naphsis

IDENTITY & SECURITY CONFERENCE

December 1-2 Gaylord National Harbor

Innovation for Preventing Misuse of Vital Records Documents

Elaine Wooton - Technical Advisor / Forensic Document Examiner

SCI-FI LIKES PKI

INNOVATION FOR PREVENTING MISUSE OF VITAL RECORDS DOCUMENTS

Elaine Wooton, MFS, D-ABFDE

FUTURE OF IDENTITY

Who

Former INS/ICE “Crime Lab”

Expertise

- ∞ evaluating counterfeit identity documents
- ∞ better design for security documents
- ∞ “transition” between physical & digital IDs
- ∞ transparency within the identity ecosystem

Why

- *Changes in the identity ecosystem seem random and many do not primarily serve the needs of individuals*

- *We can influence the future by just thinking about it – and talking about it!*

- *Utah and “SEDI”*

Utah and “SEDI”

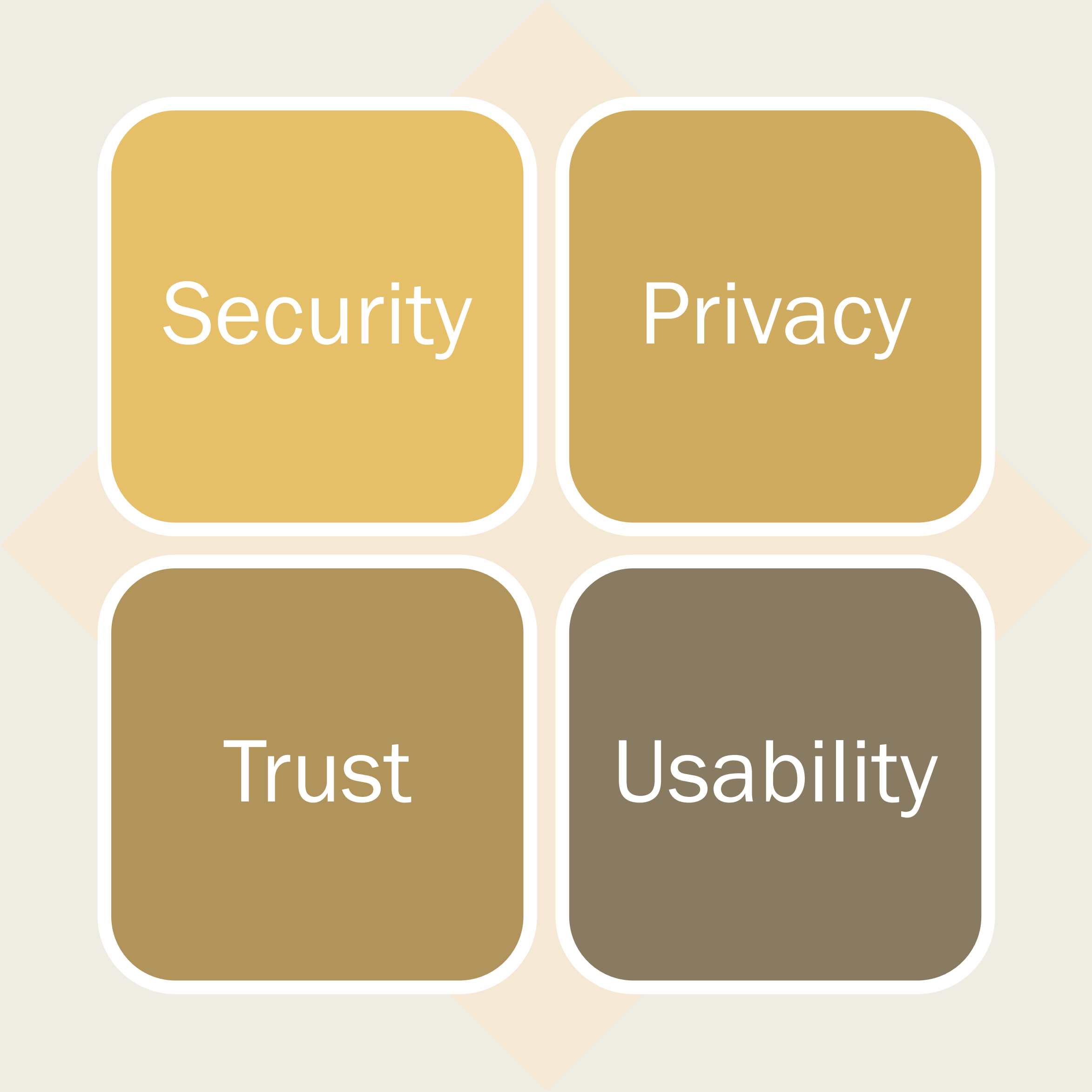
The **State-Endorsed Digital Identity (SEDI)** initiative in Utah aims to create a **decentralized digital identity framework** that prioritizes individual control and privacy.

