2006 Canadian RFID Conference

SHARING THE FACTS; DISPELLING THE MYTHS.

RFID

RADIO FREQUENCY IDENTIFICATION

Workshop:

RFID in Manufacturing

Moderator:

Vanessa Chris, Associate Editor

Advanced Manufacturing

Speakers:

Katherine van Nes, President

Cougar Automation Technologies Inc.

Bob Moroz, President

R. Moroz Ltd. – RFID Canada

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Katherine van Nes

President

Cougar

Automatic [illegible]ogies Inc.

Cougar

automation technologies inc.

Workshop: RFID in Manufacturing

Katherine van Nes, P.Eng.,
President – Cougar Automation Technologies Inc.

Introduction

RFID in Manufacturing

- *Presented by: Katherine van Nes, Cougar Automation*
- Learn the value of RFID and what it can bring to manufacturing
- See what other companies are doing to achieve those benefits
- Find out how RFID is implemented in harsh and challenging environments

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RFID in Manufacturing

- Trends in Manufacturing
- Data and it's Value
- Opportunities and Applications
- Project Implementation
- Next Steps – Project Starter Kit
- Questions

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Trends in Manufacturing

- Changes to health and safety, labour, & environmental requirements.
- New regulatory, security or customer requirements.
- Increased product variations with smaller production runs.
- Lower inventory levels.
- Decreased COGS.
- Improved Overall Equipment Effectiveness.

Data and Its Value

How can RFID technology address manufacturing challenges?

…Data

- Too much…too little.
- “Right Data, Right Time, Right Place”.
- “Accurate, detailed, timely data”.

Data and Its Value

Who requires the data and when…

- Operations Team.
- Quality Team.
- Floor Personnel.

- *Being Data Enabled*

Criteria for a Data Enabled Enterprise™

Manufacturers who:

- Experience bottlenecks.
- Desire traceability through a process.
- Desire traceability of item life cycle.
- Want to reduce labor required for material or asset management and replenishment.
- Want to reduce data entry errors.
- Require product authentication.
- Operate in a regulated environment.
- Hazardous or challenging environmental conditions.
- Business systems or software applications require r
  info than other forms of data capture can pr

Data and Its Value

Why is manufacturing *(versus Supply Chain)* in a better position for a positive ROI?

- Closed loop environment
- Process automation infrastructure.

Bridging the Gap

Between the
Manufacturing Execution System
and the Production Floor

Opportunities for RFID “Data Enabling”

- Security and Safety
- Production Execution and Quality Control
- Product Tracking and Genealogy
- Inventory Tracking and Visibility
- Asset Management


Goals
Innovations
Applications

Opportunities and Applications

Security

Security

- Authorized Access Only
- Tracking Access
- Scope of Access
- Document Security

Security

Specific Opportunities for RFID:

- Link user, machine and task together, to verify that only qualified and properly equipped people are maintaining/operating the equipment
- Know what employees have done which task in case of quality or safety issue; improvements to SOPs
- Know where all employees are on site to maintain safety.

“OPEL”
GM Assembly

Access Control and Quality System

Opportunities and Applications

Production Execution

And Quality Control

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Quality Control
“the untapped opportunity”

Production Execution & Quality Control

Specific Opportunities for RFID:

- Correct labor, machine, tool and components available and ready.
- Tracking, verification and validation of processes.
- Control, modify and reconfigure process steps based on inbound materials and assemblies.
- Avoidance of line and product contamination.
- Enabler for statistical and root cause data analysis.
- Document tracking.
- Increase ROI on MES/ERP systems.

“Pierrel-Ospedali”

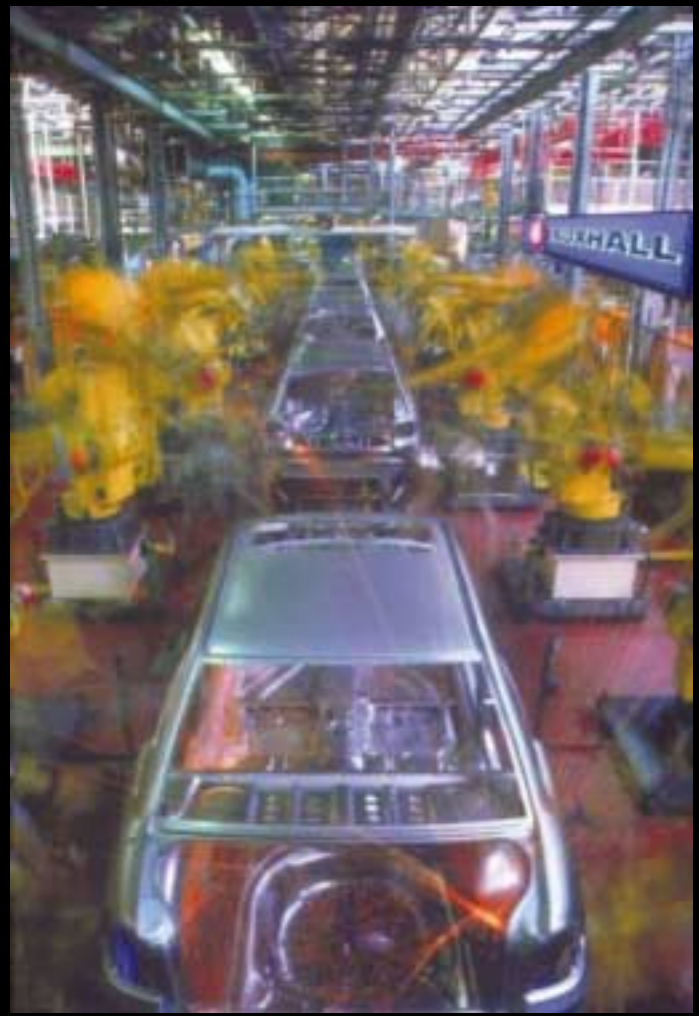
Process Monitoring and Validation System

