On The Future of Identity?

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IBIA Cofounder & Director Emeritus

Presented At:

From Biometrics To Augmented Human Recognition

Rome, May 10, 2012

My Past

1994

VISIONICS
DBI Digital Biometrics, Inc.

VISIONICS CORPORATION

identix

identix

ViiSAGE
+$100 M

L-1 IDENTITY SOLUTIONS™

2001

2002

2006

2011

VISIONICS CORPORATION

identix

L-1 IDENTITY SOLUTIONS™

SAFRAN
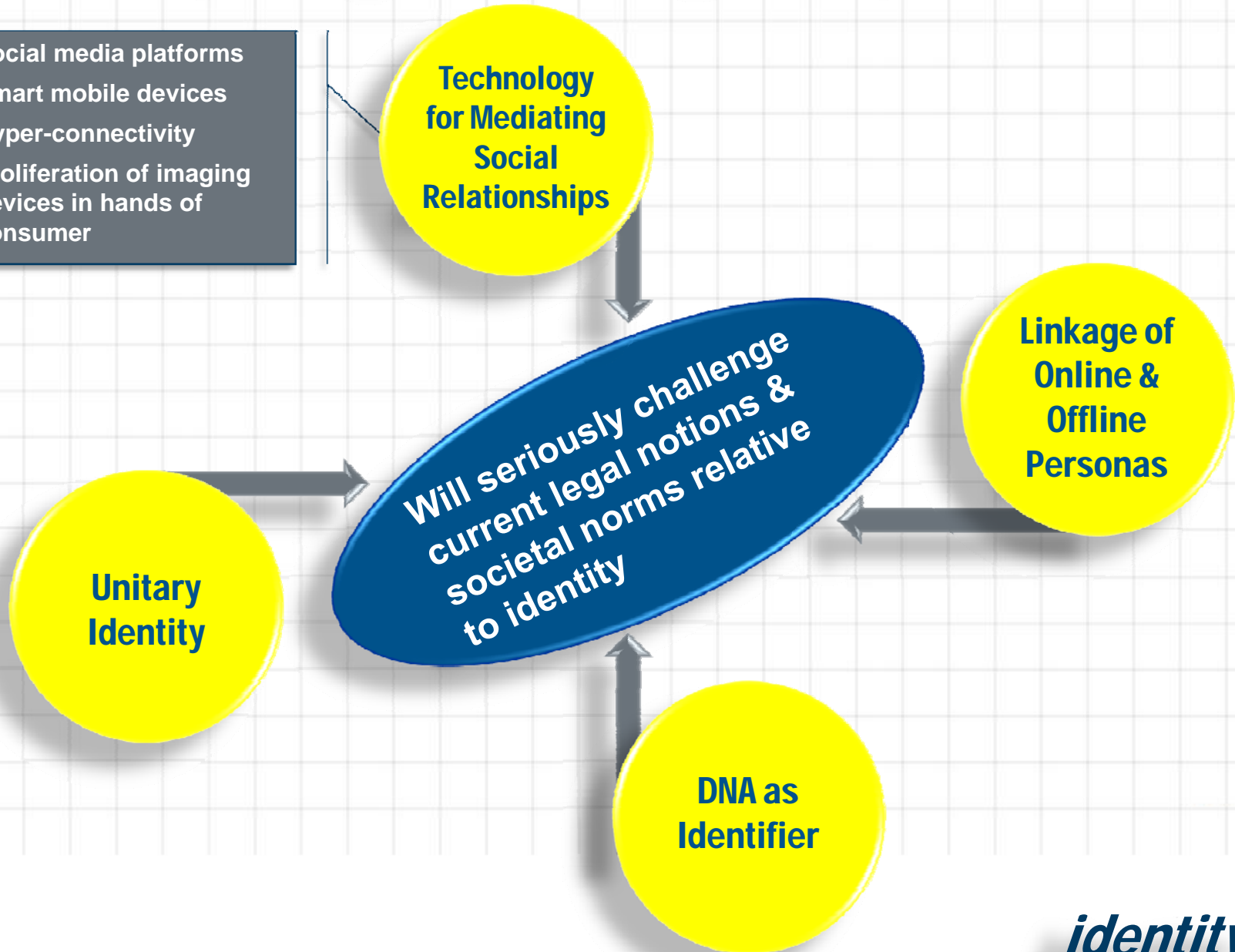
MorphoTrust USA

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Motivation: Convergence of Multiple Factors

