

FORENSIC SECURITY INKS FOR TRACK AND TRACE

AUTHENTICATE SUPPLY CHAIN MANAGEMENT

END USER AUTHENTICATION



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UNIQUITY 2015

BACKGROUND

Mechanical Engineer

Printing Industry

Technology Transfer Group - Security printing

PhotoSecure

DNA Technologies

Art and Collectables

Every ink, digital ink

Bar codes Unique numbers

Track and Trace

Authenticate the object, mark with forensic mark

Auto ID the information daily

Give the waybill number to every person

Provide a cell phone Authentication

Forensic taggants

- ❑ Forensic - relating to the use of scientific knowledge or methods in solving crimes:
- ❑ relating to, used in, or suitable to a court of law.
- ❑ Society has used forensic elements in ways for 1000s of years.
- ❑ In printing : engraving, guilloche, micro, threads, color and shift, UV, IR, holograms, random pattern algorithms,
- ❑ scrambled indicia, molecules, DNA.

Forensic taggants Cont'd

- ❑ In many cases, counterfeiters learn the secret quite quickly.
- ❑ As the science gets better, the secret gets darker.
- ❑ Although that should be a good thing, it also makes the secret less important to the average purchaser and or the logistic chain.
- ❑ The problem is more severe than ever today – with one exception:

A new Paradigm ?

Of all of the forensic elements that have been used to date, the only one that has universal acceptance is DNA.

World wide acceptance and understanding of the second part of the definition – “relating to use in court” is de facto knowledge in the minds of the criminal, the casual handler of the item , and, the **End User**.

A new Paradigm ?

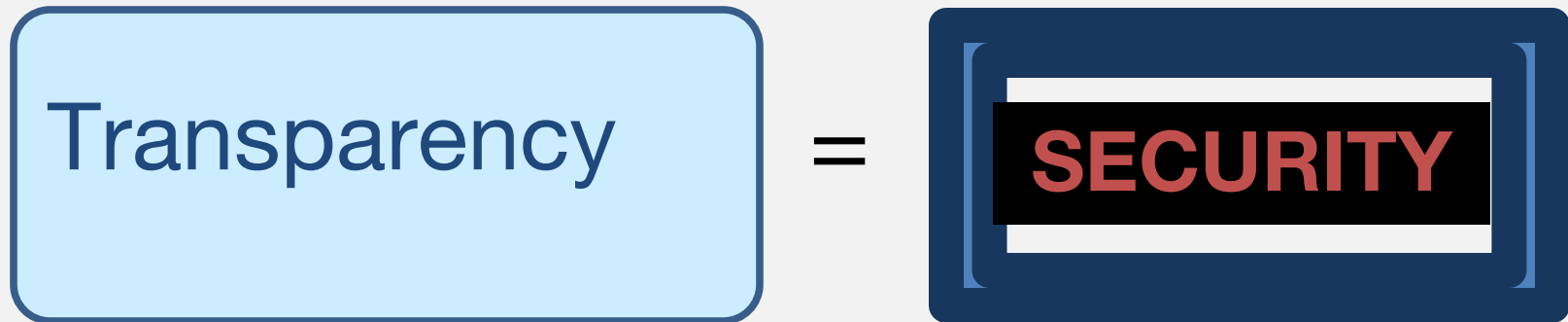
In a parallel development bar coding has evolved into extremely reliable fast and inexpensive technology –

Today Pharma is forced to apply the every unit item - ePedigree laws.

So, adding a forensic taggant to a Unique Identifier and collecting information every day on the item gives us the possibility of:

A new Paradigm ?

- A waybill number for each item in the shipment
- Digitally printed bar code
- Visible and invisible with forensic taggant
- Initiated at the design stage of the label and package
- Automatic data collection tuned to invisible ink
- Integrated to the enterprise production shipping and financial reports
- Waybill number publicized and available to anyone



Forensic Taggants

1

- ❑ Many 'Silver Bullets' have been developed for the Forensic (covert) element of a printed mark.
- ❑ The most successful are imbedded into the item or the label often in an ink.
- ❑ Holograms have been one of the most successful – IF they contain some special character for lab confirmation.
- ❑ Without that, a piece of foil with some impressions on it will get by – especially for a willing anxious purchaser.
- ❑ Recently holograms have very fine and effective “engravings” – 3D , color shift, and even DNA coatings.

