Logistics Automation

Dr. Balakrishnan . A. S.

MP&L Plant Group, Material Flow, Packaging Engineering

International Market Group

Ford Motor Private Limited, Chennai, India.

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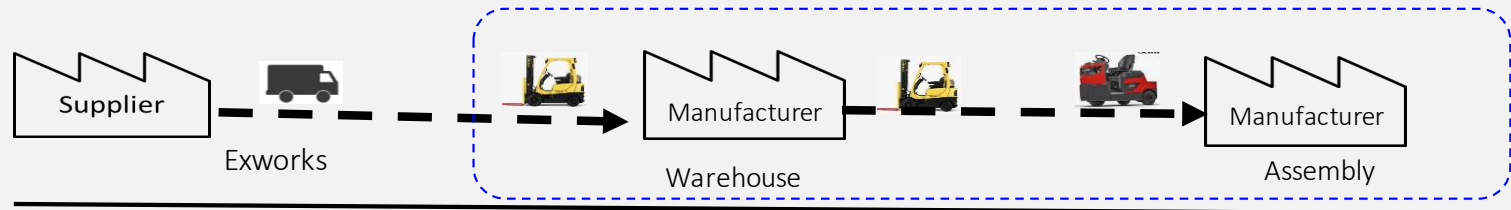# Current Trends & Future opportunities in Material -Flow Automation

Material Flow Value Chain from Supplier to OEM

Suppliers → OEM Warehouse → OEM Assembly Line

Information Flow

Supplier

Prod Schedules
Mfg Plan
Requirement
Shipping Schedules

Manufacturer

Material Flow

Supplier — Exworks → Manufacturer (Warehouse) → Manufacturer (Assembly)

Current Process Flow and Technologies

✓ Logistics from Supplier
✓ Shipment as per Customer Release (MRP)
• Window Shipment
• Milk Run / Cross Docking
• Live Shipment Tracking by (GPS/ RTLS)
• Cube Utilization (thro Logistics Systems)

✓ Dock Unloading
• Truck Calling system
• Dock Window time Management
• Safe Unloading Thro Process & Systems

✓ Storage
• Automated Storage ASRS
• Narrow Aisle Equipment / Racking
• Integrated Warehouse Management System

✓ Market Place
• Integrated Pull System
• Pick To Light Enabled Kitting
• Scan to Pick Sequencing

✓ Delivery to Lineside
• Standard Delivery using Pull Systems
• IOT Enabled Devices in MH Equipment's to support on time delivery
• Manage Complexity thro Kitting & Sequencing
• Fork Free Concept feeding to line (Improved Safety)
• Connected Flow from Warehouse to POF using Integrated WMS & replenishment Systems

Current Value Chain and Systems supporting Logistics

3

Technology Enablers / Opportunities in Material Flow

Supplier to Customer Dock → **OEM Storage & Delivery** → **OEM Mfg Line**

Supplier to Customer Dock

Transport Management & Truck Calling system

GPS Enabled Trucks / Track & Trace

Window Schedule Management

Returnable Mgt.
System guided RFIDs

Dynamic / Predictive Routing

OEM Storage & Delivery

Automated Storage – ASRS
Vertical Carousel
VNA Equipment

Safety Light Enabled
Fork Truck

Autonomous PMHV
RT/VNA/Pickers

Warehouse Management System
System guided operations

OEM Mfg Line

Pick to Light
Wireless Paperless

Scanning
Handheld
Barcodes
RFID

Vision Picking
Goggle / AI / AR

MRT/ Call button/ SMART/ Tab
System guided replenishment triggers

Autonomous Delivery
AGVs AMR
Drones
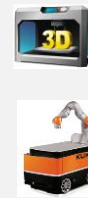Integrated Conveyors

