

Unleash Your Workforce!

Sponsored by:

Intermec[®]

Presented by:

Arvin Danielson, Chief
Technology Officer

Bruce Stubbs, Industry
Marketing Director

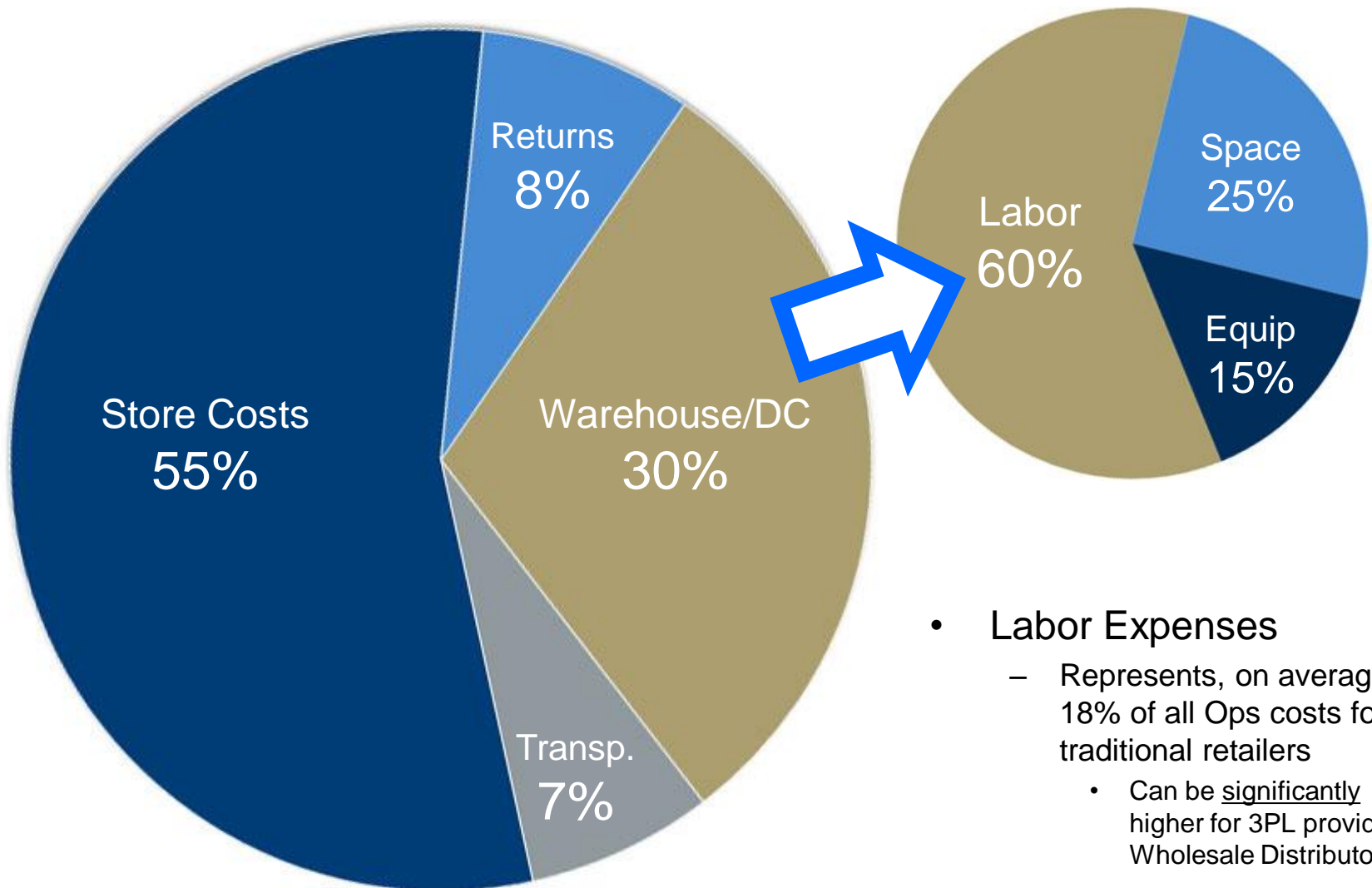
 **PROMAT** | 2013
AN MHI INTERNATIONAL EXPO
McCORMICK PLACE CHICAGO JAN 21-24
www.ProMatShow.com



MHI

2013 MHI™ Copyright claimed as to audiovisual works of seminar sessions and sound recordings of seminar sessions. All rights reserved.

Why Workforce Focus?