Forensic Taggants

2

- ❑ Scrambled Indicia and Scrambled dot structures are very simple to create and effective covert methods – and do not need a lab. Do need a specific photographic device and access to memory system.
- ❑ The unique number married to the forensic mark and tracked throughout give the Transparency value to the combination.
- ❑ (See Systech brochure on this concept, Unisecure (I just learned this this week) is one of the “hidden in the dots”
- ❑ Unique numbers approach.

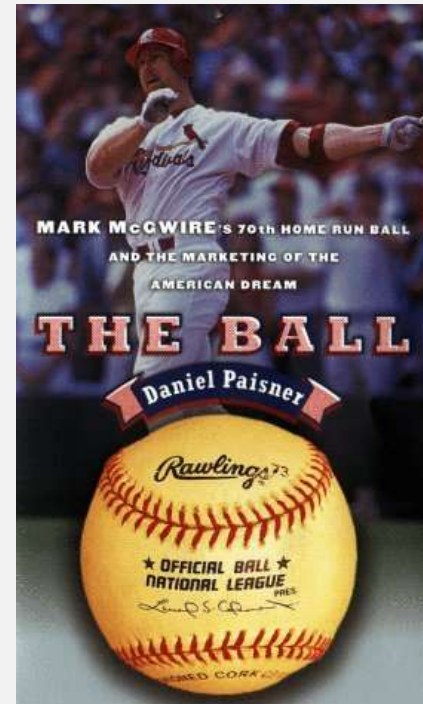
Forensic Taggants

3

- ❑ Molecular taggants such as DNA provide the most interesting Forensic taggant.
- ❑ Widespread understanding of DNA as a crime lab forensic element has made the Transparency equals Security idea work.
- ❑ Not transparency of the DNA code used for the purpose, but transparency of the fact that DNA is present and then the UIC and the Track and Trace system – given to the and user gives control over to the person or entity that keeps the data, and no one else.

The DNA Application

- The application of a DNA security mark has helped distinguish authorized and legitimate goods in the global marketplace and bring credence to manufacturers and distributors who seek this channel support.
- Patented in 1993 and used for many years now in Authentication of valuables



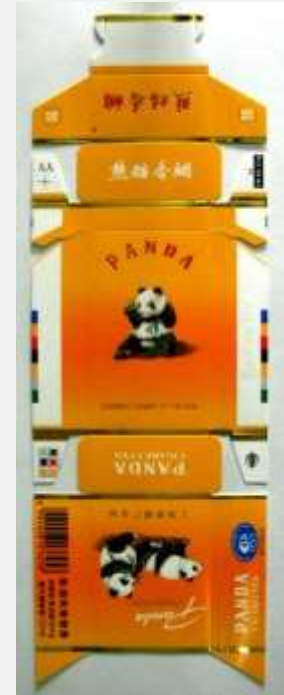
Unique Applications



Thomas Kinkadee marks all his limited edition prints with a DNA signature pen



Protection of the Official Merchandise from the Sydney 2000 Olympic Games



Panda Cigarette Pack, Shanghai Tobacco Group



Avery Dennison produces high security woven labels for the branded apparel industry

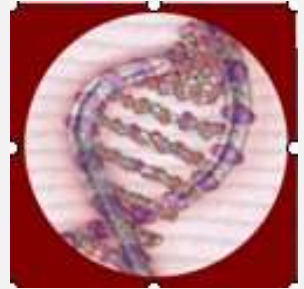


BRL Hardy's uses DNA from 100 year old grape vines to protect its high end wines

PSA DNA Hall of Fame Hockey Pucks



DNA



DNA is deoxyribonucleic acid, the building block of the gene chemistry of any living organism. The DNA of an individual is well known in the forensic field as “evidence of conviction” because of its uniqueness and is now accepted by the courts of justice worldwide as verified evidence of source. DNA has become synonymous with proof of authenticity and scientific accuracy and these powerful attributes make DNA a prime candidate for a unique security marker.

DNA

- The DNA mark is a high security anti-counterfeiting mark that cannot be reverse engineered or duplicated. It can be a covert or overt mark, detectable with specially calibrated readers for “in the field” verification.