- ✓ Social media platforms
- ✓ Smart mobile devices
- ✓ Hyper-connectivity
- ✓ Proliferation of imaging devices in hands of consumer

Technology for Mediating Social Relationships

Linkage of Online & Offline Personas

Unitary Identity

DNA as Identifier

Will seriously challenge current legal notions & societal norms relative to identity

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- **Unitary Identity**

- **Identity Surveillance**

- Identity Linkage (online, offline, social media personas)

- **Reputation Revisited**

- **A Legal Framework**

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Caveat

- **Presentation will NOT address cultural nor generational nuances in societal notions of identity**

- **Will attempt to deal with universalities albeit from a Western cultural point of view**

- **The heterogeneity that exists in reality will be dealt with elsewhere**

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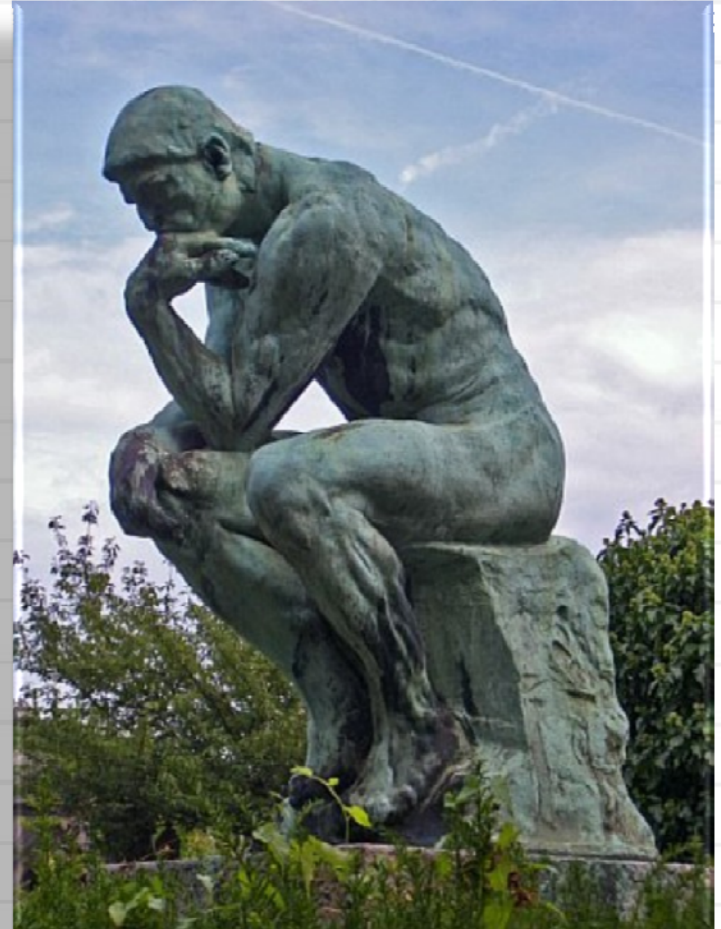
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Unitary Identity:

One Identity for One Individual for One Lifetime

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- **Idea that every person should be associated with a unique number throughout life is not new**

    – **Dates to more than 120 yrs before India's UID & Indonesia's NIK**

    – **Seriously proposed in 19th century & several times thereafter by advocates of social order**

    – **Subject of many novels way before Orwell (see below)**

- **Honorable Motivation?:**

    – *"Document origin & civil evolution of each person"*

    – *"Important means for safeguarding civil rights"*

    – *"It would deter people from committing crime, contribute to national harmony"*

    – **Economic benefits: permanent census & other book-keeping data**

HELLO
my barcode is

0 28019 65226 3

Made at BARCODEART.COM

"If we only had a way to associate people with a number uniquely & permanently we can hold them accountable for their actions"