Robotic Process Automation

Enablers & Components to support Connected Material & Information Flow

4

Enablers to Support Future Technology

Components / Enablers

Technology
- IIoT
- Cloud Computing
- Autonomous Robots
- Connected Systems

IT
- Big Data & Analytics

Manufacturing
- Simulation & Validation
- Systems Integration
- Virtual-Augmented Reality
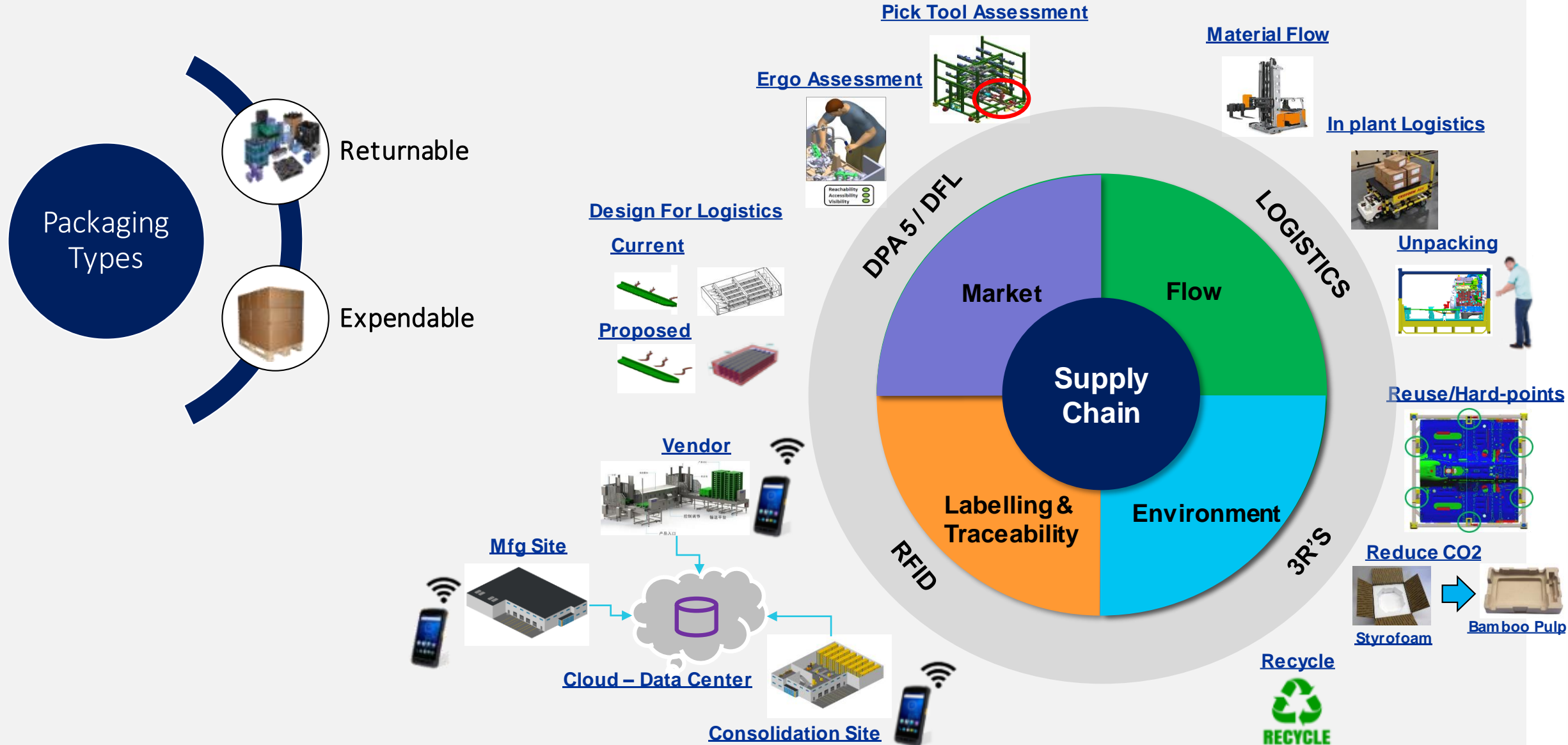- Smart Machines (RFID/ Wireless)