“United Biscuits”

Raw Material Tracking and Process Control System

“BMW”

Flexible
Automobile
Manufacturing
System



Opportunities and Applications

Product / Material

Tracking & Genealogy

Product / Material Tracking & Genealogy

- Increased requirements for reporting
- Recalls

Product/Material Tracking & Genealogy

Specific Opportunities for RFID:

- Genealogy tracking.
- Regulatory compliance with product tracking.
- Batch / lot control and tracking.
- Recall with surgical precision.
- Material safety.

“Northern Fine Foods”

Raw Materials and Product Tracking System

“Trelleborg Industrial AVS”

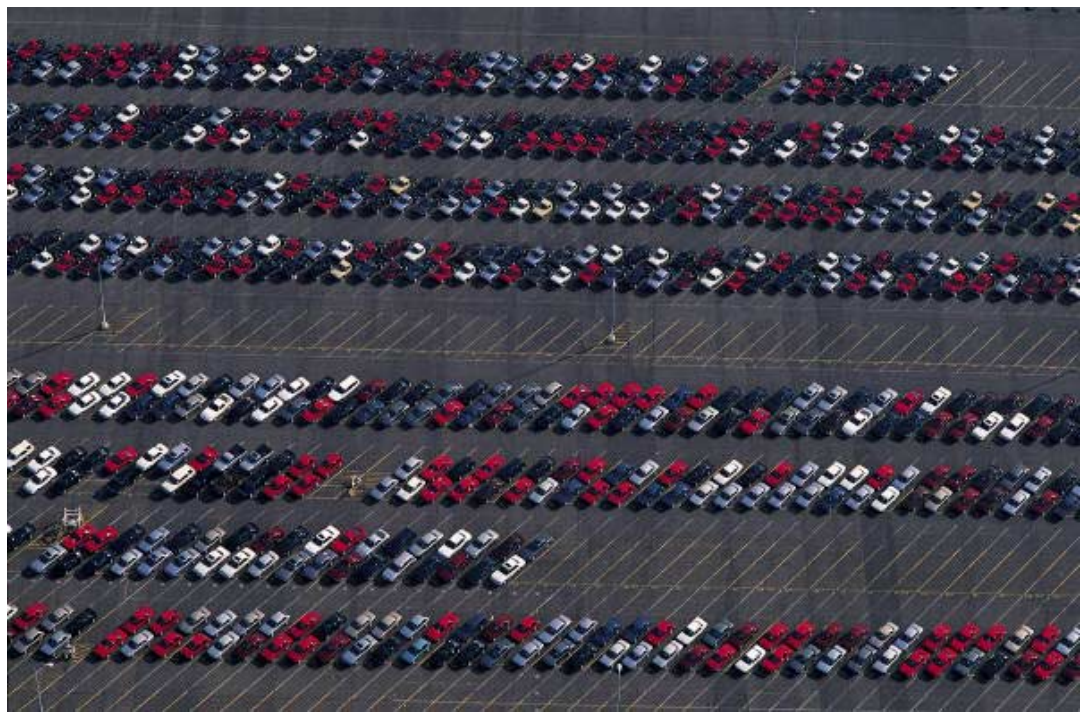
Compound Identification, Tracking and Control System

“Wells Dairy”

Batch Tracking System

Opportunities and Applications

Inventory Tracking and Visibility



Inventory Tracking & Visibility

- Lean manufacturing and Just-In-Time.
- True supply chain synchronization, internal as well as external.

Inventory Tracking & Visibility

Specific Opportunities for RFID:

- Visibility to inbound raw materials and urgent components
- Control and visibility of WIP tracking
- Replenishment
- Production sequencing.