Key aspects include:

Individual Autonomy: SEDI emphasizes that identity is inherently decentralized and belongs to the individual, not the government.

Governance and Privacy: The initiative seeks to restore trust in digital identity by ensuring that individuals fully control their digital identifiers and that the state endorses and protects their identity.

CORE CHALLENGES OF IDENTITY MANAGEMENT



Security

Privacy

Trust

Usability

Core problems

"How do I prove who I am?“

Identity management revolves around a few hard questions:

- Who are you really?
- How can you prove it safely and conveniently?
- Who (or what) do you trust to say that’s true?

Who coordinates that all the entities involved with identity management are well-informed and perform effectively?

Vital records ecosystem

USERS: Everyone / Potential fraud victims

ISSUANCE: State registrars / Document Vendors

ENFORCEMENT: Law enforcement / Identity thieves & fraudsters

ACCOUNTABLE ENTITIES: States – Service Vendors

RESOURCES: Machine authentication system companies - Internet identity verification companies - Forensic personnel

Lessons from Sci-Fi: Human Identity Verification

Philip K. Dick, *Flow My Tears, The Policeman Said* (1974)

Scene: The main character, Jason Taverner, discovers one morning that all his identification has been wiped out—no record of him exists, nobody recognizes him, his fame is gone. Identity is erased in bureaucratic / technological systems.

Lessons from Sci-Fi: Human Identity Verification

Philip K. Dick, *Flow My Tears, The Policeman Said* (1974)

… the protagonist Jason Taverner wakes up one day to discover that *all his identification cards are missing*; checkpoints stop people without valid ID; if you can't prove who you are (via the documents that are normally required), you're in serious trouble.

**** Implications ****

Human Identity Verification

Biometric identity becomes foundational: face, iris, retina, fingerprints, possibly gait, voice, and even implants that record or generate memory. The idea is that who you *are* biologically or via augmentation becomes the credential.

Memory or data implants: verifying someone via their personal history, memories, or brain data. If that can be edited or stolen, then verification includes checking integrity, versioning, etc.

Continuous / passive verification: instead of "showing your ID card," the environment (smart devices, sensors) continuously recognizes or verifies you (e.g. walking past a gate, you're face-recognized). Physical documents become less central.

Corporations / centralized entities controlling verification: often these systems are controlled by big institutions or megacorps (or governments), so having access to verification is as much about having the right data/permissions + being registered properly.

Privacy/security trade-offs are a big tension: how to prevent identity theft, how to protect biometric templates; how to avoid misuse; who holds the verification power.

Lessons from Sci-Fi: Product Verification

1.Permanence by Karl Schroeder (2002) “Every object carries its own history, its own provenance, encoded in **nanites** that communicate with the world around them. To buy something, you don’t just check its price - you verify its entire lineage.” *Paraphrased*, but the whole book’s premise is that nano-tags on all objects record ownership, usage rights, and authenticity, making counterfeit or stolen goods easily detectable.

2.The Diamond Age by Neal Stephenson (1995) “**Smart matter** could report on its own condition and ownership, instantly revealing whether an object was genuine or forged.” The idea that smart materials embedded in products constantly report and verify themselves.

3."Supply Chain of the Future" (Futurism article, 2023) “Using **blockchain-backed digital twins and embedded sensors**, companies will verify each product’s authenticity and status throughout its lifecycle, preventing fraud and counterfeit.” This is nonfiction, but it’s a concrete near-future vision for product verification.

4."Nano-Tagging for Object Identity" (Science Advances, 2024) “Tiny **nanobots** embedded within manufactured goods will broadcast **unique encrypted signatures**, enabling instant verification by consumer devices and regulatory checkpoints.” Again, a current scientific forecast on the path to future product ID.

5."Black Mirror: Metalhead" (TV episode, 2017)

- While not about product verification per se, the technology in the episode implies that items or even living things can be tracked and verified remotely by machines with their **unique digital signatures**.
- Implies a future where everything is traceable and verifiable on the fly.

Product Verification

Nano-tagging or smart materials embedded in products that verify their authenticity, ownership, and history.

Blockchain-backed provenance records—immutable digital histories linked to physical objects.