- Labor Expenses
 - Represents, on average, 18% of all Ops costs for traditional retailers
 - Can be significantly higher for 3PL providers, Wholesale Distributors



Productivity

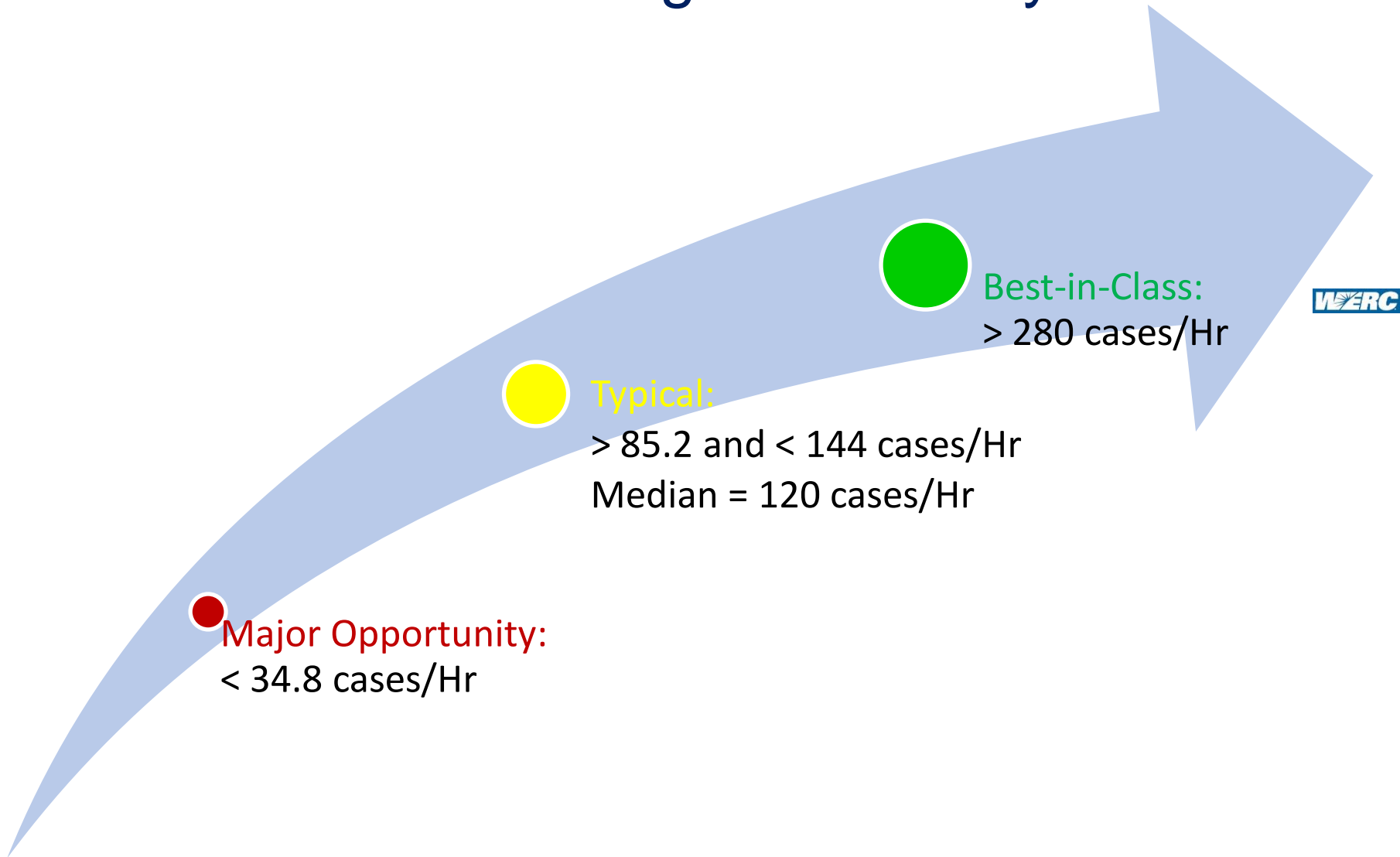


Accuracy



Wellbeing

Order Picking Productivity



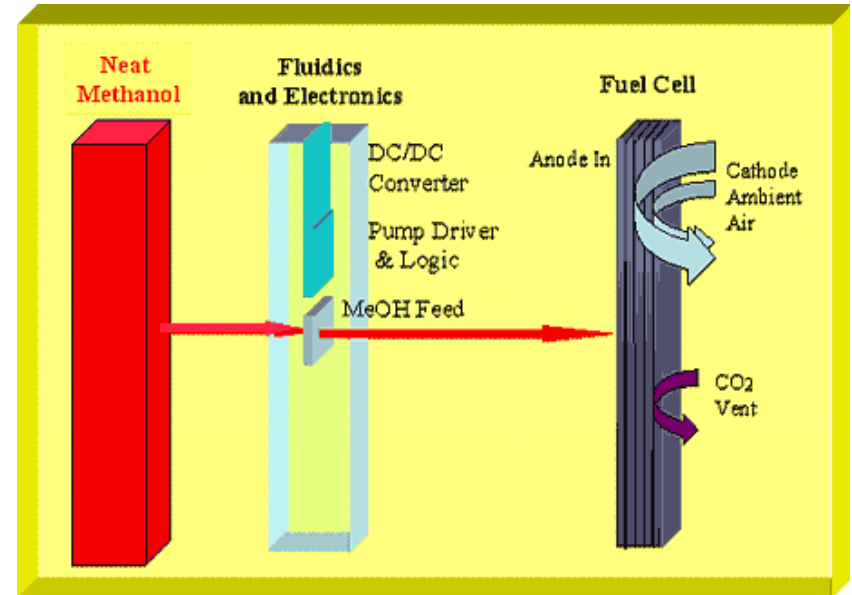
State of Mobile Computer Power Technology

- Mobile Computer Battery Technology
 - Driver of Size and Weight
 - Trade-off Size/Weight vs. Runtime
 - Greater Runtime Needed for Mission Critical Applications
 - Optional Extra Capacity Battery Pack (Competitive Answer)
 - Spare Battery Pack on Route (Just-In-Case)
 - In-Vehicle or Mid-Shift Charging (Costly)
 - Number One Factor in Total Cost-of-Ownership
 - Wear-Out every ~500 cycles (18mo-24mo)
 - Management Cost \$\$\$
- FUTURE??????