“Noblenza Piccardo”

Automated Tracking and Inventory System

“Paramount Farms”

Receiving System

Opportunities and Applications

Asset

Management

Asset Management

- Track and trace for bins, totes, trucks, machines
- Collect data (where asset is, maintenance status)
- Driver for OEE utilization
- Detailed , accurate and timely data for Computerized Maintenance Management Systems (CMMS)

Asset Management

Specific Opportunities for RFID:

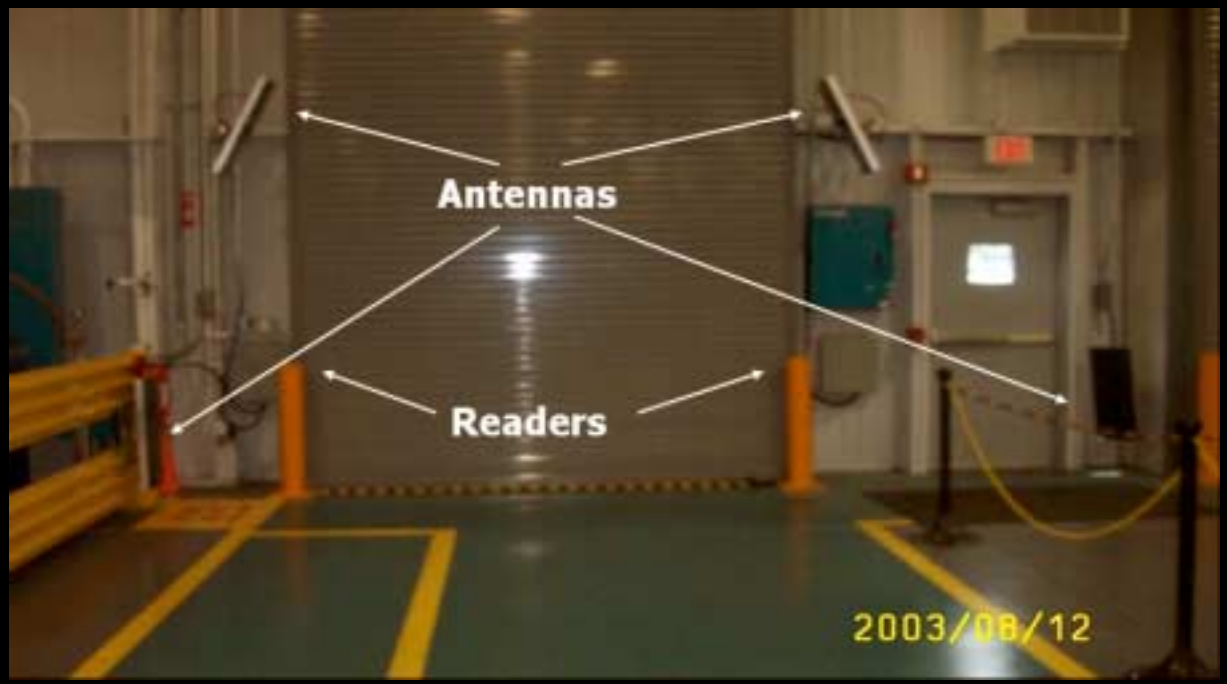
- Reusable Asset Utilization
  - Impact of availability of assets to production
  - Track and trace reusable assets thru supply chain
  - Better visibility to each asset
- Maintenance Repair and Overhaul
  - Tracking of significant events in the life of a piece of equipment
  - Audit trail of critical operations used by equipment
  - Can make planned downtime more productive
  - Can reduce unplanned downtime by supporting predictive maintenance triggers.

“Paxko”

Asset Management System

“Boeing”

Asset Tracking System



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No single tool is
right for every job

Project Implementation

"For an RFID project to succeed, it is necessary to approach the business problem and potential RFID solution using a systems approach"

"RFID systems should be conceived, designed, and implemented using a systematic development process in which end-users and specialists design RFID systems based on an analysis of the business requirements of the organization"

Project Implementation

Questions to ask:

- What is the goal to be achieved or the problem to be solved?
- What specific data is required when and where?
- How far downstream into manufacturing and out into the supply chain should RFID be implemented?
- How far upstream and at what level of granularity and into the production process should RFID be implemented?
- What types of standard, software, and integration should be deployed?