Encrypted digital signatures broadcast by products or containers.

Real-time verification via devices (phones, scanners, checkpoints).

Integrated product identity with personal identity — e.g., when you buy something, your implant or ID verifies you and links to ownership.

LESSONS FROM SCI-FI

Sci-Fi likes PKI

Sci-Fi likes retina scans

Sci-Fi likes cloning

Sci-Fi likes life extension – moving our brains/consciousness to new hosts

LESSONS FROM SCI-FI

** Sci-Fi likes PKI **

Sci-Fi likes retina scans

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Sci-Fi likes life extension – moving our brains/consciousness to new hosts

Over the years, birth records (&marriage/death) evolved from entries in a family bible to simple documents and, later, to high security documents with complex printing and security features.

The quality of the more recent documents served a specific purpose – the sophistication of the documents served to bind the document data to the issuing authority.

Over time, the degree to which counterfeiters deceptively duplicate security printing and security features means that, based solely on those features, the documents appear to be bound to their issuing authority.

Since the document itself is no longer sufficient to ensure issuing states hold the corresponding data, it is critical to include a feature that definitively binds the document data to the issuer.

Having a digitally signed element that is signed by the issuer's private encryption key serves that purpose.   Having a digitally signed PDF also serves that purpose.

1. Colonial Era – mid-1800s

No standardized “birth certificates” / Births recorded informally by churches, midwives, families, or in family Bibles / Clergy or town clerks might attest to entries, but there was no official certificate or security paper

2. Late 1800s – Early State Registration

Industrialization and public health efforts pushed states to begin vital records systems / Cities often implemented registration before states (e.g., Boston, NYC) / Paper forms varied widely by jurisdiction / Birth attendants (doctors, midwives) were required to file notices / Certificates were simple text forms with signatures, no standard seal

3. 1900–1930: National Standardization Efforts

Key milestone: *U.S. Census Bureau creates the* ***Model Birth Certificate (1900)***

States begin adopting standardized formats / Centralized state registrars emerge / Certification begins to include embossed seals and official registrar signatures

4. 1933–1946: The Vital Records “Uniformity Era”

Drivers: *Social Security Act (1935) and WWII identity requirements*

Widespread adoption of **standard forms** defined in federal “Model State Vital Statistics Act” / Introduction of numbered **certified copies** (not the original record) / County and state seals become mandatory / Only designated registrars could issue authenticated copies / Record storage moves from local books to state archives.

5. 1950s–1980s: Security Paper and Anti-Forgery Measures

Why: *Increase in fraud tied to benefits, passports, mobility.*

Specialized **security paper** / Watermarks and microprint / Raised seals / Typed or machine-printed data / States maintain original, issue certified copies upon request