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When a country, with any number of inhabitants, owns its National Book of Personality, then Man in that country will be known and valued as such; relationships will be easy and perfect; public security will be more assured; income will be more solidly warranted; justice will be more certain; the family will be guarded against dissolution and despoilment; in a word, man will be guaranteed in the exercise of his civil and political rights by the State at all moments and to a surprising degree of exactitude

--The Personal Number and the National Book of Personality by **Dr. Luis Reyna Almandos**

Dr. Almandos proposed the Personal Number & the National Book of Personality in Argentina in late 19th century.

Lobbied for adoption by all countries around the World

- Based on Vucetich's fingerprint methodology for indexing identity
- Introduced the Symbol Y for identity (Y15744839283934 = John Doe)
- Adopted in Argentina just before WW1 but found unconstitutional 9 months later

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Establishing Uniqueness

- **Cost & cheer effort required to pinpoint & maintain unitary identity never deterred advocates**
  - ROI was always calculated positive: reduce fraud, reduce crime, permanent census.
  - Program supposed to pay for itself

- **Deterrent was lack of viable technology**
  - The civil register – despite all bureaucratic processes of the state – could not guarantee uniqueness

- **Today, we are in a completely new era:**
  - What was impossible is finally technologically possible

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Identification Technologies

Unitary Identity requires scalable identification technologies for establishing uniqueness:

I. Anthropometry (19th century)
II. Dactyloscopy (early 20th century)
III. ABIS (early 21th century)
IV. DNA (the next decade)

IMPORTANT TO NOTE

Up until now numbers were administratively assigned

Technology used to associate assigned numbers to identity (identity fixing with a lookup table)

This could change if DNA is ever used for de-duplication (see below)

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I. Anthropometry: The Measure of Man

- **Invented by Alfonse Bertillon long before Biometrics was invented**

- **Gave basis to idea that measurements of humans can be indexed & used to retrieve identity uniquely like a Dewey Book Index**

- **Was useful in identification of recidivist criminals but could not support indexing whole population**

