REVERSE LOGISTICS

Enhancing Core Management Decisions

Remanufacturing Industries Council

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http://remancouncil.org/

Vaughn Henson | General Manager | SRC Logistics, Inc.
Vhenson@SRCLogisticsinc.com

Remanufacturing – Sustained Value

*The U.S. Postal Service and Department of Interior both informed the GAO that they have **reduced** repair and maintenance **costs** by utilizing **remanufactured** vehicle components.. In addition to the cost savings, **remanufacturing** has **environmental benefits** as well.*

Postal Service Fleet**:** **211,264** vehicles, one of the largest civilian fleets in the world.

Remanufacturing – Sustained Value

*The **United States** is the **world's largest** producer, consumer, and exporter of **remanufactured goods**.*

… the value of US remanufactured production had reached **$43 billion** by 2011, supporting approximately **180,000 full-time jobs**.

--- *U.S. International Trade Commission*

Advanced Remanufacturing

- Modern remanufacturing depends on advanced **manufacturing** technologies and controls:
  - ISO Certifications
  - Safety programs
  - Metal additive techniques
    - Spray welding , metal deposition, etc
  - Clean rooms
    - HEPA filters, micron tolerances
  - Fuel injectors ~ 30,000 psi
  - Electronics
    - Precision and ruggedized electronic applications
    - ECM’s, sensors, video displays

No Core, No Reman… man.

- Core availability can be **impacted:**
  - Who has the cores?
  - What cores are available?
  - When are the cores available?
  - Where are the cores?
  - Flexing core values impacts supply vs. demand

It's Coreplicated

- Core values have elasticity
- Defect deductions change behaviors
  - Need more core? Adjust the value.
- Core processing
  - What if credits were given within 48 hours?
  - What if freight was automated for dealers?
  - What if status was visible, available real-time?
  - What if pictures of defects were sent back to dealers and used for training?

Coremplications – Keep Digging

- When are the cores available?
  - What if cores were tracked during transportation?
  - What if shipping requirements / weights could be updated in real-time?
- Where are the cores?
  - What if customized alerts could be generated and sent to dealers, core buyers, scrap yards, etc.?
  - What if your system produced a geo-map of core locations?

Reman Needs

- Market analysis
  - Value created by satisfying customer needs.
- Engineering - technical capabilities
- MRP - Raw materials (cores)
- Marketing, sales, etc.
- Just like Manufacturing:
  - Management support
  - Entrepreneurial spirit is a must

Core Control

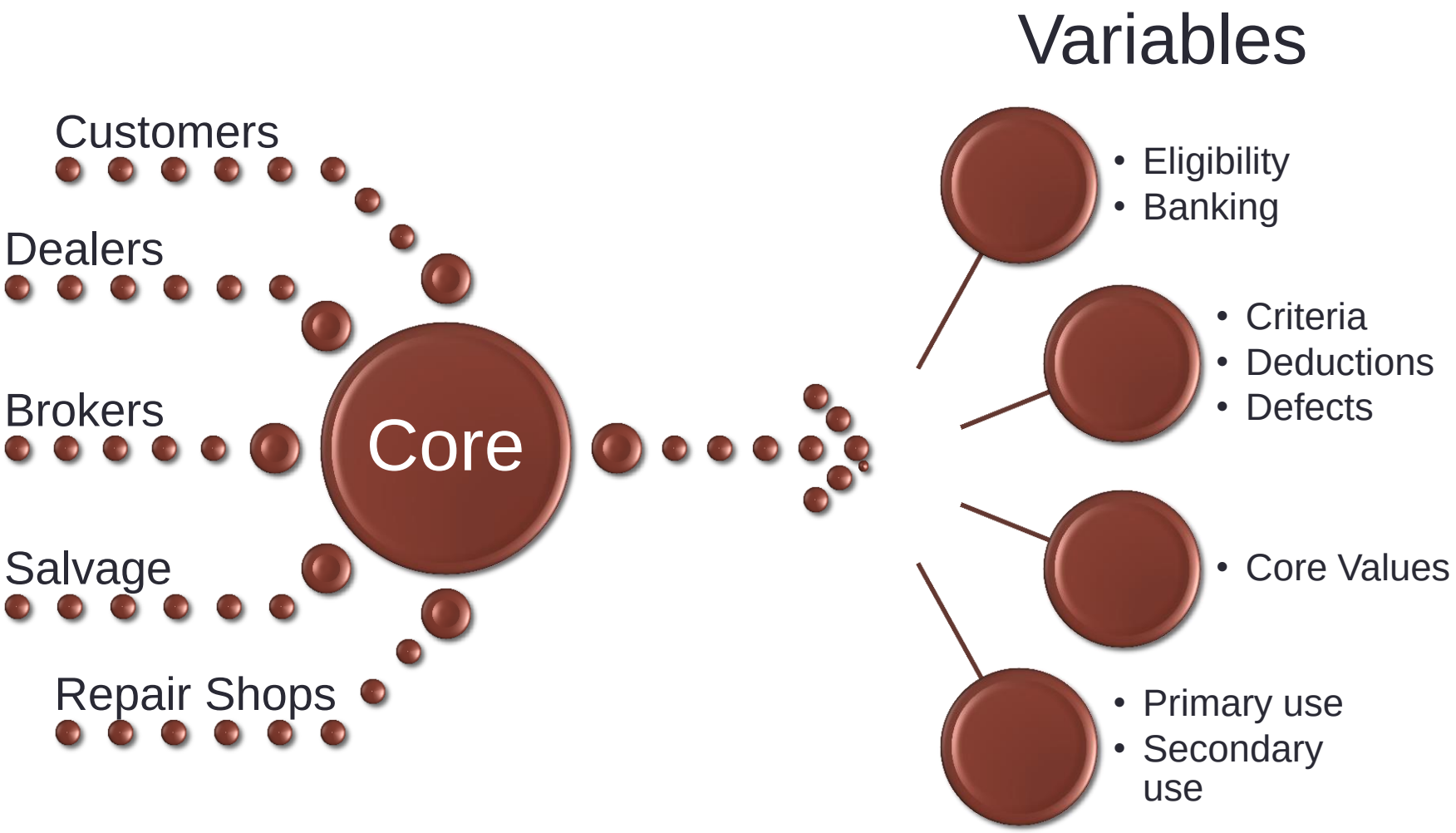
- Who owns the core, owns the market
- Who understands core, survives and thrives in the market!