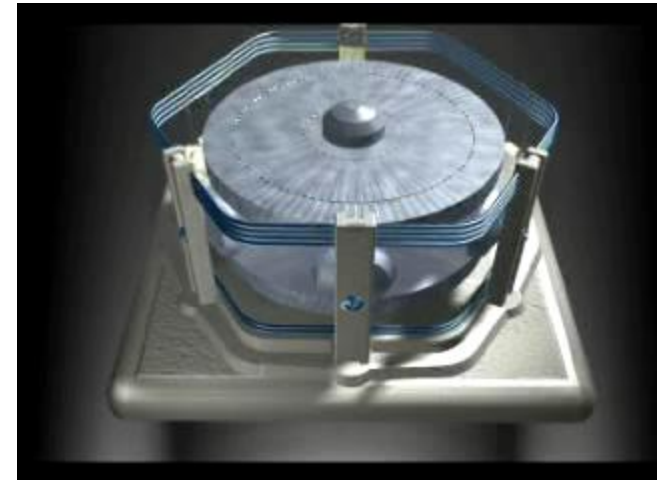
Future Mobile Computer Power Source?

- Power Generator Technology
 - Fuel Cell Generator
 - Solar Generator
 - Kinetic Energy Generator
 - Energy Harvesting Technologies



Generator Technologies are Years Away from Reality!

- Today's Solution
 - Power Efficient Mobile Computer Architectures



Recent Innovations

Advanced Multi-Engine Computing Architecture



Just to name a few...

Multiple Engines Running Multiple Tasks

- Right processing engine for the right task
- Highly responsive
- Flicker-free video and click-free audio during multitasking
- Most power-efficient architecture

Superior battery life performance

- Increases daily runtime
- Extended battery runtime at sub-zero temperatures
- Reduces battery deep discharge cycle wear out
- Extends useful life of batteries

Ultra Low Power (ULP) Wireless

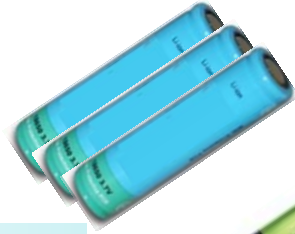
- Fundamentals
 - Bluetooth Low Energy (BLE)
 - Operates 2.45GHz & coexists with WiFi and Bluetooth
 - Operating range of 20m or less
- Optimized for low power & long battery life
 - Average current draw of 10-50uA
 - No mesh capability to save power
 - Short bursts of data typically a few hundred bits or less
 - Provides identity or sensor/actuator information
- Specifics
 - ANT: GFSK modulation w/ 1 Mbps data rate (non-hopper)
 - BLE: GFSK modulation w/ 1 Mbps data rate (hopper)

The Power of Ultra Low Power Wireless

“Longer Life on Less Energy”

WLAN

Hours



200 mA

WPAN

Days



50 mA

ULPW

Years



50 μ A

- Ultra Low Power Wireless current draws are 4000x less than most WLAN technologies.
- Ultra Low Power Wireless current draws are 1000x less than most WPAN technologies.