- **Lost favor to Dactyloscopy**

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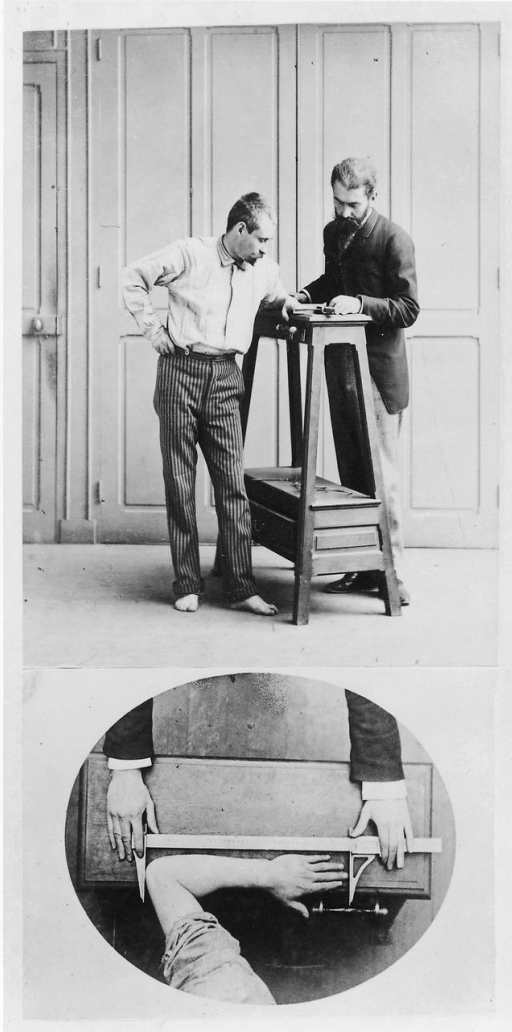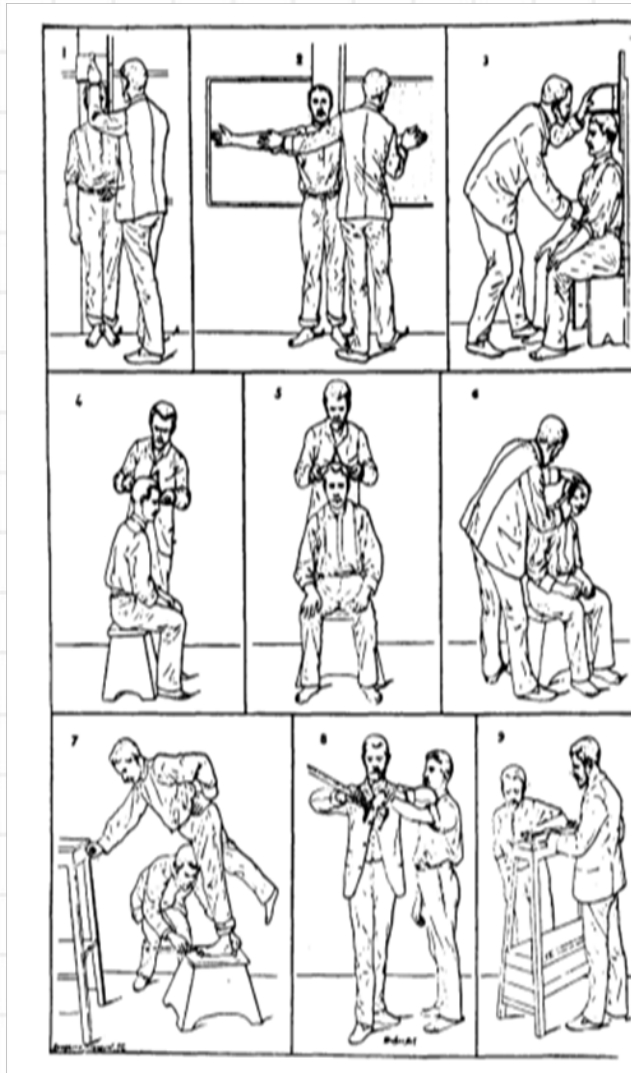
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- **Attractive: ability not only to trace identity but to prove it**
  - Courts accepted fingerprints as evidence as early as 1900
  - Became favored for criminal identification end of 19th century

- **First systematic use for fingerprints for whole population identity started in 1899 in Argentina**
  - Fingerprint all in order to eliminate the stigmatism of criminality

- **Hailed then as the technological basis for new world order**
  - Capable of indexing entire population
  - Held the promise for the Personal Number

- **Failed in realizing that vision: Labor intensive**

SISTEMA DACTILOSCÓPICO ARGENTINO
FUNDADO EL 1º DE SEPTIEMBRE DE 1891

ARCHIVO PARTICULAR DE JUAN VUCETICH

INDIVIDUAL DACTILOSCÓPICA

SERIE | SECCIÓN
MANO DERECHA | MANO IZQUIERDA

PULGARES
INDICES
MEDIOS
ANULARES
MENIQUES

SERIE | SECCIÓN

MODELO 1891

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- **Fully automated technologies for de-duplication**
    - Uses multi-biometrics
    - Modern IT architecture for scalability
    - Iris & 10 fingers proved to be critical for achieving required human resolvability

- **India & Indonesia showed how it can be done operationally**
    - Quarter billion humans already de-duplicated & declared unique

- **This is the first time where humanity could truly index more than a billion people & associate to each a unique number**

Number: Administratively assigned randomly. Link to person is fixed through biometrics & a lookup table

Similar to Dr. Almandos' scheme except not sequential

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- **Ability to uniquely associate a number with a human body does not stop with ABIS**

- **A cellular basis for human uniqueness emerged in the mid 1980s**
  - **May have its foundation in the human immune system**