6. 1990s–2000s: Modernization and Identity Assurance

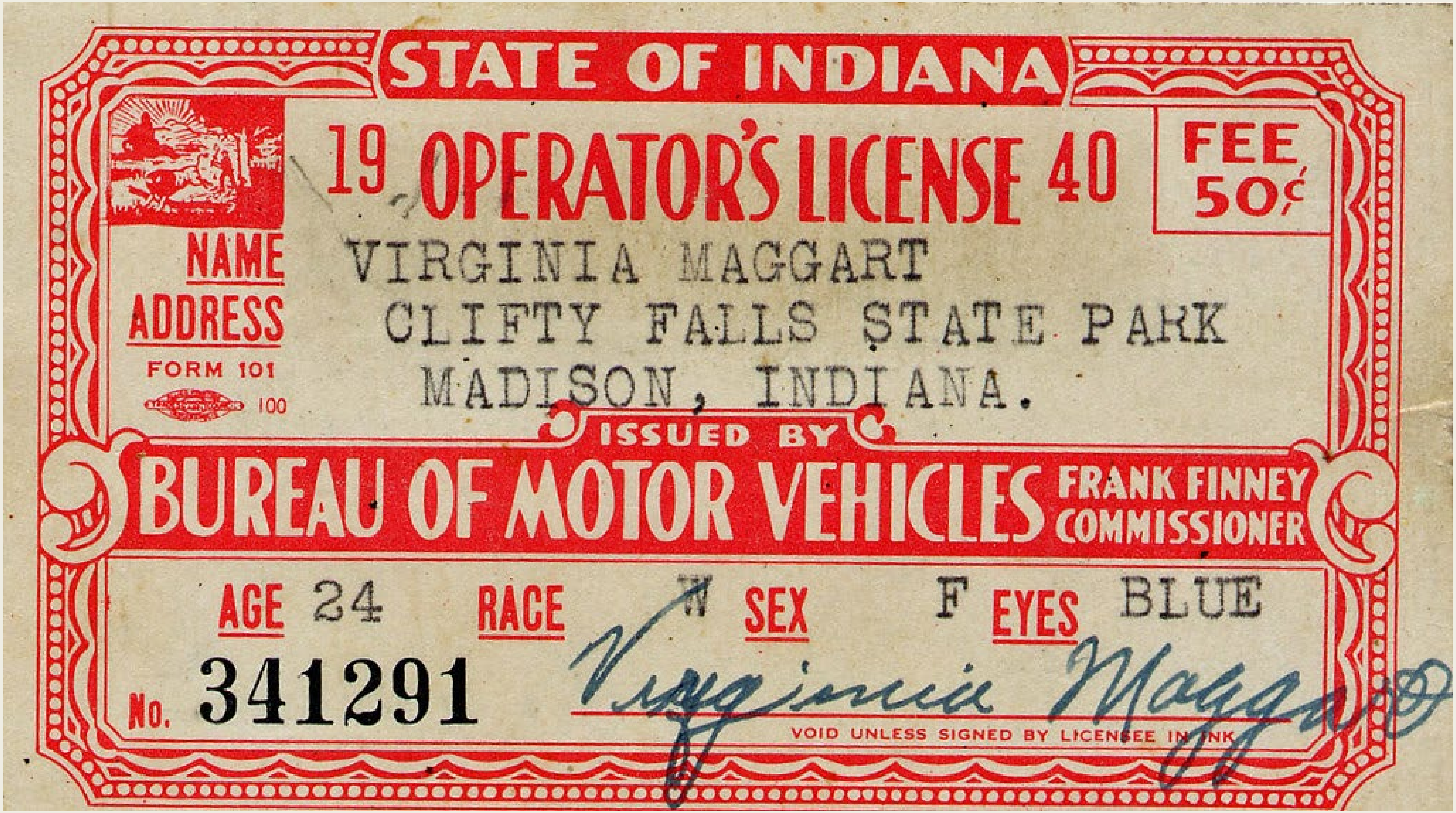
Catalysts: *passport security tightening, identity theft, REAL ID Act (2005).*

Laser-printed data / Barcodes or tracking numbers / Anti-copy backgrounds

7. 2010s–Present: Digital Verification Era

Electronic birth registration at hospitals / Encrypted digital record storage / Remote identity-proofed certificate requests /

Some jurisdictions piloting **digital birth certificate credentials**



STATE OF INDIANA

19 OPERATOR'S LICENSE 40

FEE 50¢

NAME VIRGINIA MAGGART

ADDRESS CLIFTY FALLS STATE PARK
MADISON, INDIANA.

FORM 101

100

ISSUED BY

BUREAU OF MOTOR VEHICLES

FRANK FINNEY
COMMISSIONER

AGE 24 RACE W SEX F EYES BLUE

No. 341291

Virginia Maggart

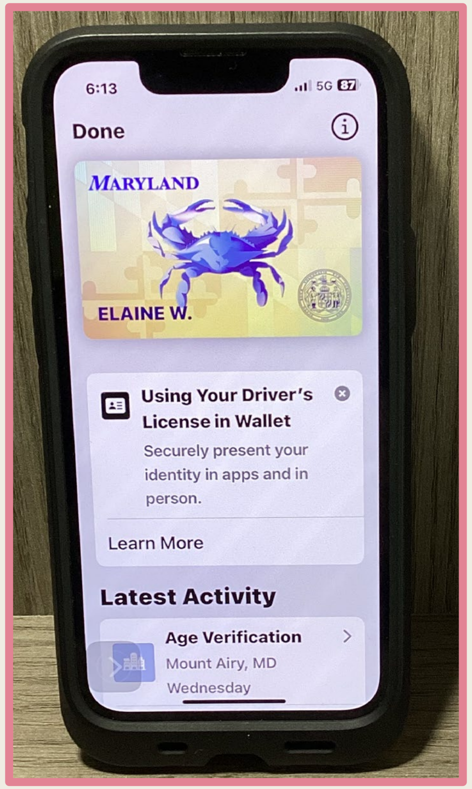
VOID UNLESS SIGNED BY LICENSEE IN INK

By Frank Finney - https://live.staticflickr.com/2174/2275645618_b16765f5d6_b.jpg, Public Domain,
https://commons.wikimedia.org/w/index.php?curid=149839445

ADVANCEMENTS

Recent

- Mobile DL
- Digital ID – for individuals
- [Overlap between mobile and physical]



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Done

MARYLAND

ELAINE W.