Proof of Concept: Indoor Location

■ Proposition

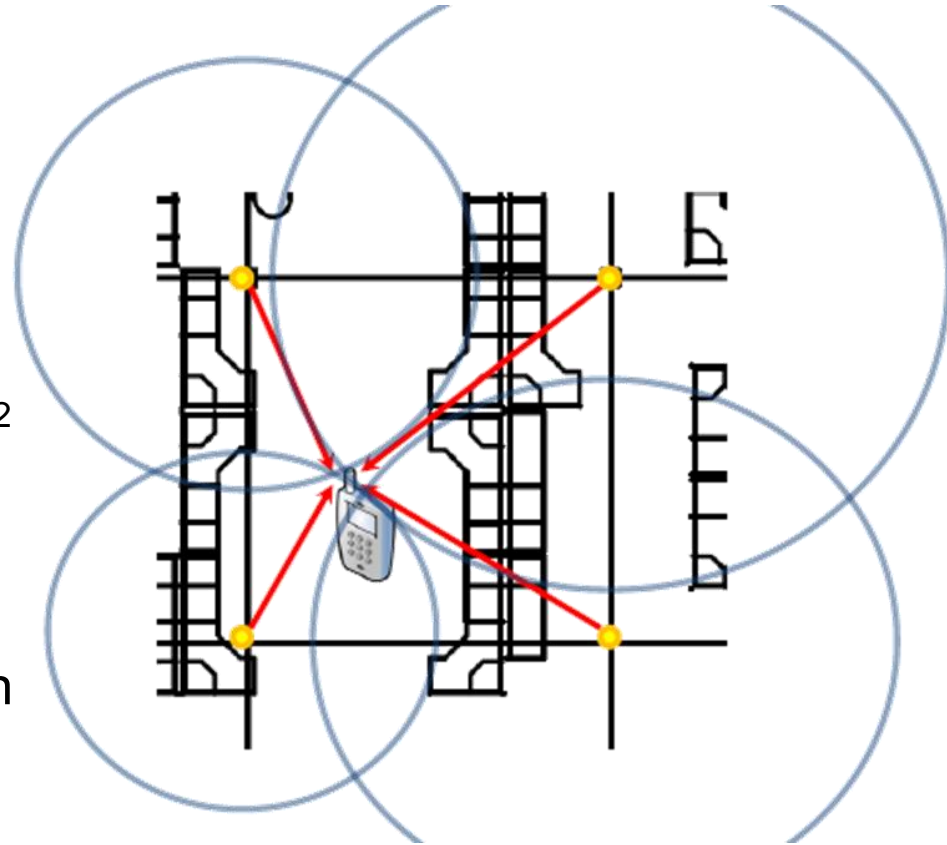
- ULPW well suited to locate operators with mobile computers

■ Hardware

- Mobile computers
- Multiple ultra low power tags placed at 7m grid over 2500m²

■ Advantages

- Low cost
- Fair ($\leq 2m$) resolution based on simple RSSI measurements
- Compatible with Consumer equipment