Information Coding and Serialization



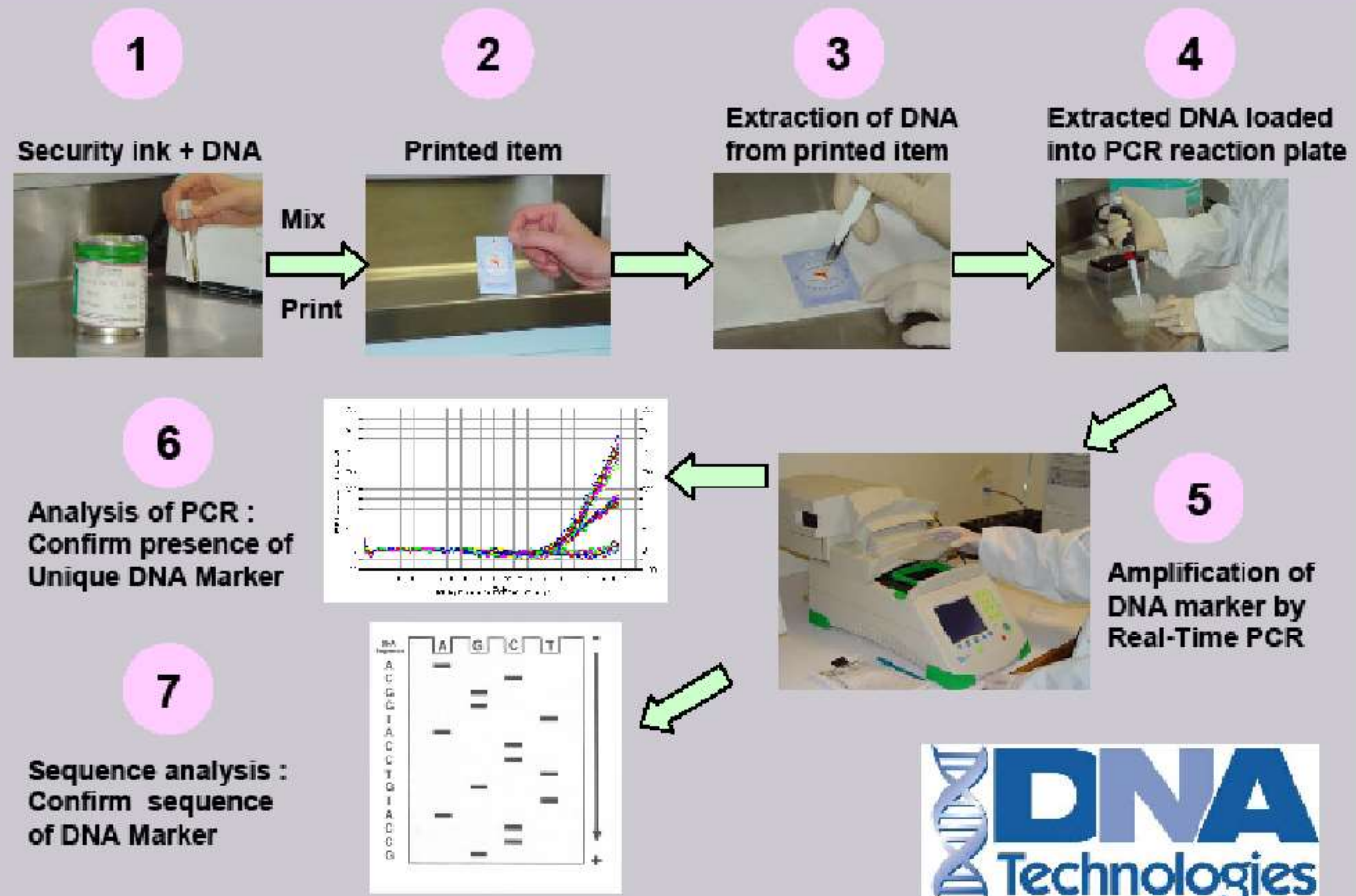
- Sophisticated software used to drive inkjet, laser, and other high-speed printing machines
- Variable data coding
- Serialization empowers Track & Trace capabilities