Using Your Driver's License in Wallet

Securely present your identity in apps and in person.

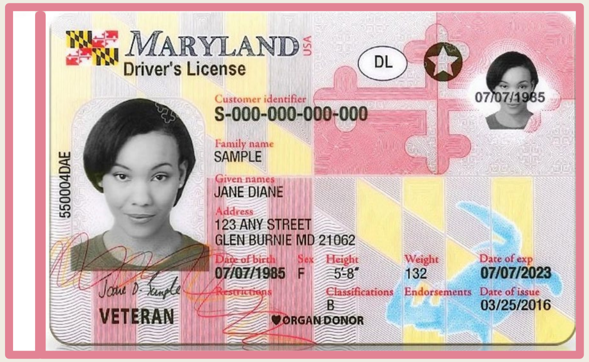
Learn More

Latest Activity

Age Verification

Mount Airy, MD

Wednesday



MARYLAND USA

Driver's License

DL

07/07/1985

Customer identifier
S-000-000-000-000

Family name
SAMPLE

Given names
JANE DIANE

Address
123 ANY STREET
GLEN BURNIE MD 21062

Date of birth 07/07/1985 Sex F Height 5'-8" Weight 132 Date of exp 07/07/2023

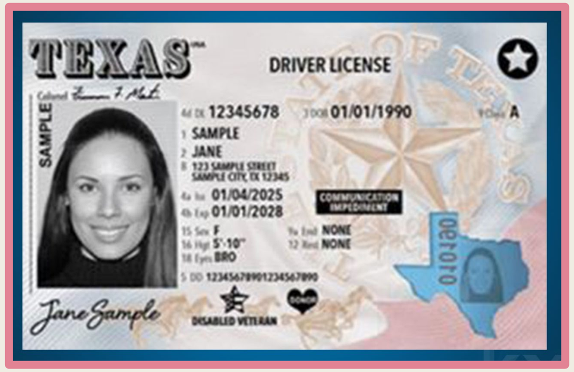
Restrictions Classifications B Endorsements Date of issue 03/25/2016

550004DAE

Jane D. Sample

VETERAN

ORGAN DONOR



TEXAS USA

DRIVER LICENSE

SAMPLE

4d DL 12345678

3 DOB 01/01/1990

9 Class A

1 SAMPLE

2 JANE

8 123 SAMPLE STREET
SAMPLE CITY, TX 12345

4a Iss 01/04/2025

4b Exp 01/01/2028

15 Sex F

16 Hgt 5'-10"

18 Eyes BRO

9a End NONE

12 Rest NONE

COMMUNICATION IMPEDIMENT

5 DD 12345678901234567890

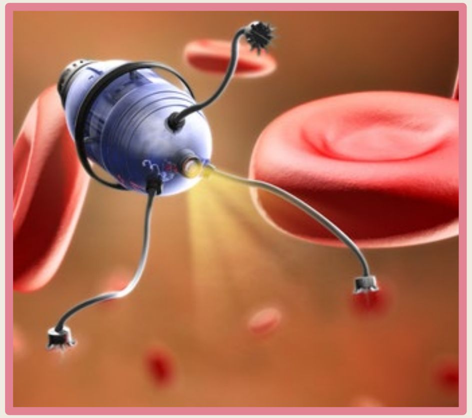
010190

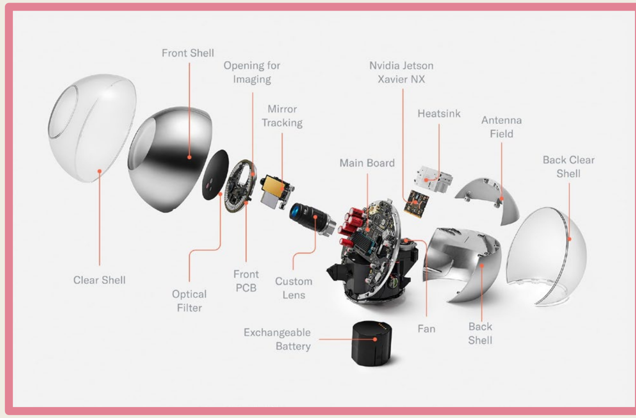
Jane Sample

DISABLED VETERAN

Emerging / Future

- Digital ID – for business/goods/services
- Orb
- Nanobots
- ???

