New Trade Landscape

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Three Trade Characteristics Rising in Importance

1. Information Security Management Systems
2. Supply security
3. Authentication

Together: Security Assurance
1. Information Security Management Systems (ISMS)

- Formalize information security, provide harmonizing platform
- Enterprise-wide perspective
- Scope defined by organization and commercial agreements
- Focus: information assets, risk exposure, response
- Affects:
  - Management policy, personnel, confidential and financial information, business records access, physical access to facilities, information and communication technologies and their use, document and data management
1. International ISMS Standards

- **ISO/IEC 27001, 2005-10-15 Ed. 1**
  Information technology — Security techniques — Information security management systems — Requirements

  Information technology — Security techniques — Code of practice for information security management

- **ISO/IEC 27006, 2007-07-01 Ed 1**
  Information technology — Security techniques — Requirements for bodies providing audit and certification of information security management systems

- Under development: **ISO/IEC CD 27005**
  …. Security techniques — Information security risk management

See www.iso.org

- Formalize supply security, provide harmonizing platform
- Transport and customs perspective—movement/access
- Scope defined by organization and commercial agreements
- Focus: supply and transport security, risk exposure, response
- Affects
  - Physical access to facilities, freight security and monitoring, personnel, confidential and financial information, business records access, document and data management
2. International SSMS Standards

- **ISO/PAS 28000, 2005-11-15 Ed. 1**
  Security management systems for the supply chain

- **ISO/PAS 28003, 2006-10-01 Ed. 1**
  Security management systems for the supply chain—
  Requirements for bodies providing audit and certification of supply chain security management systems

- **ISO/IEC 28004, 2007-10-15 Ed. 1**
  Security management systems for the supply chain – Guidelines for the implementation of ISO 28000

  Security management systems for the supply chain — Best practices for implementing supply chain security, assessments and plans — Requirements and guidance
1+2. Information and Supply Security

- North American Security Products Organization (NASPO)
  - American National Standards Institute (ANSI) accredited Standards Developer


- US National Security Assurance Standard, see www.naspo.info

- Impacts both information and supply security management systems

- ANSI/NASPO proposal for an ISO Fraud and Countermeasures Technical Committee (TC) was approved Jan ’09 creating TC 247

See www.naspo.info
3. Authentication

- Developed arena
  - Overt methods: optically variable devices (color shift, holograms), intaglio, labels, markings, etc
  - Covert methods: taggants, invisible markings, DNA, micro-tags, nanotechnology, and forensic analysis
- Multi-layer approach has become the default
  - Keep changing out elements as counterfeiters catch up
- Past: internally motivated implementation
- Future: legal or commercial requirement for market access
3. Authentication: New Dimension

- Additional technique being adopted globally, termed
  - Mass Serialization (MS)
  - Product Control and Authentication (PCA)
  - Digital Authentication (DA) (compared to Sensory)

- Securely connect products, people, documents, or processes to the Internet to support authentication
3. Authentication: Evolving Numbering Approaches

- Simple numbers: 12345...12346...12347......

- Data embedded numbers: 080402 624 42134 123Q2N627

- Secure, unique codes 3j214i038og3
  - Securely generated codes and secure platforms
  - Codes link to authentic record containing original data
    - Data parameters and access controlled by client
3. Authentication: Secure, Unique Codes

- Can be added to existing stream of identifiers or be used as a substitute (serial number as secure code)
- Codes added to supply—product, package, case, document, etc
- Authentication available at any point in lifecycle—from supply through customs, distribution, retail, and final owner or consumer
- Authentication possible through the following:
  - Computer and Internet browser
  - Mobile phone: SMS
  - Mobile Internet—character entry or 2D bar code
- Codes may be overt, covert, both, and/or associated
## Use and Source of Secure Codes and Platforms

- **Nokia**  Proprietary system  Batteries
- **GSK**  Proprietary system  Pharmaceuticals
- **Nike Golf**  TUV Rheinland  Golf clubs
- **Cardinal Health**  SupplyScape  Medical devices
- **Lexcom**  TUV Rheinland  Automotive parts
- **Driscoll’s**  YottaMark  Agriculture
- **Teccom**  Vesdo  Automotive parts
- **Saudi Arabia**  Multiple systems  Import certificates
- **US Dept. of Defense**  Multiple systems  General supply
- **Others:** electronics, medical devices, consumer electronics, luxury goods, consumer goods, healthcare, automotive, food and agriculture
What Issues Are Being Addressed By Use?