Drug bottle

DNA Application and Test

DNA Marker Authentication- Overview



Variable Date



- ❑ Variable data coding and marking for industrial packaging
- ❑ High speed & high resolution
- ❑ Hewlett-Packard print head designed specifically for small character and bar code printing
- ❑ Produces clear, readable bar codes required by package vision verification cameras



Identification



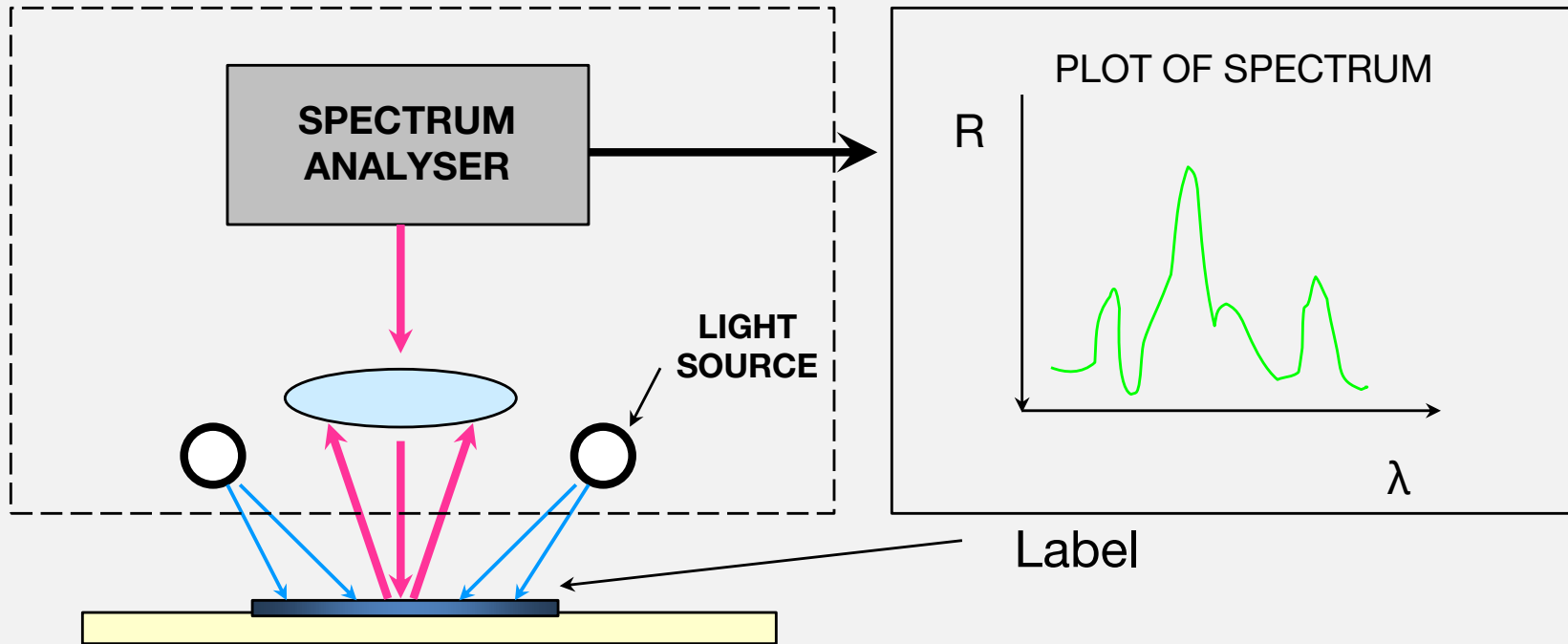
- Inspects characters and codes for quality, angle, size, and spacing
- Uses advanced image analysis and processing techniques to rapidly locate and read 2D codes marked onto plastic, metal, glass, and paper



Fixed, In-line reader

Hand held reader

IDEA OF SPECTRUM ANALYSIS



Step 1: Light source illuminates a label

Step 2: Optical system collects reflected light

Step 3: Spectrum analyzer measures energy of signal for different wavelengths

Step 4: Decode marks

Integrated Enterprise-Wide Approach

Internal departments



Dispersed corporate teams



External agencies



Digital Workflow and Real-time collaboration tools Print service providers
Automated, streamlined and tracked process reduces production complexities, redundancies and errors