Do the Right Things…

8-Step Process

- Clearly define the objectives
- Education and awareness
- Analyze the business case
- Determine the technology solution
- Do a pilot
- Analyze results, ROI
- Roll out a point solution, department level and enterprise
- Keep analyzing and improving

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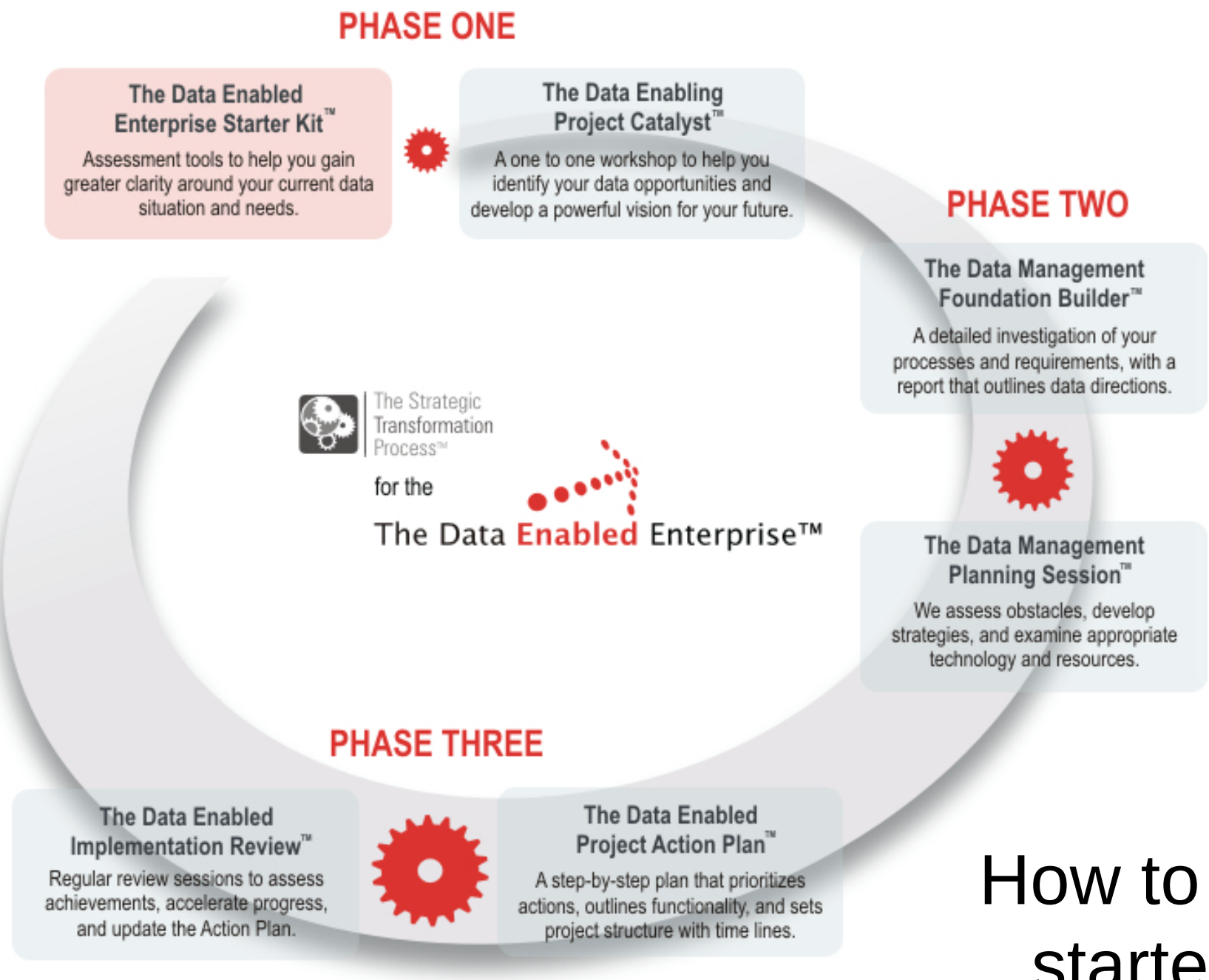
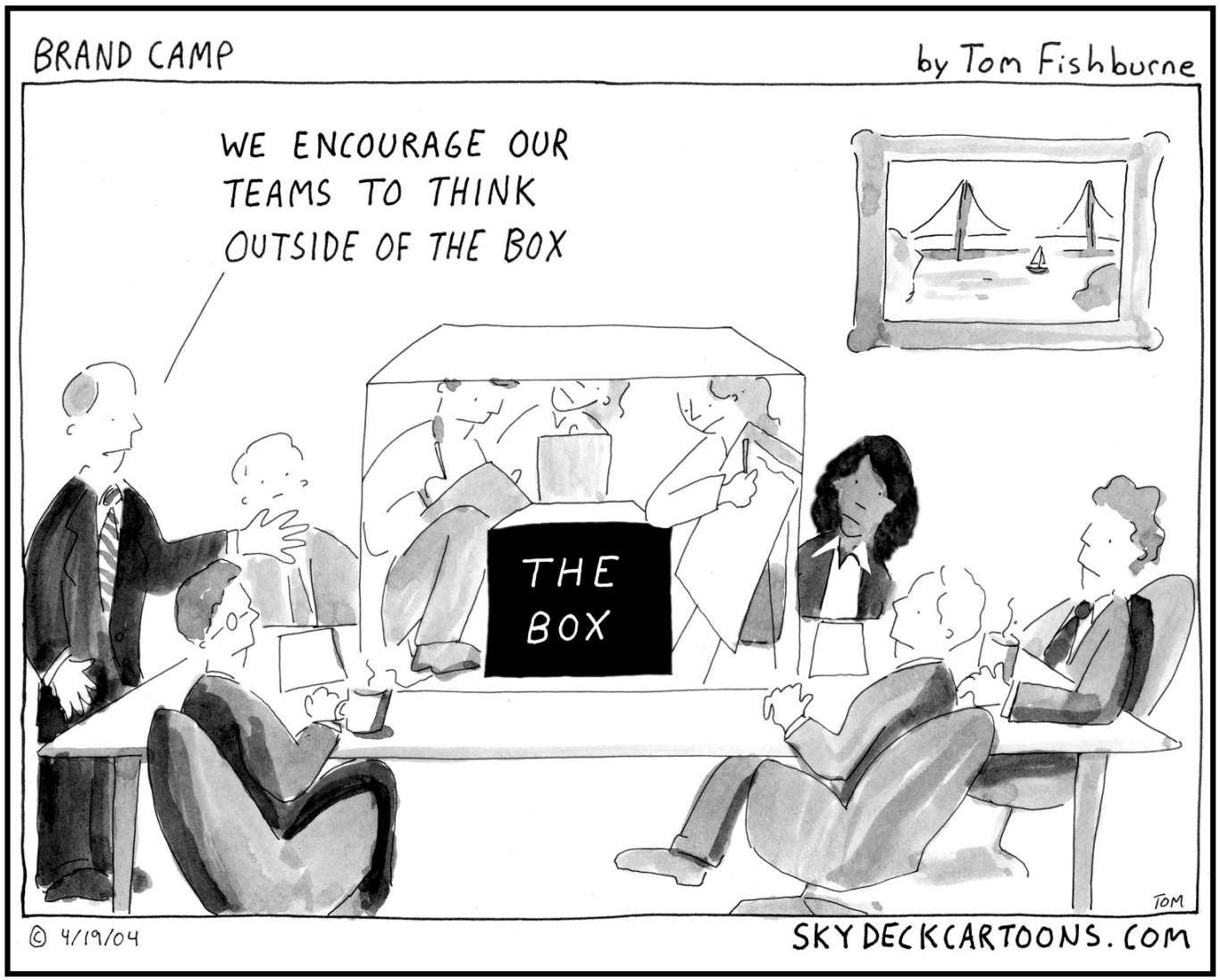
Consider a Data Enabling Review™

