Strategic Innovation: Converging Themes

in

Auto ID Sensor Networks

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Innovation Strategy

Systems-based problems (not “tool” driven)

A hammer only looks for nails!
ASN is a broad spectrum ICT platform that has the depth and breadth to enhance applications where auto id and sensing contributes to decision support systems for real-world problems.
In this strategy the objective is not to use any one specific tool but to improve the decision making process in systems where confluence of multiple technologies (auto id using various types of RF and remote sensing) offers value and may help create innovative products, services, applications.
Auto-ID Sensor Networks

Vertical Areas of Application
Auto-ID Sensor Networks

Vertical Areas of Application

Common Horizontal Functions
Auto-ID Sensor Networks

Manufacturing

Energy

ENERGY
Auto-ID Sensor Networks

Manufacturing  Energy  Security

SECURITY
Auto-ID Sensor Networks

Manufacturing  Energy  Security  Healthcare

HEALTHCARE
Auto-ID and Sensors in Mesh Networks

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Auto-ID Sensor Networks

- Agriculture
- Retail
- Inventory
- Forecasting
- M
- E
- S
- H

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Auto-ID Sensor Networks

Agriculture | Inventory | Inventory | Sourcing | S | H
Retail | Forecasting | Ecology | Security |

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Auto-ID Sensor Networks

Value Chain Network

- Agriculture
- Inventory
- Retail
- Forecasting

- Ecology
- Security
- Law
- Risk

- Sourcing
- Customs
- Ports
- Monitor

- Identifying
- Metabolism
- Security
- Risk

- Inventory
- Forecasting
Auto-ID Sensor Networks

Value Chain Network

Supply Chain and Logistics Operations

Intelligent Decision Support
<table>
<thead>
<tr>
<th>Sensors for Temperature, Humidity, Nitrates</th>
<th>Visibility of objects in supply chain</th>
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</thead>
<tbody>
<tr>
<td>Track and Trace of Food Supply Chain</td>
<td>Receiving and Distribution</td>
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<tr>
<td>Temperature of Perishables in transit</td>
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<tr>
<td>Soil and Fertiliser Analysis</td>
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<td>Animal and Farm Waste</td>
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<td>Biofuels</td>
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| Real-time data in supply chain           | Data Analytics                      |
| Reduction of out-of-stock                | Metrics                             |

**Forecasting**

**Retail**

**Inventory**

**Agriculture**

**Forecasting**

**Visibility of objects in supply chain**

**Receiving and Distribution**
Sensors for Temperature, Humidity, Nitrates

Track and Trace of Food Supply Chain

Temperature of Perishables in transit

Soil and Fertiliser Analysis

Animal and Farm Waste

Biofuels

Visibility of objects in supply chain

Receiving and Distribution

Forecasting

Retail

Agriculture

Inventory

Data Analytics

Metrics

Value Chain Network

Supply Chain and Logistics Operations

Intelligent Decision Support

Enterprise Systems

Real-time data in supply chain

Reduction of out-of-stock
Optimizing inventory to demand

Biofuels: Biodiesel, Ethanol, Methane
Retrobiosynthesis of Pentanol
Metabolic Engineering

Environmental Monitoring:

Gas Sensors

Inventory  Sourcing

Ecology  Security
Real-time law enforcement

Advance Shipping Notice
Bill of Loading Manifest
Inspection

Continuous risk analytics
Risk alert communication

Law
Customs
Risk
Ports

NVOCC Network
Logistics
Real-time law enforcement

Advance Shipping Notice
Bill of Loading, UCR
Inspection
Release

Value Chain Network
Supply Chain and Logistics Operations
Intelligent Decision Support
Enterprise Systems

Continuous risk analytics
Risk alert communication

NVOCC Network
Logistics
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- Asset ID
- Patient ID
- Prescription ID
- Pharmaceutical ID

- Real-time Remote Sensing
- Metabolomics Assessment

- Value Chain Network
- Supply Chain and Logistics Operations
- Intelligent Decision Support
- Enterprise Systems

- Identify
- Metabolism
- Monitor
- Response

- Patients
- Emergency
- Ambulatory Support

- Nurse-Physician Network
- Hospital-Home Communication
- Real-time Sense and Respond System
Auto-ID Sensor Networks

Value Chain Network

Supply Chain and Logistics Operations

Intelligent Decision Support

Enterprise Systems
Auto-ID Sensor Networks

- Manufacturing
- Energy
- Security
- Healthcare

Value Chain Network
Supply Chain and Logistics Operations
Intelligent Decision Support
Enterprise Systems
Technology

Application

Value

Partners

Test
Auto-ID Sensor Networks

Technology

Application

Value

Partners

Test
Auto-ID Sensor Networks

Technology
Auto-ID and Sensors: Technologies

- RF
- GPS
- Sensors
- Networks
- Protocols

- FF RFID (125KHz, 13.56 MHz, 902MHz)
- Ultrawideband (UWB)
- FF Readers
- Software Defined Radio (SDR Readers)
- GPS
- Sensors (mems, nano, micro-analyzer, EKG)
- Sensor Network (scalability, power, MANET)
- Network Transmission as Computation Cost
- Protocols (802.11b, 802.15.4, 802.16a)
Auto-ID Sensor Networks

Technology

Application

- RF
- GPS
- Sensors
- Networks
- Protocols
Auto-ID Sensor Networks

Technology

Application

RF
GPS
Sensors
Networks
Protocols

Use Case
Scenario
Benefits
System
Auto-ID Sensor Networks

Technology

Application

Value

- RF
- GPS
- Sensors
- Networks
- Protocols

- Use Case
- Scenario
- Benefits
- System

- Current
- Enhancement
- Transformation
Auto-ID Sensor Networks

Technology

- RF
- GPS
- Sensors
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Application

- Use Case
- Scenario
- Benefits
- System

Value

- Current
- Enhancement
- Transformation

Partners
Auto-ID Sensor Networks

Technology

Application

Value

Partners

Test

RF
GPS
Sensors
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Protocols

Use Case
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System

Current
Enhancement
Transformation

Industry
Academic
Organizations
Collaborations

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- RF
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- Use Case
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- Current
- Enhancement
- Transformation

- Industry
- Academic
- Organizations
- Collaborations

- Tools
- Platform
- Implementation
Additional Information

• [http://groups.google.com/group/shoumen/files?hl=en](http://groups.google.com/group/shoumen/files?hl=en)

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