- **The immune system performs identification to recognize if a cell came from self or from an outside alien body**
  - **A version of homeland security**
  - **Identification as the basis for survival**
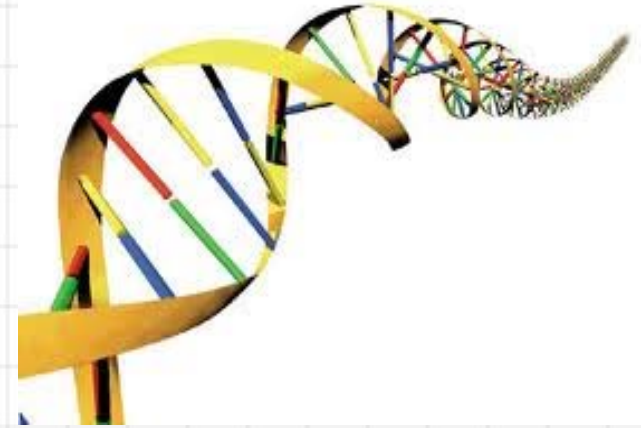
Identification is innate to human existence & finding a cellular basis for it is revolutionary & goes beyond scientific curiosity. It has fundamental implications to future of human rights

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A Derived Personal Number

- **Short Tadem Repeats (STR): highly variable regions of the non-coding portion of the human DNA**

- **Number of repeats at each site differs from one person to another**

- **Particularly interesting 13 sites (x 2 for both sets of chromosomes)**

- **Counting repeats at 26 sites derives a "unique number" of 26 digits for each human**

- **Not administratively assigned**

- **Implication is profound especially now machines exist that automatically extract that number in less than 60 minutes from a buccal swab**

13 CODIS Core STR Loci with Chromosomal Positions

TPOX
D3S1358
D5S818   D8S1179   TH01
FGA   D7S820   VWA
CSF1PO

1 2 3 4 5 6 7 8 9 10 11 12

D13S317
D16S539 D18S51 D21S11 AMEL
AMEL

13 14 15 16 17 18 19 20 21 22 X Y

Example of a Personal Number:

(15,17)(15,16)(23,27)(12,13)(28,30)(12,18)(13,13)(12,12)(10,11)(8,11)(7,8)(6,9)(9,13)

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Identity Surveillance

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The Dangers of Unitary Identity

- Unique ID schemes are important tools in the service of social good

- But they come fraught with danger

- The danger: Identity Surveillance

1

Identification Technologies can lend themselves to (misguided) mission creep such as temptation to predict behavior from enrolled identity data (see next slide)

2

More seriously: the accumulation of audit trail data associated with unique identity creates opportunities to gain insight into an individual's life that goes beyond what one gleams from seemingly unrelated actions

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WE: Futuristic Novel by Yevgeny Zamyatin

- **Zamyatin recognized in 1921 the relationship between a government assigned number and the utter obliteration of privacy**
  - This was at the time when mainstream media was hailing identity technology (dactyloscopy) as utopic (even the liberal New York Times was for Unique Identity and universal fingerprinting)
- **Elements of his novel included:**
  - Government assigned numbers that replaced personal names
  - Homes that had glass walls so a person was constantly under surveillance by neighbors and passersby
  - The indoctrination in people from early age that it is their civic duty to report suspicious activity or odd behavior ("*if you see something say something*")