- Adapt your existing infrastructure to create a “Data Enabled” production facility.
- Apply data collection, integrity, & storage strategies that work.
- Integrate your industry specific and other software.
- Maximize data collection & usage without data loss.



How to get started…

Think outside the box, not inside a fishbowl.



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BARCODING RFID AND BEYOND

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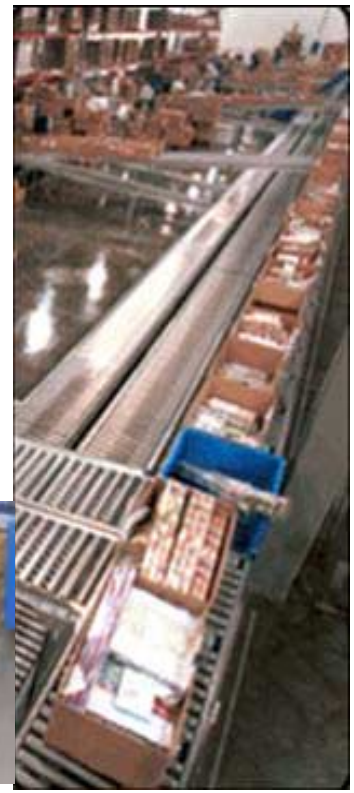
MANUFACTURING APPLICATIONS