- Supply security
- Brand Integrity
- Anti-counterfeit
  - Unintended counterfeit purchases*
    - Faster discovery and response time
  - Intended counterfeit purchases*
    - Legal evidence
- Support investigations, interdictions, and seizures
- Support trade intelligence

What Issues Are Being Addressed By Use?

- Answer questions
  - Is it ours?
  - What is it supposed to be?
  - Is it where it is expected to be?
  - Authenticated? When and where?

- Leads to track, trace, secure streams, and chains of custody
  - Add timing, process, and association rules
Additional Advantages

• Augments existing approaches easily
• Implementation is simpler than most alternatives
• Scalable
• Adaptable
• Resource and strategy coordination
  • Brand Risk Management team
  • Enterprise
  • Suppliers
  • Customs
  • Resources and vendors
  • Distributors
  • Retailers
Additional Advantages

- Continuity over time

**Illustrative example**

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2.5</th>
<th>Year 4.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optically Variable Device</td>
<td>Hologram A</td>
<td>Hologram B</td>
<td>Color shift</td>
</tr>
<tr>
<td>Covert marking</td>
<td>UV</td>
<td>Invisible bar code</td>
<td>Micro/nano markers</td>
</tr>
<tr>
<td>Covert forensic</td>
<td>Specialty ink A</td>
<td>Specialty ink B</td>
<td>DNA</td>
</tr>
<tr>
<td>Unique, secure codes</td>
<td>Codes</td>
<td>Codes</td>
<td>Codes</td>
</tr>
</tbody>
</table>

**Authentication platform**

Client-controlled, multi-party access
- Suppliers
- Distributors
- Retailers
- Customs
- Investigations
- Consumers
Mass Serialization Regulations and Standards

- US Food & Drug Administration (FDA): Notice of Proposed Rule Making (NPRM) affecting medical devices (Nov ’06)
- US FDA pharmaceutical maker user fees NPRM (May ’07)
- US Department of Defense Unique Identification Policy
- ANSI proposal for an ISO Fraud and Countermeasures Technical Committee (TC) was approved Jan ’09 creating TC 247 with NASPO as Secretariat
- ISO PC 246: “Performance requirements for purpose-built anti-counterfeiting tools”
Mass Serialization Regulations and Standards

• Semiconductor Equipment Materials International (SEMI) and Semiconductor Industry Association (SIA)
  • Working jointly and in tandem on authentication standards
  • SEMI US and SEMI Japan Traceability Committees have each formed an Anti-Counterfeit Task Force (ACTF)
  • European SIA has an established ACTF
  • SEMI US: Four proposed standards through initial ballot
    4486  System architecture (re-numbered SEMI T20 at ballot)
    4487  Labeling (Proposed as SEMI T20.1--in review Q109)
    4488  Communications
    4489  Authentication Service Provider Qualifications
More on Mass Serialization’s Secure Codes

- Secure, unique alpha-numeric codes
  - Difficult, expensive, and time-consuming to crack code generation algorithm
- Secure platform to execute and manage authentication
  - Positively identify codes generated by system
  - Data parameters set by client, tailor to different groups
- Code generation models vary
  - Secure Hash Algorithm (SHA)
  - Proprietary
More on Mass Serialization’s Secure Codes

- Secure codes are carried by some means
  - Example: label, print, or marking

- Secure codes are formatted based on carrier
  - Overt: bar code, 2D bar code, print, label, mark
  - Covert: invisible bar codes; DNA, micro, and nano markers
Product Control and Authentication (PCA)