Productivity

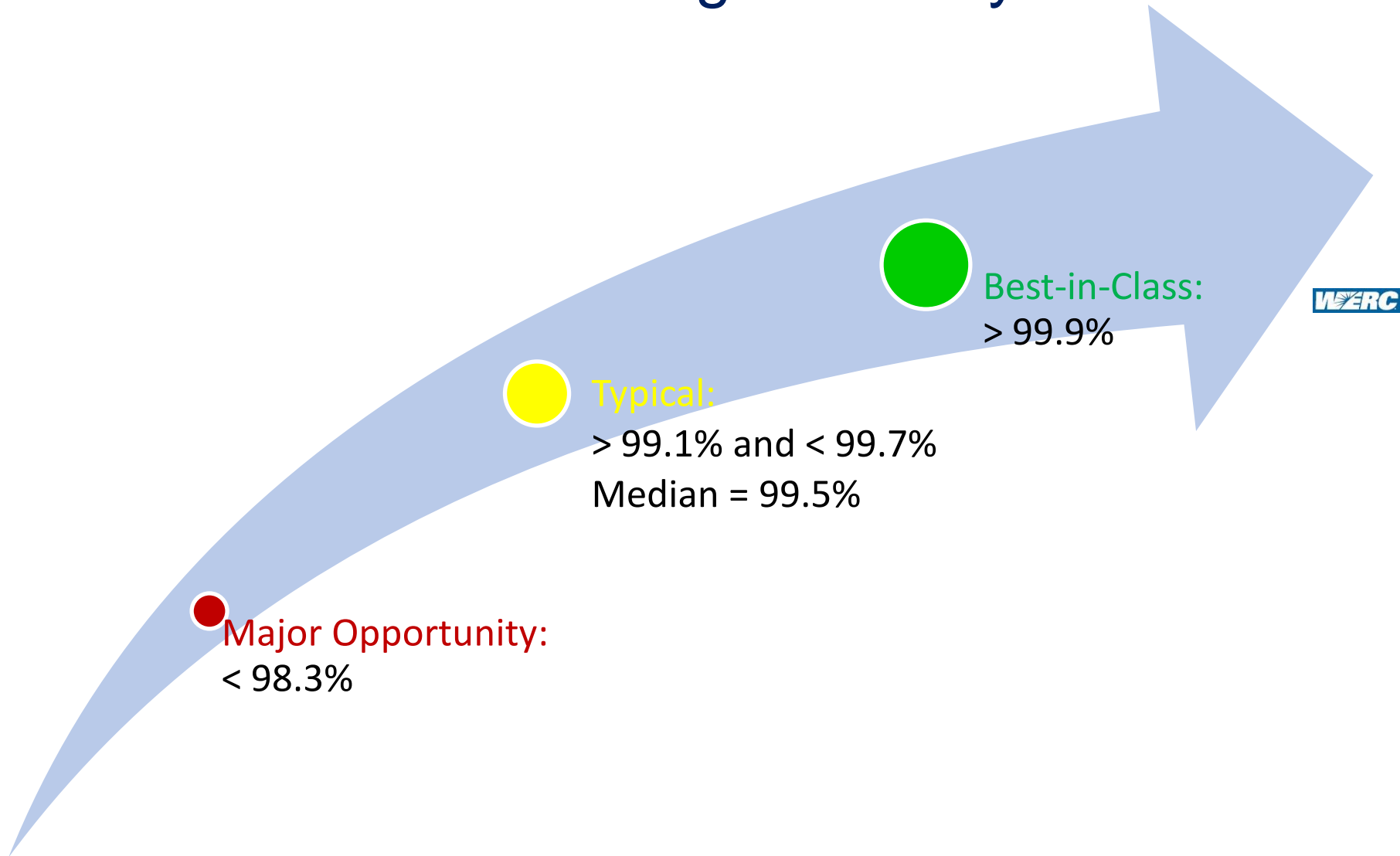


Accuracy



Wellbeing

Order Picking Accuracy



Innovations in Imaging Technology

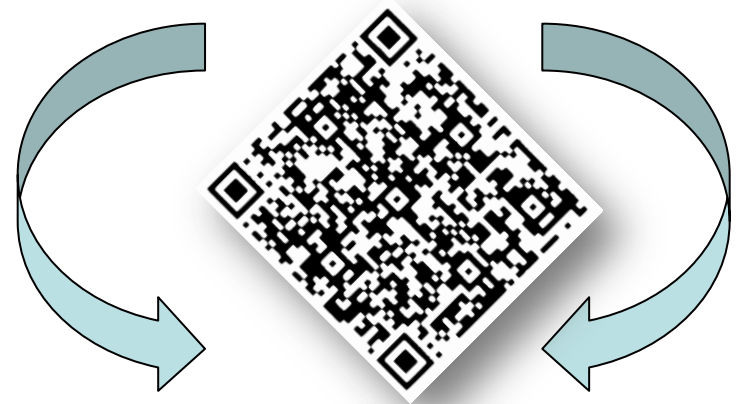
■ Leading Barcode Technology

- 1D/2D Barcodes
- Damaged Barcodes
- Any Orientation
- Barcode-on-screen
- Near/Far Field Barcode Reading
- Motion Tolerance 1D/2D
- Outdoor Applications



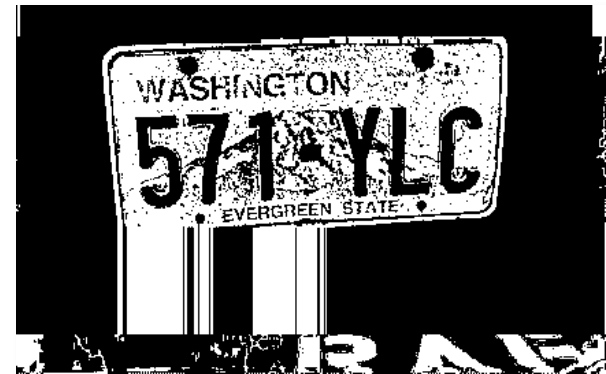
■ Technology Innovation Curve

- Digital Camera Technology Curve
- Mobile Processor Signal Processing



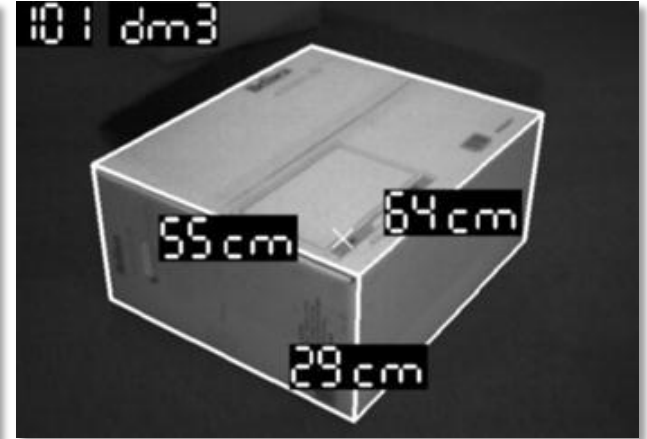
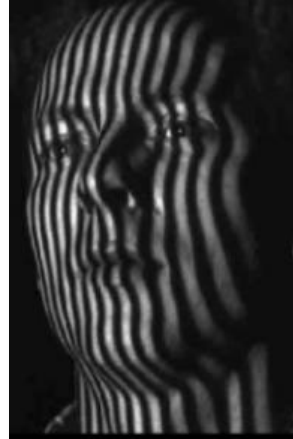
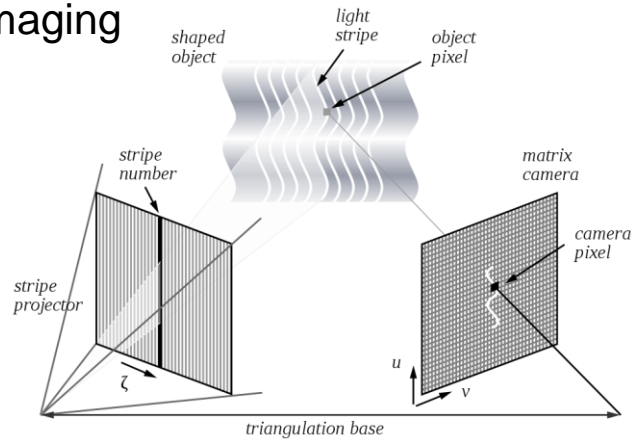
Imaging Beyond Barcode

- Enhanced Mobile Document
- Delivery address verification
- Optical Character Recognition