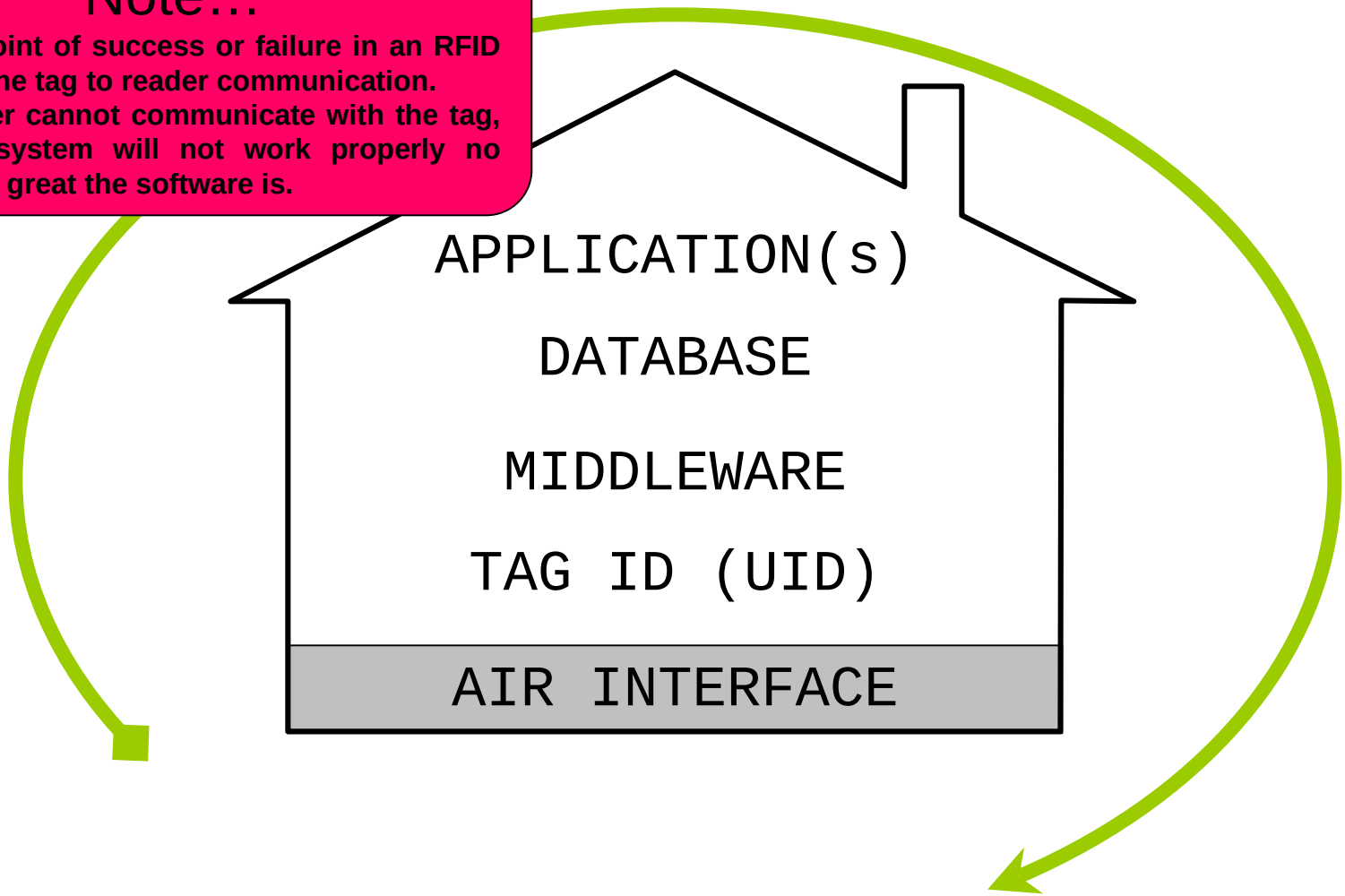
- Work-In-Process (WIP)
- Asset Tracking
- Maintenance
- Inventory Control
- Supply Chain



RFID SYSTEM

Note…

The first point of success or failure in an RFID system is the tag to reader communication.
If the reader cannot communicate with the tag, the RFID system will not work properly no matter how great the software is.



Features of RFID

- RFID Tags can be read from a distance and from any orientation
- Tags can have read and write capabilities
- Data can be changed dynamically at any time
- RF-Tags can be read in bulk very quickly
- Does not require line of sight to be read
- RF-Tags can easily be embedded into any non-metallic products
- Works in harsh environments
- Permanent Identification for the life of the product

RFID is a highly reliable technology to identify and track items using RF communication

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Benefits of RFID

- Reduce product handling time
- Reduce errors
- Reduce shrinkage
- Improve product visibility
- Reduce out-of stock
- Improve shipment identification
- Provide security against counterfeiting and tampering
- Optimize inventory
- More accurate and timely information
- Reduce costs

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Challenges of RFID

EMI - Electromagnetic Interference

- Ambient and Intrinsic Noise

Surrounding Material and Elements

- Metal, Liquid, Elements such as Rain, Fog and UV
- Absorption, Reflection, Refraction, Diffraction

•Mechanical

- Shock, Vibration, Bending

•Safety

- Human saf… …vironments

•Temperatu…

Note…

Manufacturing is a challenging environment.
Not one RFID technology is the solution for all Applications.