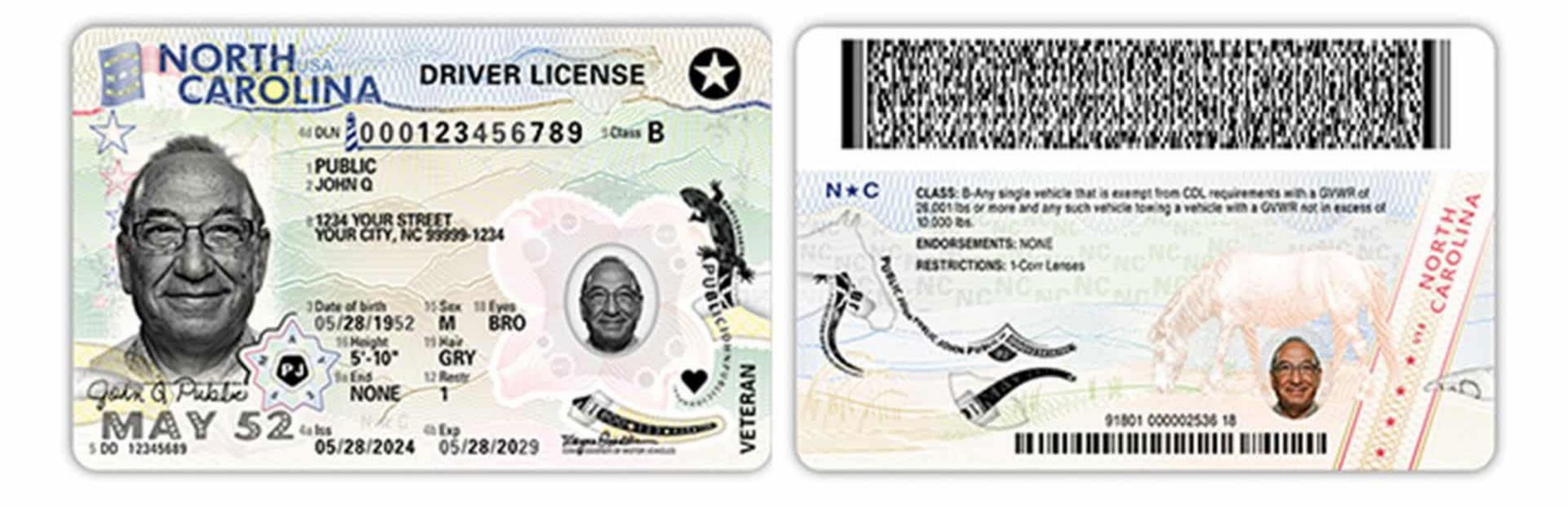




Overlap between mobile (digital) and physical IDs – it's ALL PKI!

→ Add cryptographic elements to physical documents ←

- Digitally signed hash of document info added to barcode
- Verifiable Credential Barcode
- Barcode with Face Vector



NORTH CAROLINA USA DRIVER LICENSE

4d DLN 000123456789 5 Class B

1 PUBLIC
2 JOHN Q

8 1234 YOUR STREET
YOUR CITY, NC 99999-1234

3 Date of birth 05/28/1952 15 Sex M 18 Eyes BRO
16 Height 5'-10" 19 Hair GRY
9a End NONE 12 Restr 1

MAY 52
5 DD 12345689
4a Iss 05/28/2024 4b Exp 05/28/2029

VETERAN

N★C

CLASS: B-Any single vehicle that is exempt from CDL requirements with a GVWR of 26,001 lbs or more and any such vehicle towing a vehicle with a GVWR not in excess of 10,000 lbs.