Packaging

- ✓ Packaging Integrated with Supply Chain
- ✓ Role of Automation in Packaging
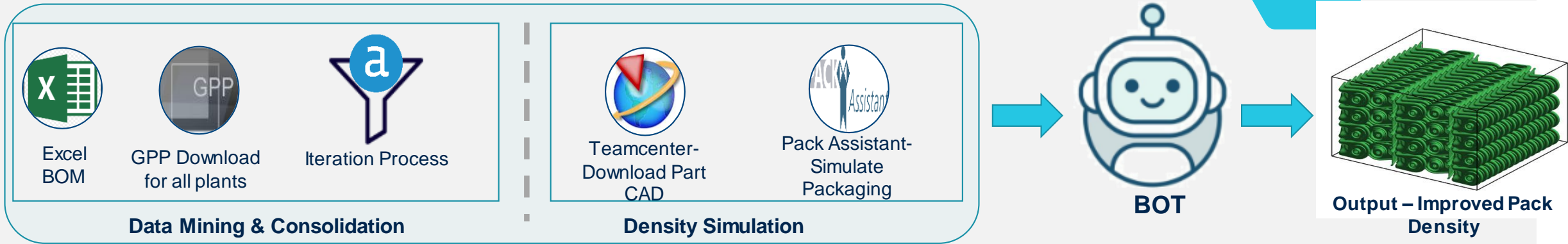
Packaging - Integration With Supply Chain

Optimized Packaging Design Increase The Cash Flow, Improves Supply Chain Efficiency & ROI

Robotic Process Automation in Packaging

Purpose of Automation to avoid the repetitive tasks, helps to Reduce the cost nearly 30% and Improve internal processes.

Pack Density Simulation

Excel BOM	GPP Download for all plants	Iteration Process

Data Mining & Consolidation

Teamcenter-Download Part CAD	Pack Assistant-Simulate Packaging

Density Simulation

BOT

Output – Improved Pack Density

Packaging Approval

Enter GPP	GPP Download 1271 form	Review the Form Content

Data Mining & Review

Packaging Guideline	Teamcenter Part CAD	Pack Assistant-Simulate Packaging

Verify the supplier input

BOT

Decision Making

Approve / Reject

Technology Enablers – Packaging

Now	Near	Far
(0 → 12 Months)	(12 → 24 Months)	(> 24 Months)

Now

Robotic Process Automation

Additive Manufacturing aka 3D Printing

3D Scanning for CAD Modelling

Big Data used for Pack Density Improvement and cubic estimation

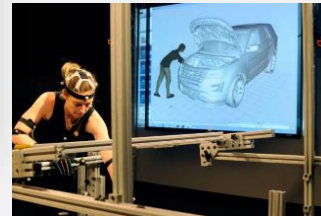**Data Analytics for Packaging Data Accuracy & Availability**

RFID Scanning for Track & Trace

Near

Augmented Reality for Rack Validation using 3D Models

Virtual CLL Alignment using Chalk

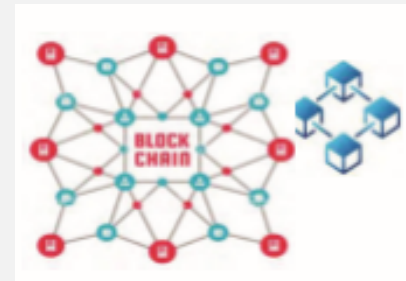**Virtual Ergo Assessment**

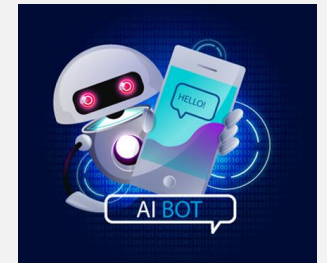**Mobile App with OCR Bar code Reading**
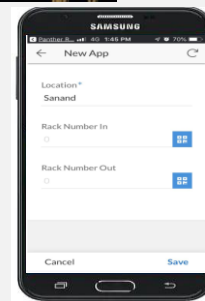
Chat Bot For Supplier Queries

Far

Digital Twin for Asset Management

Block Chain

AI / ML for Rack Reuse Decision

Thank You

👤 Balakrishnan A.S.

📱 +91-9940660034

✉ abalakri@ford.com

Summary / Insights Required.

- How do you see the new technologies associated with material flow and packaging engineering (MFPE) impacting the automotive Industry?

- Indicate the key drivers of logistics automation in the context of MFPE?

- Importance of the error free packaging labelling in logistics.

- Highlight the benefits and obstructions of logistics automation associated with MFPE in the current pandemic situation (COVID-19).

- Does your firm use (or) plans for any other low-cost technology solution for the logistics automation?

- Describe the MFPE considerations towards electric and autonomous vehicles (EV/AV) in your firm(s).

- Explain the various measures been taken to control the landfill for the expandable packaging in your firm(s)?