WE

YEVGENY ZAMYATIN

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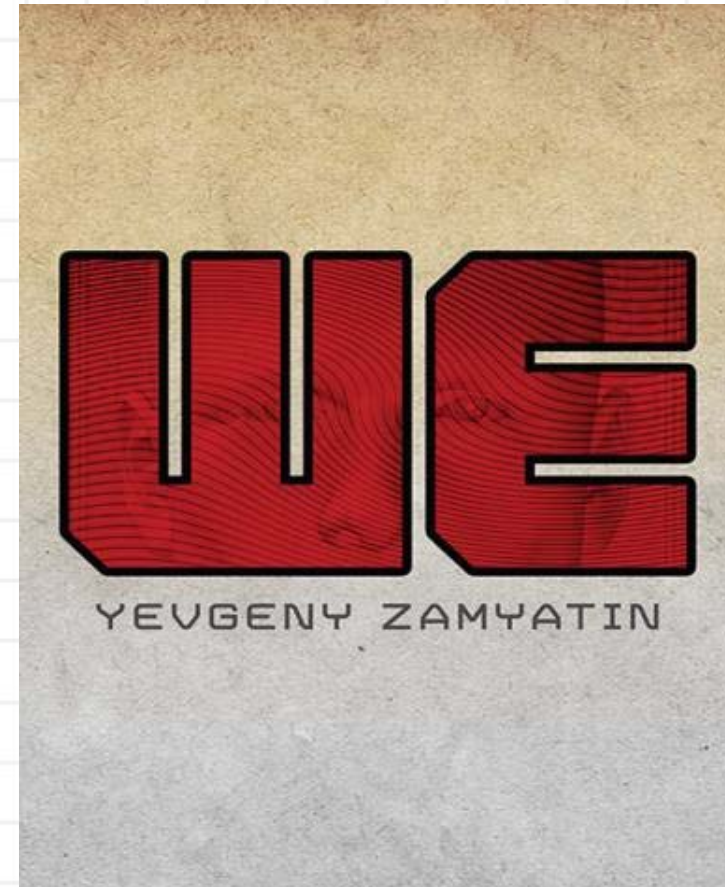
Correction

Surveillance

Identify & Treat

Predict & Prevent

Learn From History

Anthropometry	Argued were predictive traits of character. Crime could have been predicted by looking at a person's physical measurements
Dactyloscopy	Advocates of fingerprints argued they had found outward sign of inward character

Could tell a bad person by looking at their fingerprint patterns; even before they commit a crime |

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- **For the first time we have something that could possibly predict character traits**
  - Could predict temperament, behavior, disposition, etc.
  - Propensity for illness and health defects
  - The potential to read something more than just a unique number

- **Mission Creep: Difficult to give convincing assurances that DNA profiling for all time will be restricted to simply counting STRs, especially when you have the DNA samples of individuals which can survive perpetually**

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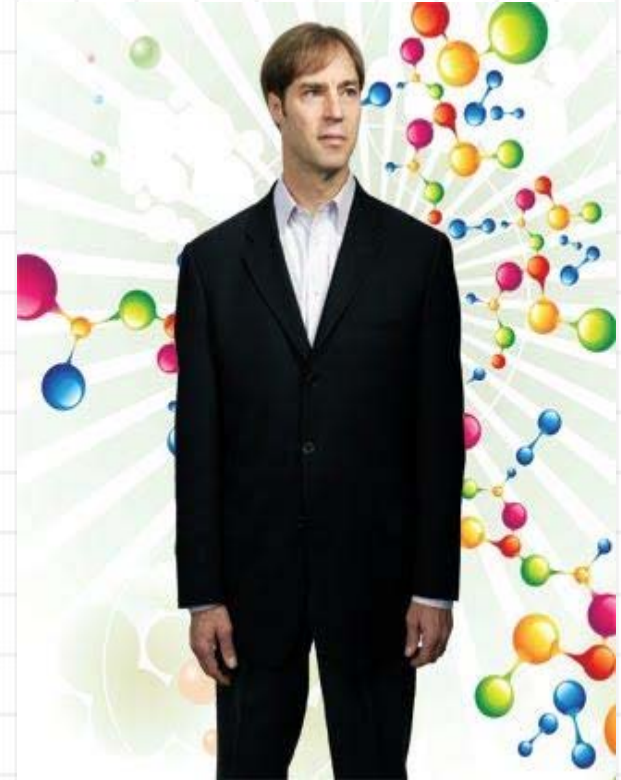
Or the Accidental Databases

– *Megasize databases that contain biometric data or information and that are not the direct outcome of controlled enrollments but are a byproduct of biometric-facilitated use*

Whether we are crossing borders or paying for food using pay by touch, As we use biometrics in the ensemble of transactions that constitute our lives we are leaving behind a trail, a foot print of actions, which by default accumulates into databases.