ENDORSEMENTS: NONE

RESTRICTIONS: 1-Corr Lenses

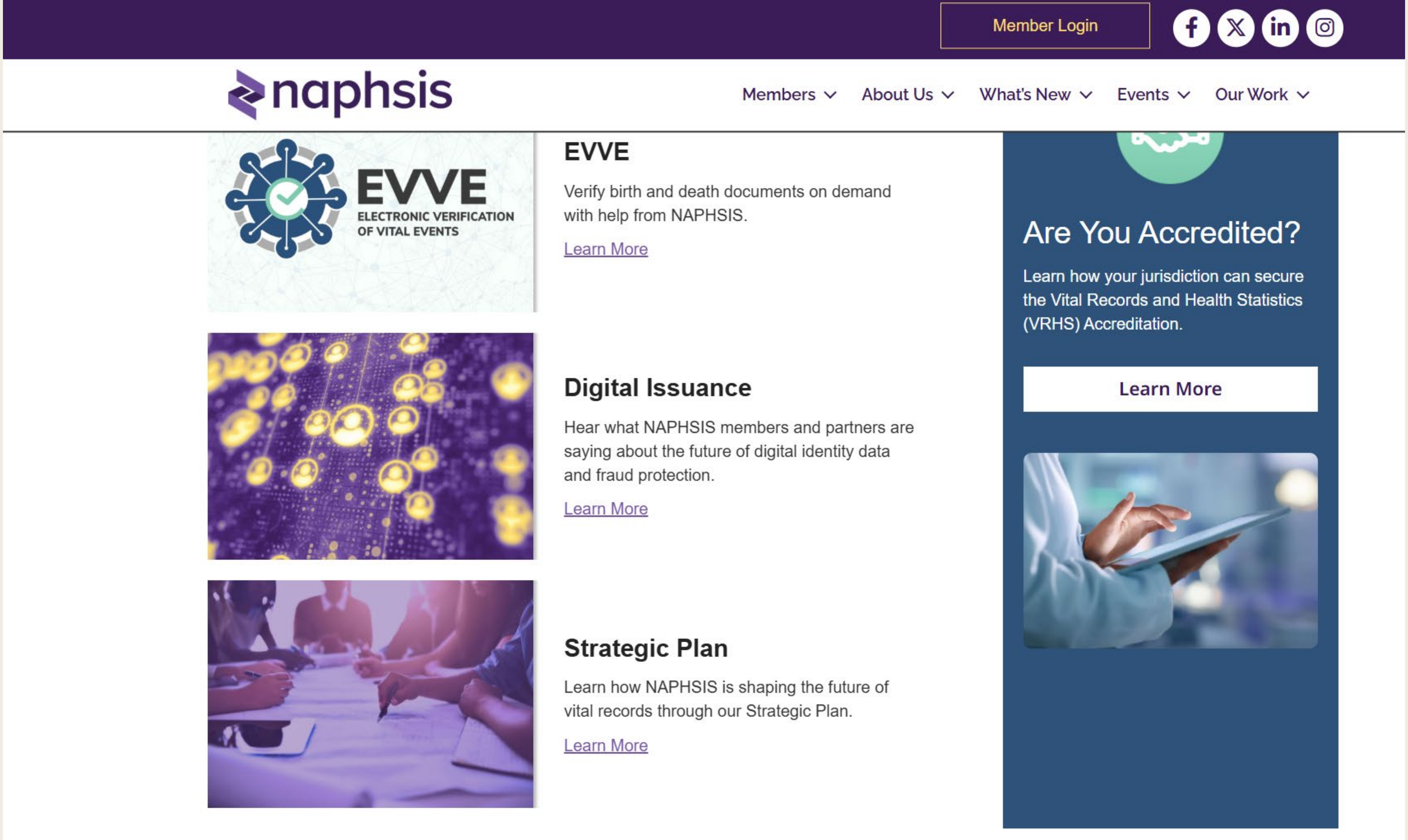
NORTH CAROLINA

91801 000002536 18

Future of Identity

Twenty years from now, birth certificates will likely be digital, biometric-linked, self-updating documents secured by cryptography, accessible via mobile or cloud interfaces, and globally verifiable.

Paper certificates may become largely ceremonial or backup artifacts, with the primary authority residing in secure, interoperable digital records.



EVVE

Verify birth and death documents on demand with help from NAPHSIS.

Learn More

Digital Issuance

Hear what NAPHSIS members and partners are saying about the future of digital identity data and fraud protection.