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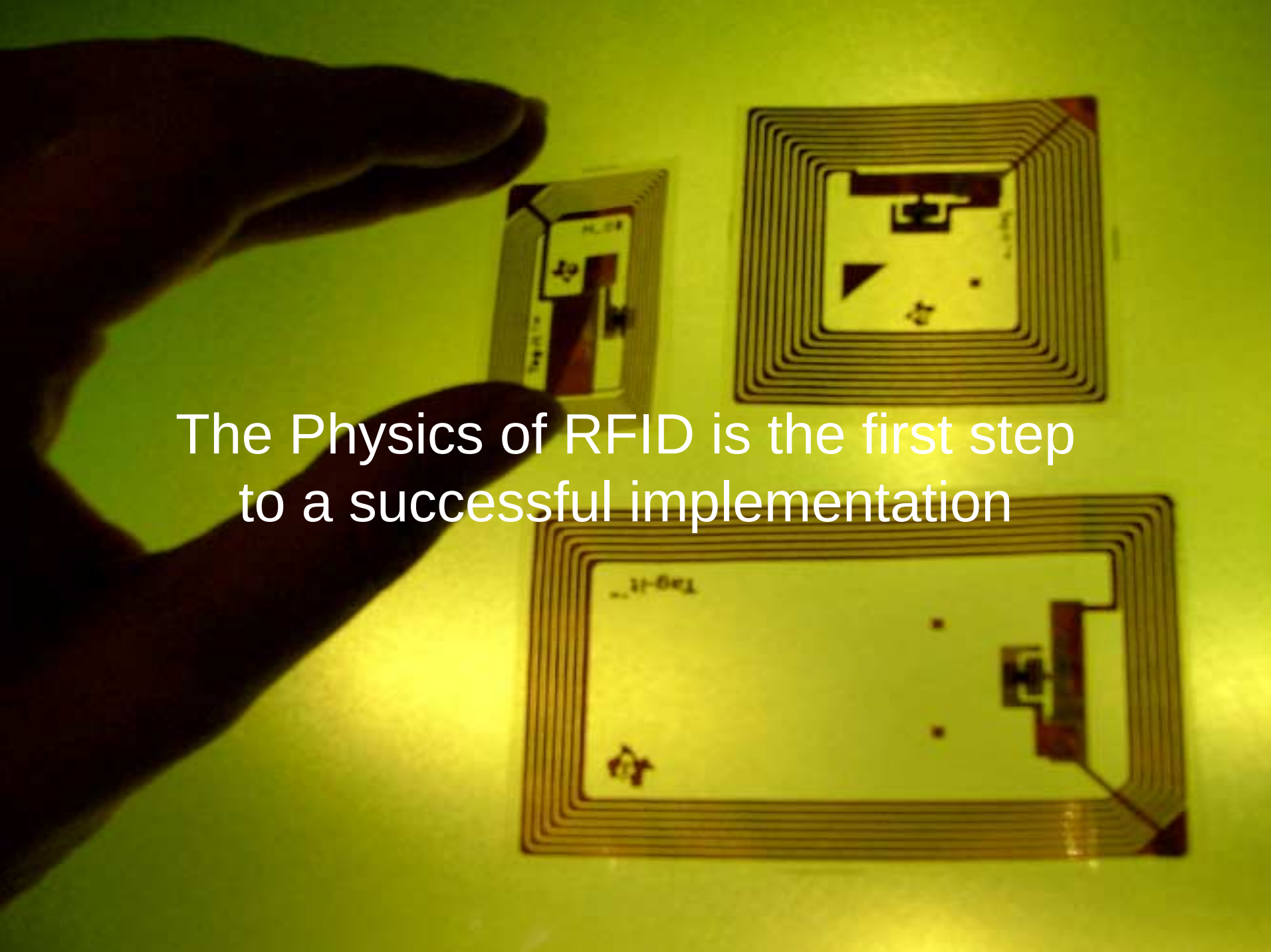
The Physics of RFID is the first step
to a successful implementation

System Survey

- Business:
  - Why are you implementing RFID?
  - Are you being mandated or are you looking at improving your internal operation?
  - Is there a requirement or preference for standards?

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System Survey

- Tags:
  - Do you require disposable tags or can you use reusable tags?
  - Type of tag required (Read only, R/W, WORM)?
  - Maximum amount of data to be stored in the tag (data capacity)?
  - What is the data format?

- Reader:
  - What is the required read zone (width, height, and depth)?
  - How may tags will the reader read or write to at one time?
  - What are the possible location(s) for the tag?

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System Survey

- Reader (cont.):
  - Orientation of the tag?
  - Distance between tags?
  - At what speed and direction will the tags be travelling?
  - What error control and correction will be required?
  - Do you require any data security?
  - What will the required distance be between different reader antennas?
  - What is the distance between antenna location and the reader?
  - Is portability a requirement?
  - Data interface and protocol – reader/interrogator (batch, on line, wireless, Ethernet, etc.)?

