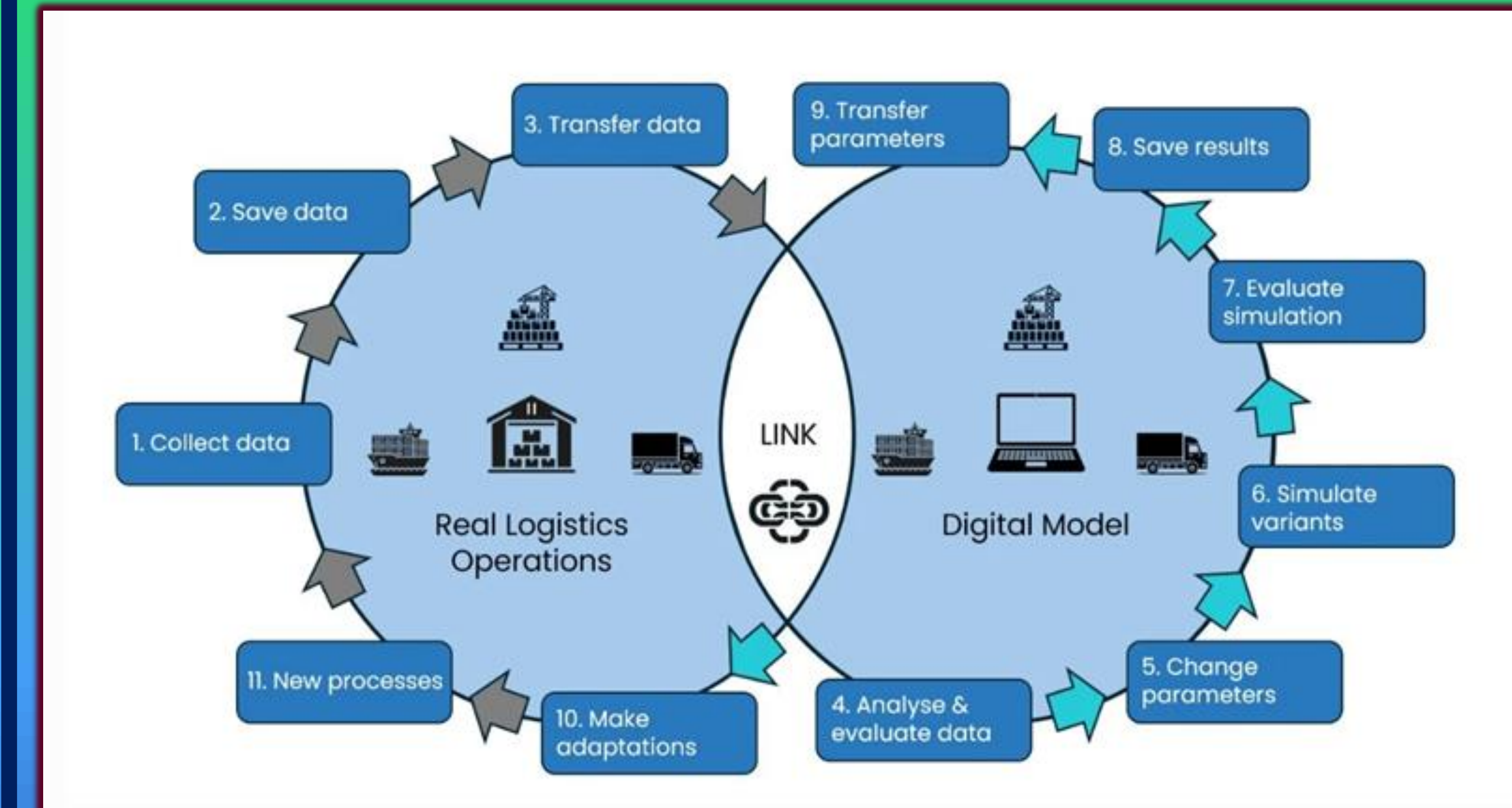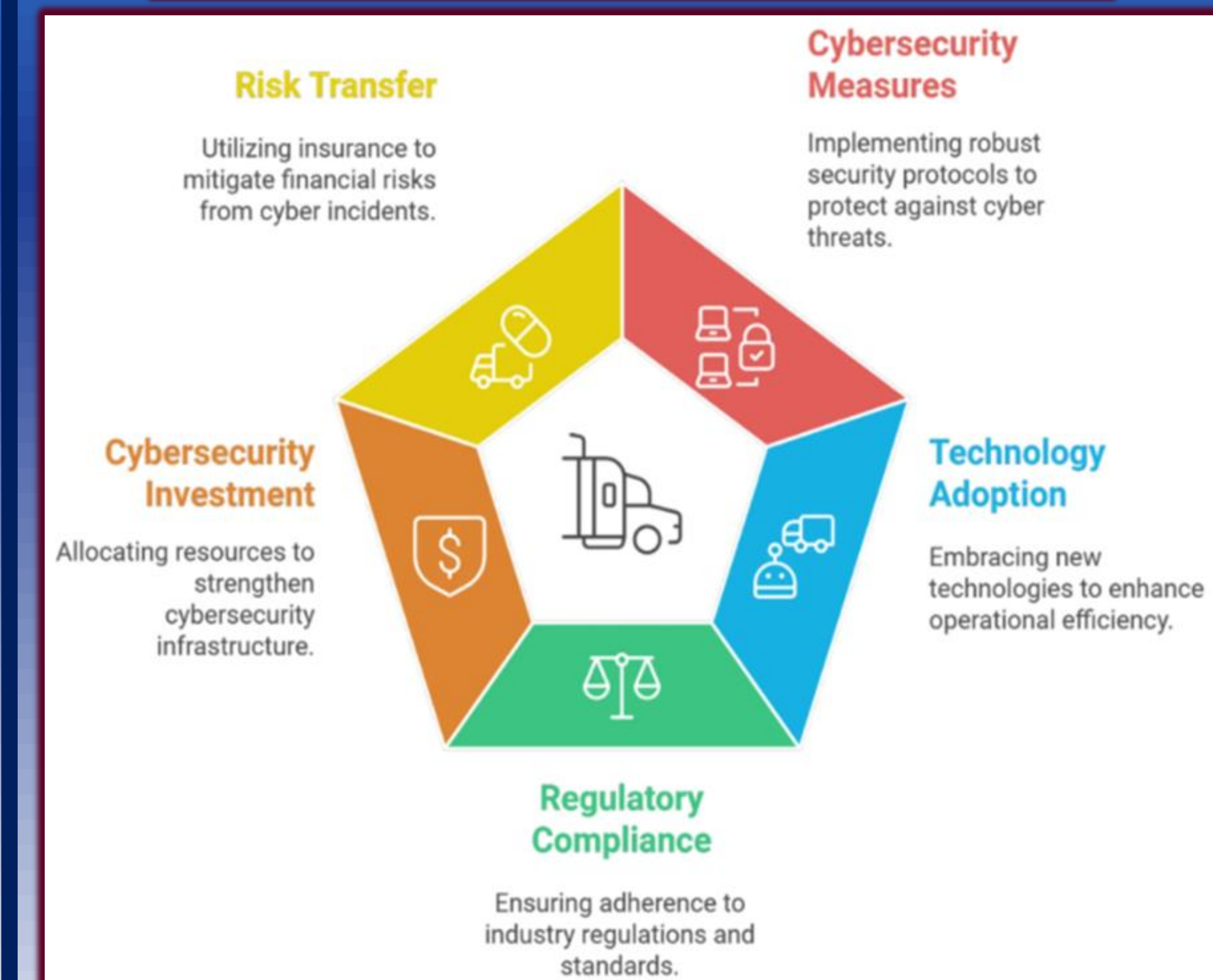

Figure 3: *Logistics Processes with Blockchain*

Figure 4: *Digital Twins in Logistics flow chart*

4. Future Benefits

Figure 5: *Logistics Companies' Strategic Focus*

References

Authors

Enhancing Intermodal Security and Visibility

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