Learn More

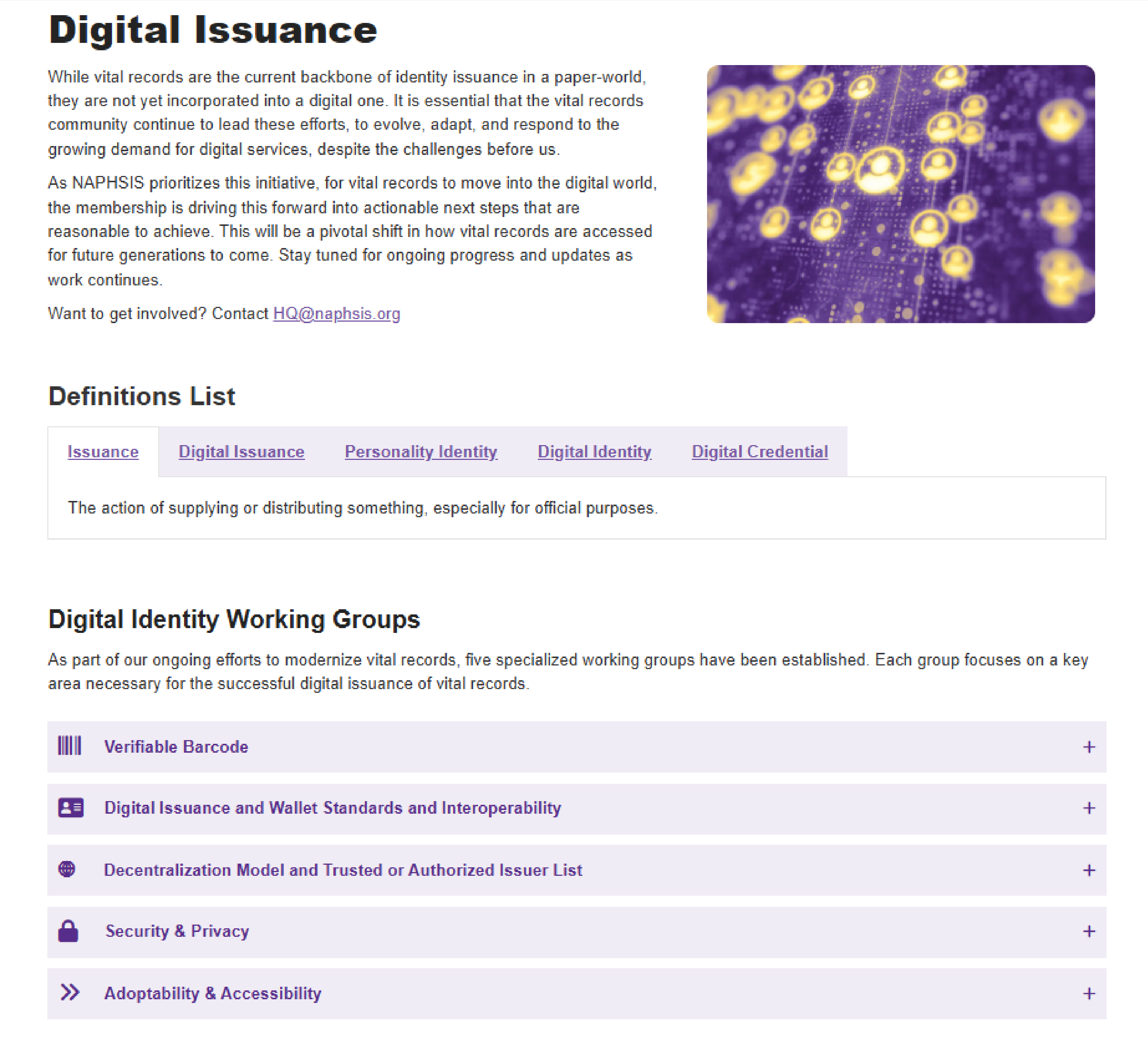
Strategic Plan

Learn how NAPHSIS is shaping the future of vital records through our Strategic Plan.

Learn More

Are You Accredited?

Learn how your jurisdiction can secure the Vital Records and Health Statistics (VRHS) Accreditation.



Digital Issuance

While vital records are the current backbone of identity issuance in a paper-world, they are not yet incorporated into a digital one. It is essential that the vital records community continue to lead these efforts, to evolve, adapt, and respond to the growing demand for digital services, despite the challenges before us.

As NAPHSIS prioritizes this initiative, for vital records to move into the digital world, the membership is driving this forward into actionable next steps that are reasonable to achieve. This will be a pivotal shift in how vital records are accessed for future generations to come. Stay tuned for ongoing progress and updates as work continues.

Want to get involved? Contact HQ@naphsis.org

Definitions List

Issuance | Digital Issuance | Personality Identity | Digital Identity | Digital Credential

The action of supplying or distributing something, especially for official purposes.

Digital Identity Working Groups

As part of our ongoing efforts to modernize vital records, five specialized working groups have been established. Each group focuses on a key area necessary for the successful digital issuance of vital records.

- Verifiable Barcode +
- Digital Issuance and Wallet Standards and Interoperability +
- Decentralization Model and Trusted or Authorized Issuer List +
- Security & Privacy +
- Adoptability & Accessibility +

AI disclosure

Some of the content in this presentation was gathered using ChatGPT. References to specific texts may or may not be accurate. The em dashes have been removed.

FUTURE OF IDENTITY