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- **The Accidental Databases provide temptation for another sort of mission creep**
  - "fishing expeditions"
  - Using recorded past actions to predict future ones

- **Gold mine for applications that sift through data to extract actionable intelligence**
  - Link analysis for enforcement applications & policing
  - Targeted marketing & consumer research
  - Social vigilante applications

- **Having Unitary Identity makes escaping this type of surveillance a whole lot harder**

Today, if an email address is spammed you can abandon it and invent a new one. But if your UID is spammed or targeted the consequence are a lot more serious

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2 Not Just Big Brother: Big Business

- **The threat of identity surveillance is not just a Big Brother issue. It is Big Business**
  - Big enterprises are paying top salaries for statisticians & putting them in data centers to try to predict consumer milestones which can trigger buying decisions. This is an ARMS RACE

- **This is the true loss of privacy**
  - When your actions are logged and monitored & exploited to target & influence your daily decisions. Commercial control robs us of a fundamental freedom & interferes with the right to be left alone.

- **The problem with privacy laws today is that they have not reckoned with fact that consolidation of data is much more invasive than just a collection of publicly available individual facts about us.**
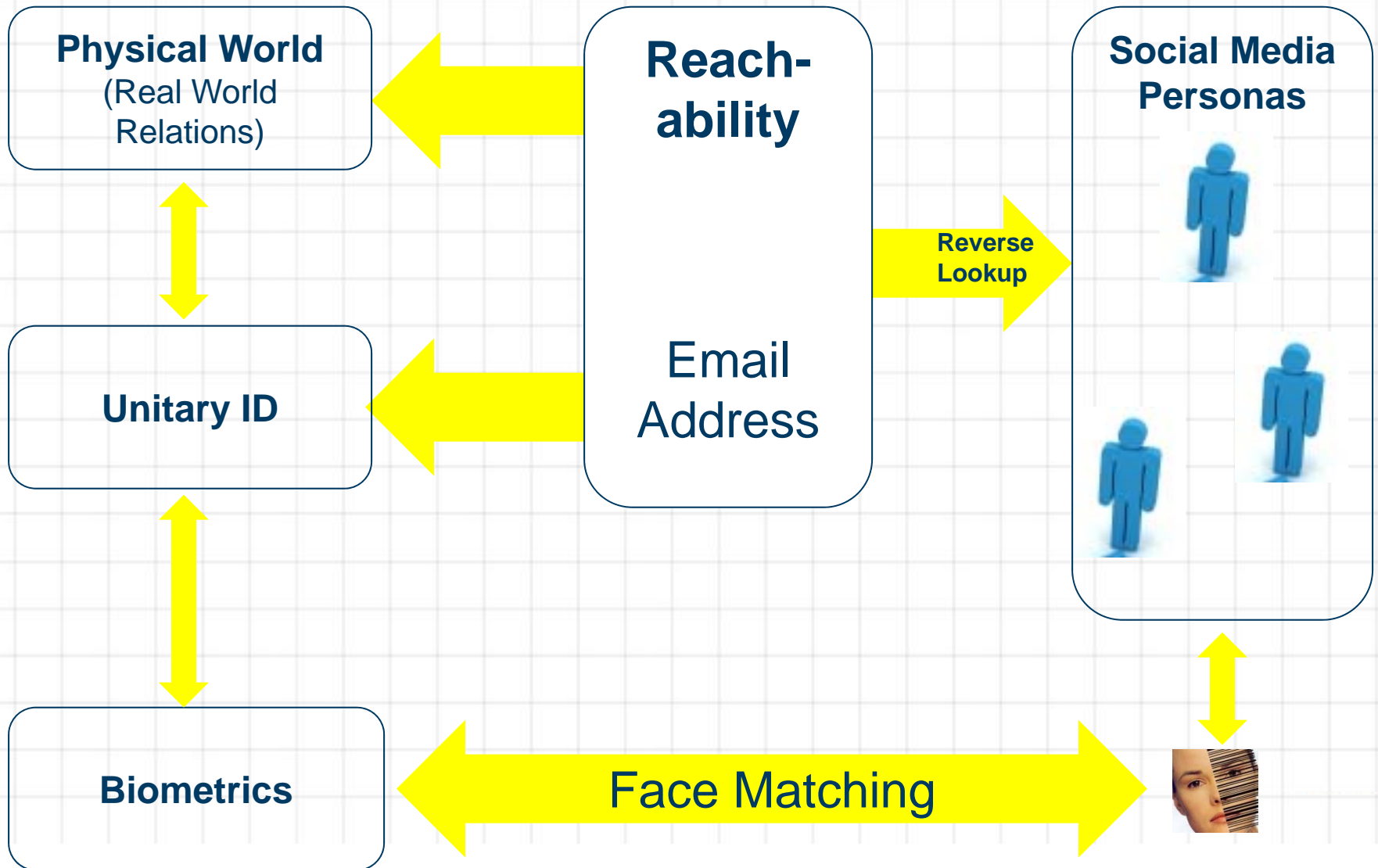
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Identity Linkage