System Survey

- Environment:
  - Environment: Metal, Tags and reader antenna proximity to metal?
  - Temperature, humidity, and exposure to chemicals, UV and X-rays, mechanical stress?

- Systems:
  - How and where will the tags be applied?
  - What do you do when a tag is read?
  - What do you do if a tag is not read?

Note…

System Implementation survey can be found in RFID Canada's white paper entitled "Understanding RFID" at www.rfidcanada.com

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Simple Exercise

Seat of the Pants	Real World Awareness
(Decisions based on inadequate, inaccurate or stale information)	(Information needed to make better decisions)
• *Equipment Failure*	• *Usage Report (Hrs, Unit of Production)*
RFID can be used to monitor and generate warning before problems occurs	
• *Need Containers*	• *Inventory Report (Location, Customer)*
RFID can be used identify and track containers by tracking in and out movement	

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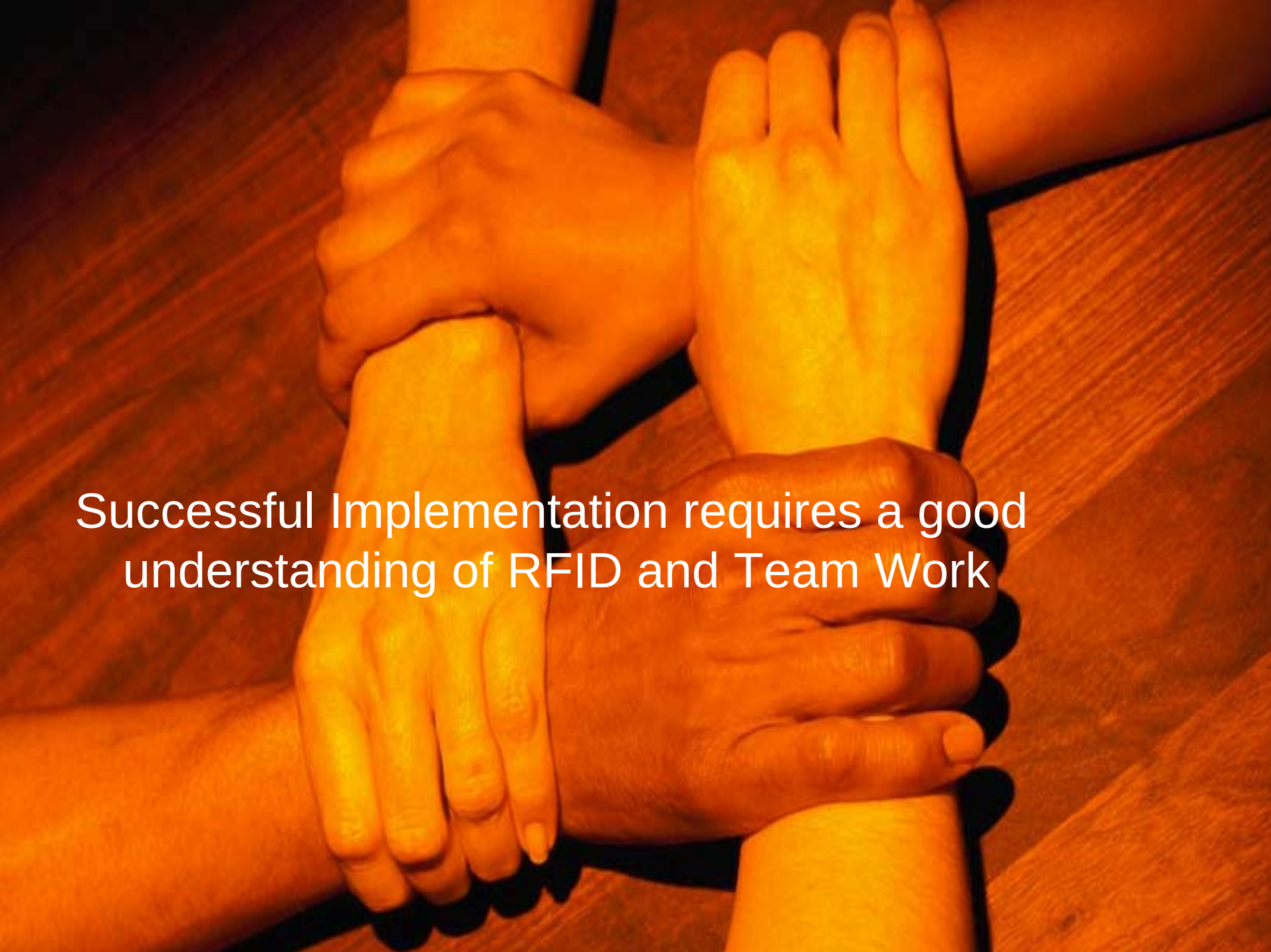
Successful Implementation requires a good
understanding of RFID and Team Work

Questions ?