Imaging Future

3D Imaging

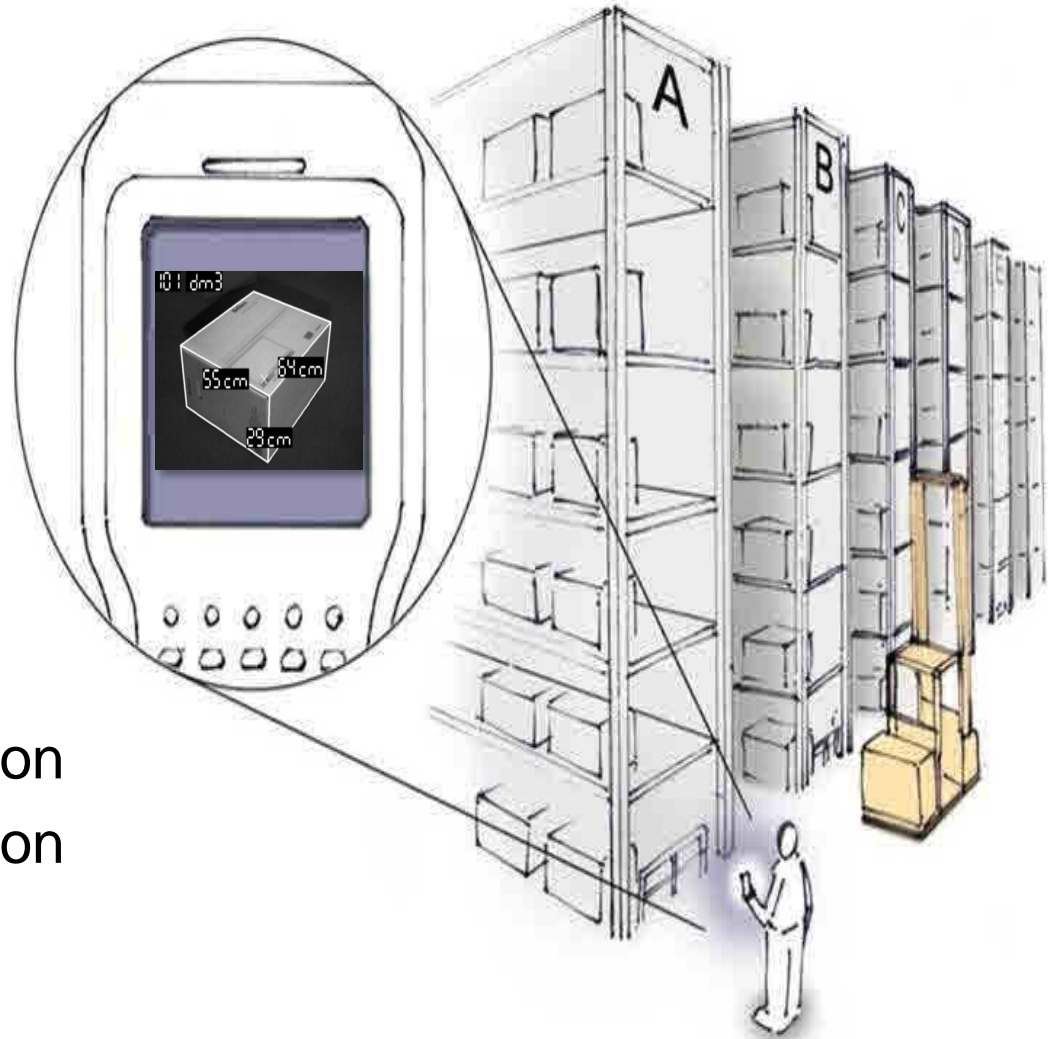


3D Imaging Application Environments

- Transportation, Parcel & Freight
 - Load Planning
 - DIM Pricing
 - Trailer Capacity Utilization



3D Imaging Application Environments



- Distribution Center
 - Dynamic Space Utilization
 - Container Cube Utilization

3D Imaging Application Environments

- Direct Store Delivery/Retail
 - Rack Capacity
 - Load Efficiency
 - Shelf Management