- Survey results: primary method to forecast core availability is:
  - **Management Opinion**
  - How good is your opinion at predicting availability?

Core Chaos - It depends…

Variables	Sources
Eligibility with suppliers	Customers (millions)
Eligibility for dealers	Dealers (thousands)
Criteria transparency	Core Brokers (hundreds)
Core banking	Salvage Yards (thousands?)
Core deposit vs delayed invoicing	Core Round-ups
EPA, Warranty tracking	Parts Peddlers
Owes and Dues	Repair Shops (130,000+ auto shops)
Core criteria deductions	Secondary / substitutes
Fall out ratio	Reclass new

Sources and Uses



Data Overload

- One OEM's experience:
  - 1,200,000 annual core requirements
  - 1,000 source locations
  - 10 defect codes avg.
  - **12 Billion data combinations**

    (McDonalds took 20 years to sell 12 Billion burgers!)

  - Additional tracking needs:
    - Changes to values, eligibilities, criteria, etc.

Freight Logics

- Freight to collect core can be significant. Costs are not always visible. Freight optimization yields continuous savings.
  - Single vs. Multiple locations:
    - Low value cores: brake shoes, are typically collected at multiple locations.
    - **Multiple** points throughout a system
    - High value cores: large engines, typically collected in a **central** location.
    - Creates economies of scale and efficiencies for in-bound freight, inspections, expertise, storage and distribution.

The S in SRC

- Results of Navistar's comprehensive freight study identified Springfield, MO as the optimal location for Remanufacturing operations, including core collections and processing.

- Springfield is the population center of the U.S.

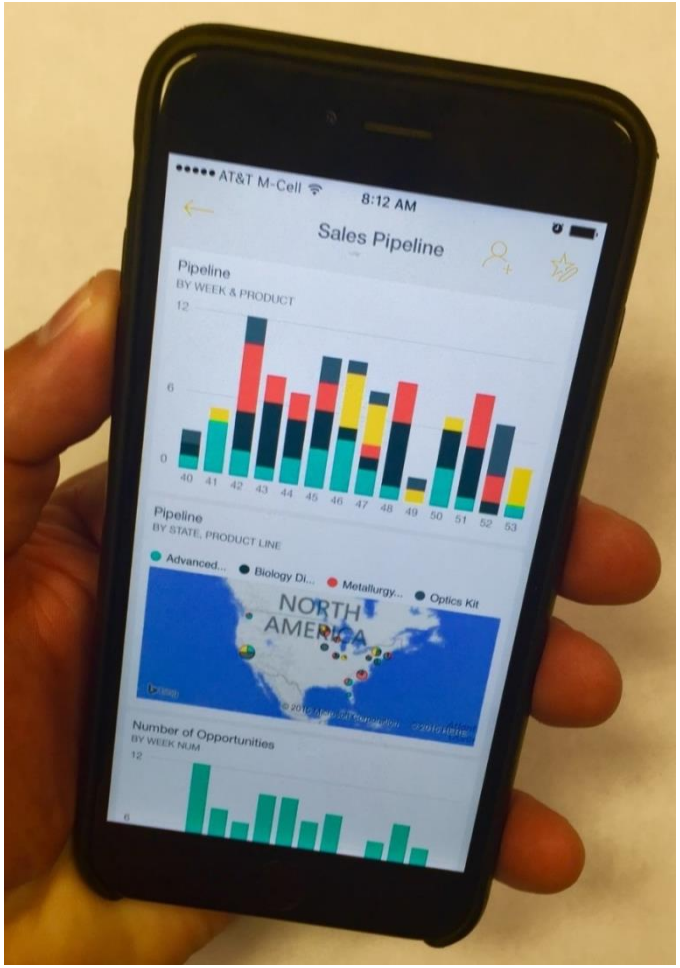
- Find your sweet spot! Impact is long-lasting.