Courtesy Design2Launch Kodak

Combined Technologies

Passports/Visas



Color Image

IR (Infrared) Printing
B900 Ink



UV (Ultraviolet)
Security feature

Coaxial Light
Security
Laminates

Driver's Licenses & ID Cards



Color Image



IR Printing

UV Security

Laminate



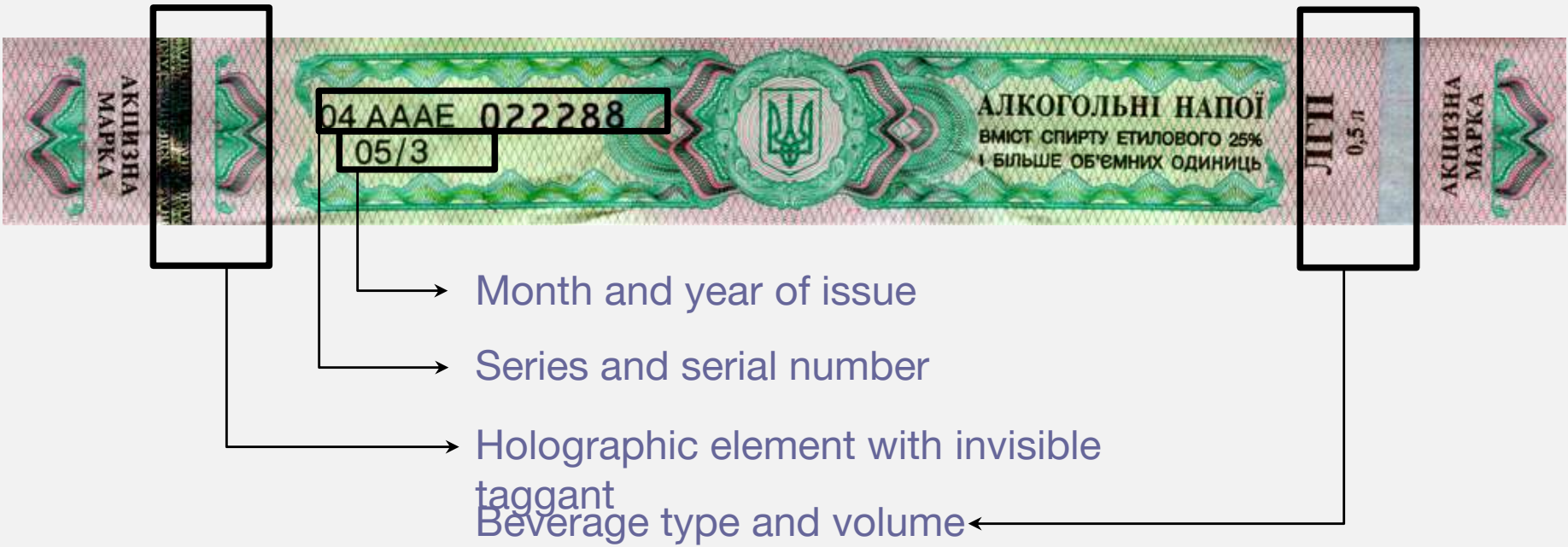
Combined Technologies

- The addition of covert security features to the overt security measures of a hologram or hot stamp foil, adds a layer of undetectable security that is extremely difficult to identify or replicate.



EXCISE STAMP STRUCTURE

HOW THE OVERT AND COVERT TECHNOLOGY WORK TOGETHER



Standard cell phone tracking



Instant brand verification
A simple three step process that takes less than three seconds.

Available for iOS and Android
Use your existing hardware, deploy to your agents' smartphone handsets.

The image shows a smartphone screen displaying the 'cryptoTRACE' app. The app has a header with the logo and a 'Choose a product to verify' prompt. Below this is a grid of product images with labels: 'U-NICA World Class', 'U-NICA Bottle Seal', 'U-NICA Box', 'U-NICA Car Spare Part', 'U-NICA Demo Box', 'U-NICA Face Cream', and 'AuD Demo Box'. The 'u-nica' logo is visible at the bottom of the screen.