Productivity

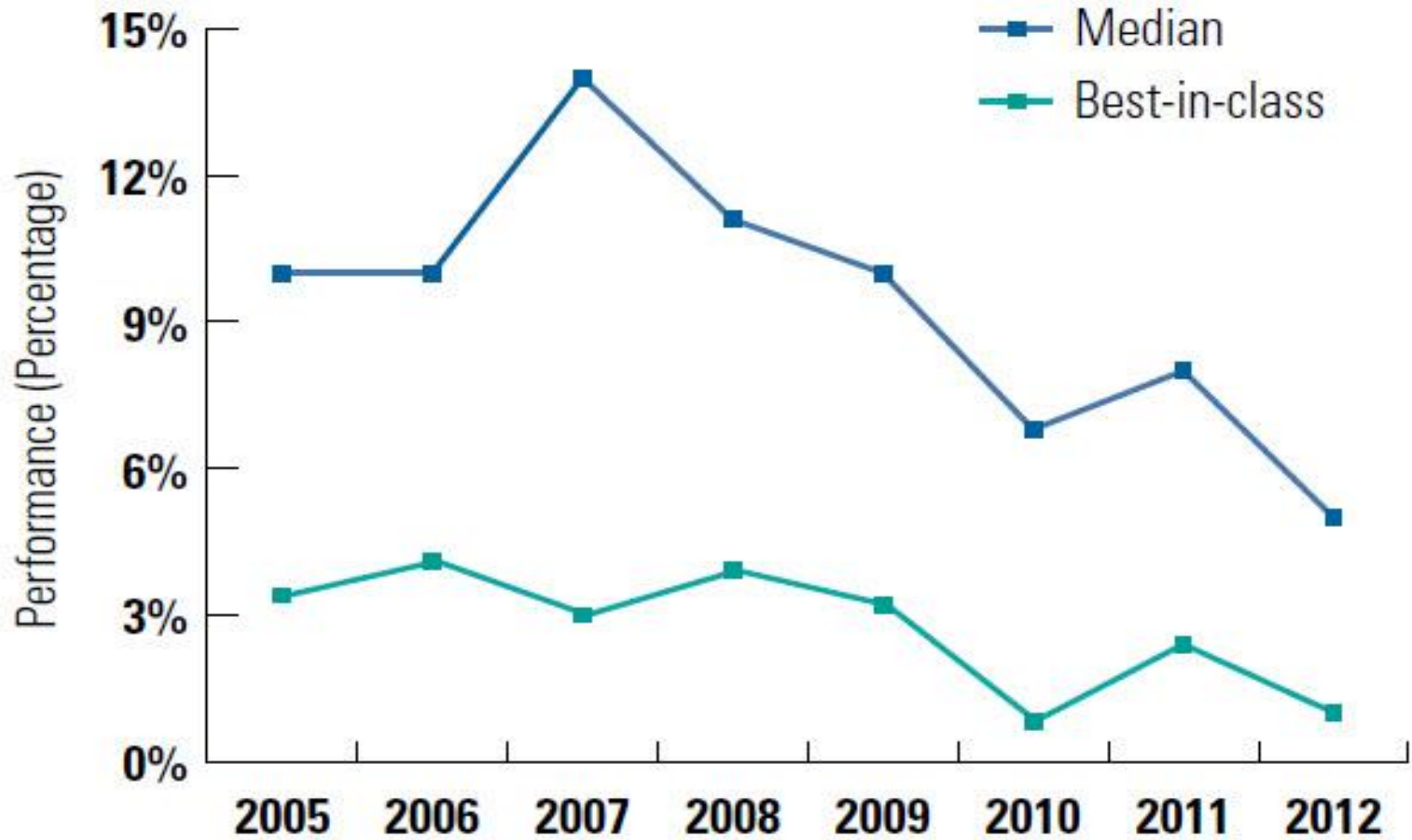


Accuracy



Wellbeing

FIGURE 8. ANNUAL WORKFORCE TURNOVER



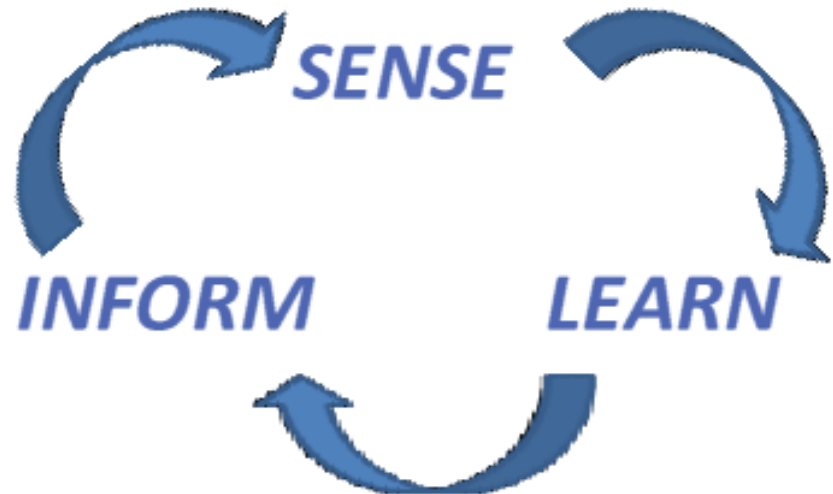
Mobile Computer Form-Factor Dilemma

- Drivers of Rugged Handheld Form Factor
 - Fit for Application
 - Directed Workforce
- Drivers of Rugged Handheld Size
 - Batteries
 - Ruggedness/Reliability
 - User Interface
 - Display
 - Keyboard