LRC ?

- Springfield is **NOT** the geographical center… Lebanon, KS is… but, there's no warehouse.

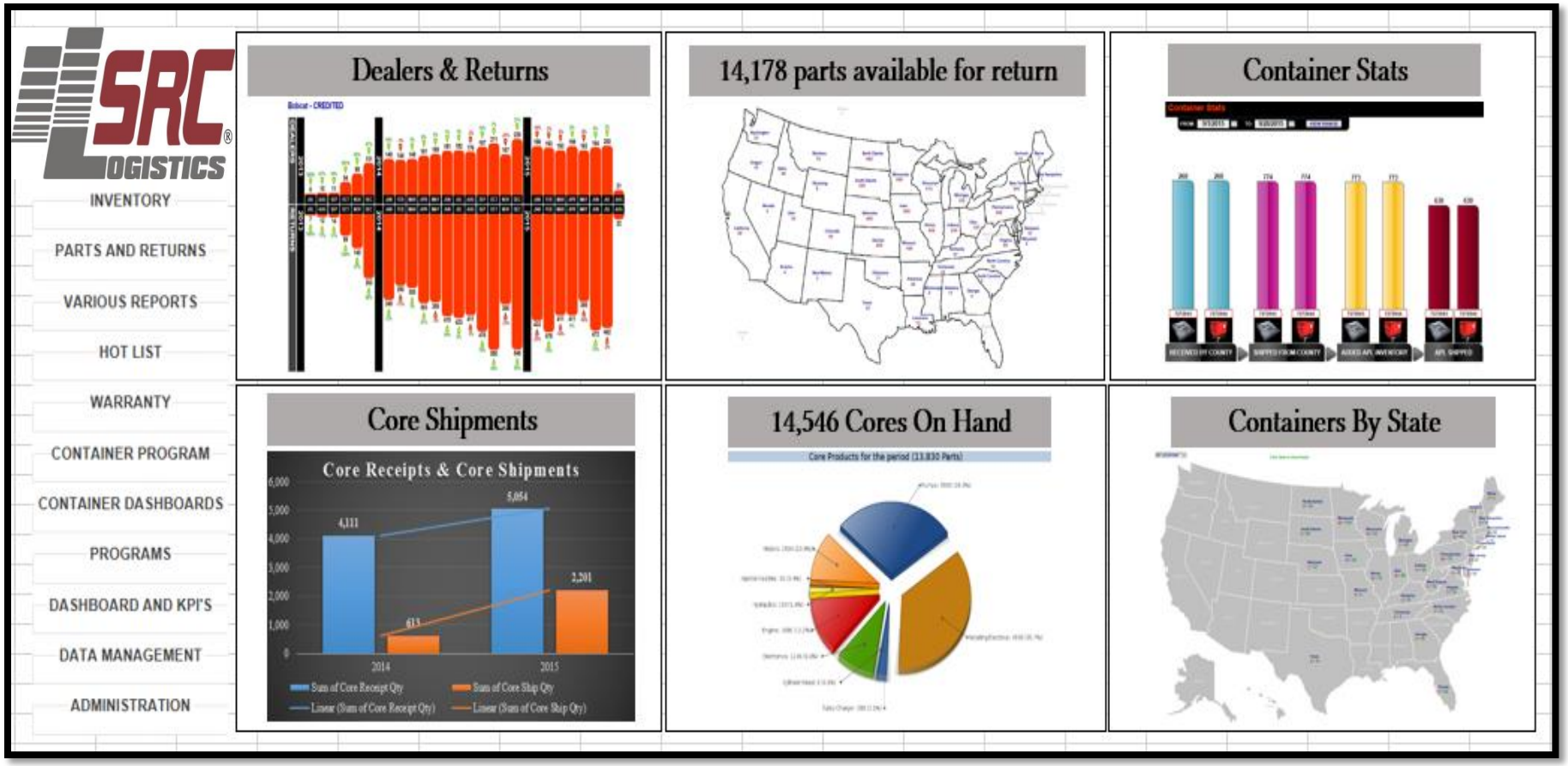
Core Reporting

- Dashboards!
- Develop and control data centrally to ensure integrity
- Disperse the data to support decisions and transparency
- Dashboards!



Core Reporting

- Data wants to tell a story



Data-Driven Core Management Platform

- Freight Management
  - Reverse logistics / receiving / tracking
- Core Processing
  - Criteria and defect inspection
  - Inventory accuracy, material recovery / scrap
  - Warranty testing
- Distribution
  - Pick / Pack / Shipping
- Other
  - Core availability **forecasting**
  - Compliance, EPA tracking support, audit trails
  - Reporting, Dashboards, queries
  - Data **integration** with other systems

Future Enhancements

- Image capture, recognition, inspection
- Integration
  - Warehouse / inventory management
  - Pick / pack optimization
  - Distribution and tracking
- Advanced bar codes
- RFID (metal parts in bins…maybe not)
- Dashboard reporting