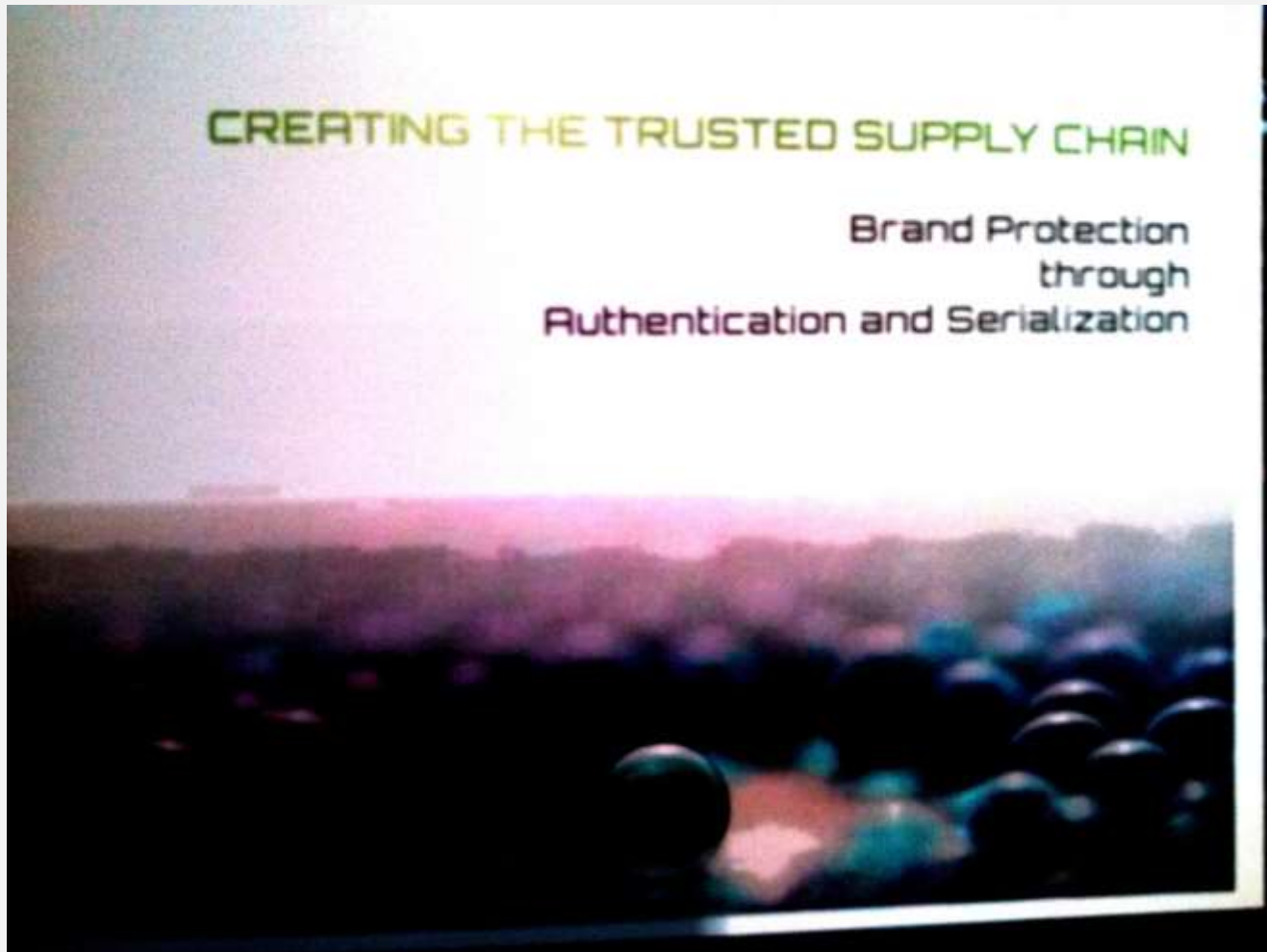


Full offline functionality
Verification takes place on an offline environment, no data connection required.

Simple to use, access from anywhere
Give the app to supply chain agents or field investigation agents for maximum coverage.

The image shows a smartphone screen with an AR overlay of a 3D product box. The box is labeled 'u-nica' and has some text on it. The app interface includes a close button (X), a refresh button, and a 'off' button with a blue arrow.

To my surprise – when I arrived here,



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