Man/Machine Interface

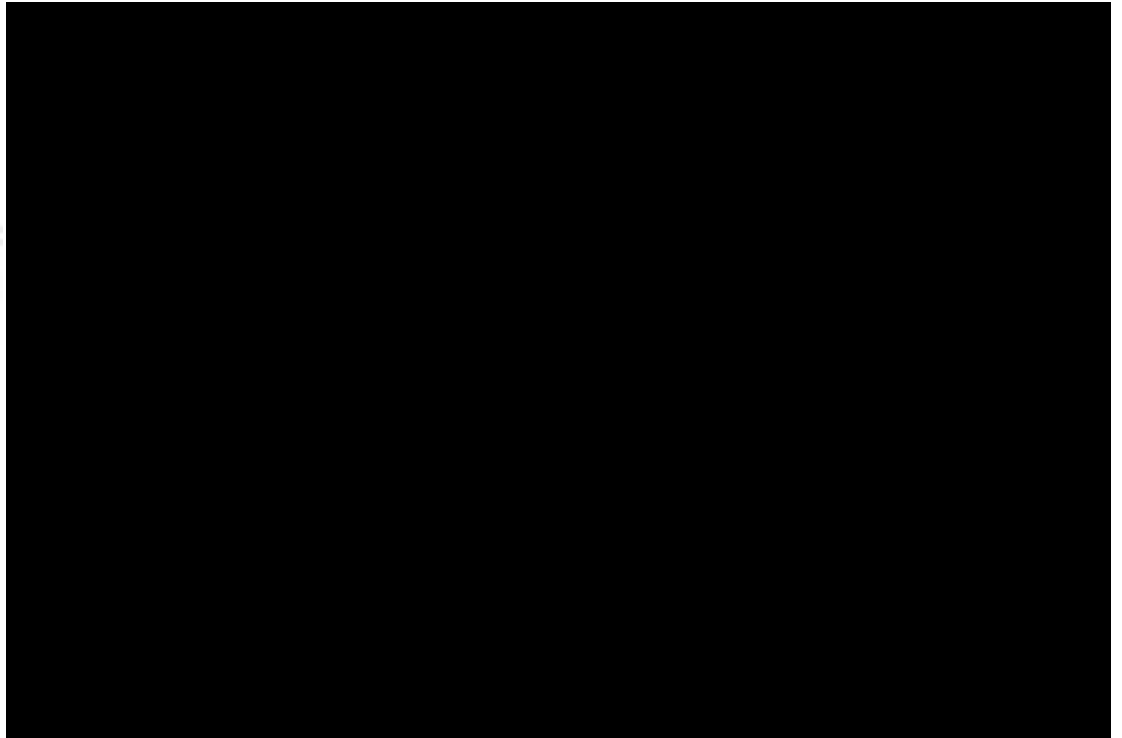
- Today
 - Human Interfaces with Computer
 - Keyboard Input
 - Display Output
 - Computer is a tool controlled by human
- Future
 - Human Integrated with Networked Computing Environment
 - Internet-Of-Things Intelligent Environment
 - Natural Human Interface
 - Voice
 - Hearing
 - Touch
 - Gesturing
 - Vision
 - Sensing



Internet-of-Things

- Integration of the Physical & the Virtual World
- Intelligent Environment:
 - From Identification, To Data, To Information, To Knowledge
 - 50 Billion connected intelligent devices by 2020
 - 35 Trillion gigabytes of data produced annually by 2020

Future?





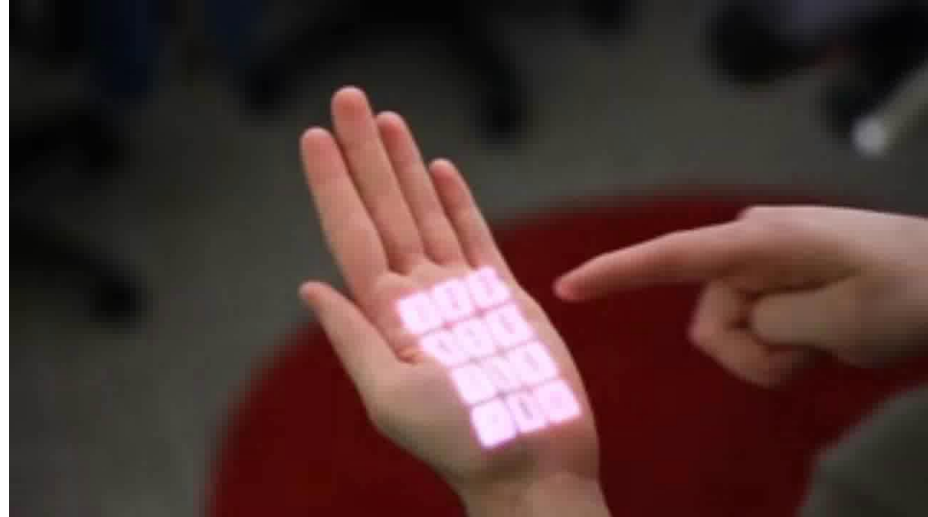
Future Human Interface

- Control
 - Voice
 - Sensors
 - Gestures (Eye, Hand, Head, Body)



Future Human Interface

- Keyboard
 - Voice
 - Virtual Projected



- Display
 - Projected
 - Heads-Up



Future Human Interface

- Data Capture
 - Look & Capture Imaging



Soon, you won't have to
imagine!



Thank You!

For More Information:

Speaker: arvin.danielson@intermec.com

Home Page: www.intermec.com

Speaker: bruce.stubbs@intermec.com

Home Page: www.intermec.com

Visit ProMat 2013 Booth 3964