- Codes are incorporated into production
  - Printing, labels, engraving, marking, tags, etc.
  - Multiple formats:
    - Linear bar codes, 2D bar codes, RFID, etc.
Product Control and Authentication (PCA)

- Secure codes are confirmed by
  - Computer Web browser
  - Mobile text message—Simple Messaging System (SMS)
  - Smart phone Web browser
  - In-line and in-process systems
  - Proprietary readers
  - Verification message and content controlled by clients
  - Multiple language support
PCA Enables Secure Trade Streams

- Tailored workspace
  - Specify processes, transaction and check points, data, and format
  - Programmable process, timing, and channel parameters
  - Hierarchical, associated, or chained codes
  - Enable or disable authentication to match needs

- System access and use records provide basic tracking and tracing
  - Confirm expected events occurred
  - Flag unexpected events for investigation

- Tailored reporting: generic, pre-defined, or user-defined
About TUV Rheinland

• 137 years of objective independence
• Global Assurance Services innovator
• Leading test, certification, and audit provider
• ‘Sicherheit’ means safety and security
• 13,000 employees, 400 offices, 61 countries
• More than U $1.1 Billion revenue
• http://www.tuv.com/de/en/about_us.html
Trade Cycle Framework...

**Supply Network**
- Consumer Electronics
- Home & Appliance
- Tools, Lawn, Garden
- Audio/Video/Multimedia
- Fitness, Sports, Health
- Entertainment & Amusement
- Medical Devices
- Scientific Instrumentation
- Information Technology
- Communication Technology
- Wireless Technology
- Laser & Optics Technology
- Software
- Office Equipment
- Semiconductor
- Process Control
- Machinery
- Power Distribution

**Demand Network**
- Retail Sourcing
- Distribution Import/Export
- Procurement Direct Market/Sale
- Exchanges Hubs & Auctions
- OEM/ODM = Original…
- OEM…Equipment Manufacturer
- ODM…Design Manufacturer

**Owners Network**
- Consumers
- Industry
- Insurance
- Business
- Government
- Education
- Retail
- Healthcare
- Small Business
- Transport
- Institutions
...enables Lifecycle View
Three Market Factors

- **Performance**
  Distinguishing benefit: product, process, service, and/or characteristic

- **Commercial Access**
  Additional market-driven, demand channel, or customer requirements

- **Legal Access**
  Public policy requirements and means of implementation enabling legally sanctioned products, processes, or services onto a market
Multidimensional Strategy Required

- Risk Policy & Mitigation
- Authentication
- Supply Security and Control
- Track and Trace
- Business Intelligence
- Investigations
- Technology and Carrier Strategy
- Information Security Management
TUV Rheinland Group Standing: Security Assurance

- Charter Member, North American Security Products Org. (NASPO)
  - NASPO Class II certified
- Founding Member: International Authentication Association (IAA)
- Authorized US Department of Homeland Security (DHS) auditor for Customs-Trade Partnership Against Terrorism (C-TPAT) pilot
- Authorized EU Customs auditor (EC No. 648/2005)
- Certification body
TUV Rheinland Group Standing: Security Assurance

- Member, International Anti-Counterfeit Coalition (IACC)
- Member Semiconductor Equipment Materials International (SEMI)
  - Anti-Counterfeiting Task Force (ACTF)
- Member, Coalition Against Counterfeiting and Piracy (CACP)
  - Anti-counterfeiting and Piracy Summit sponsor
- Business Action to Stop Counterfeiting and Piracy (BASCAP) supplier
Information and Supply Security

- Complete supply network security assessments
- Information Security Management System audits: ISO/IEC 27001
- Supply Security System audits: ISO 28000
- US DHS C-TPAT audits
- EU Customs Code (EC No. 648/2005)
- US NASPO AS v3.0 expertise
Partner Services

- Investigations
  - Supply Security preparation
  - Field work and Customs relations
  - Background checks
- Internet Monitoring
- Secure Printing and Labels
- Optically Variable Devices and Secure Foils
- Micro, Nano, and DNA markings and markers
- Overt and covert solutions from Mutual Development Partners
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