Online & Offline & Social Media Personas

THIS SECTION WILL NOT BE PRESENTED. IT IS PROVIDED IN THE HANDOUT FOR REFERENCE

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Two Major Pathways

Physical World
(Real World Relations)

Reach-ability

Email Address

Social Media Personas

Reverse Lookup

Unitary ID

Biometrics

Face Matching

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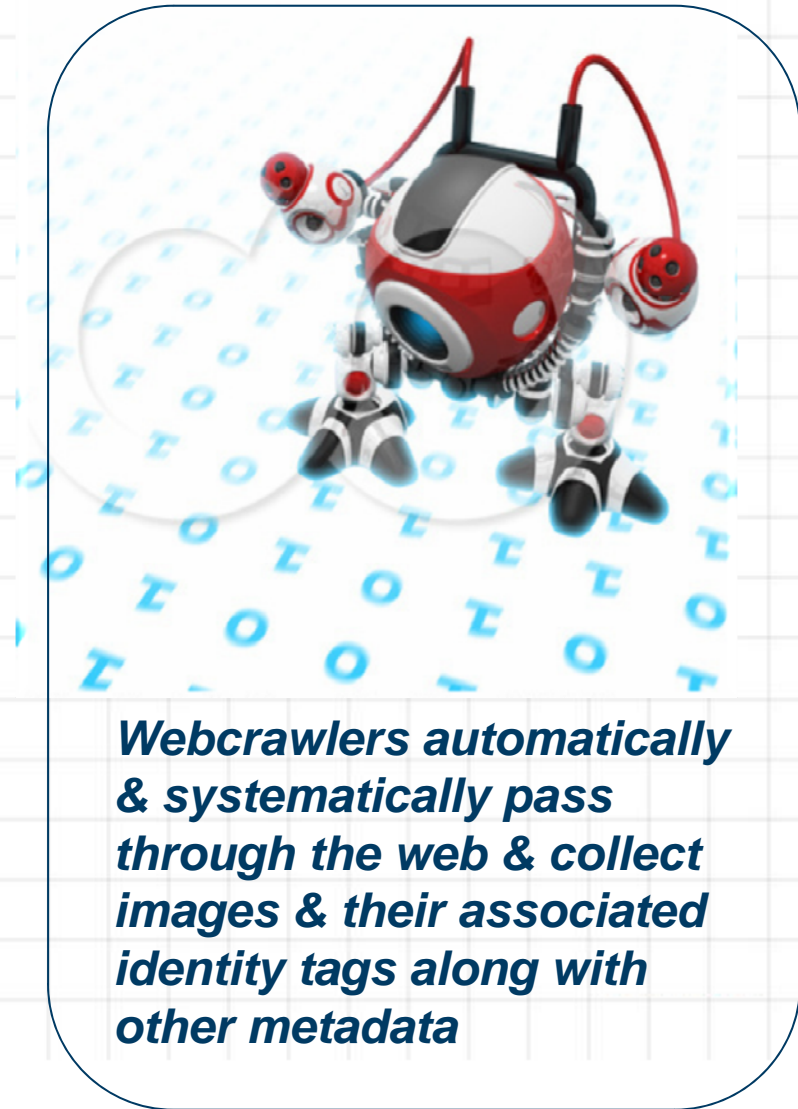
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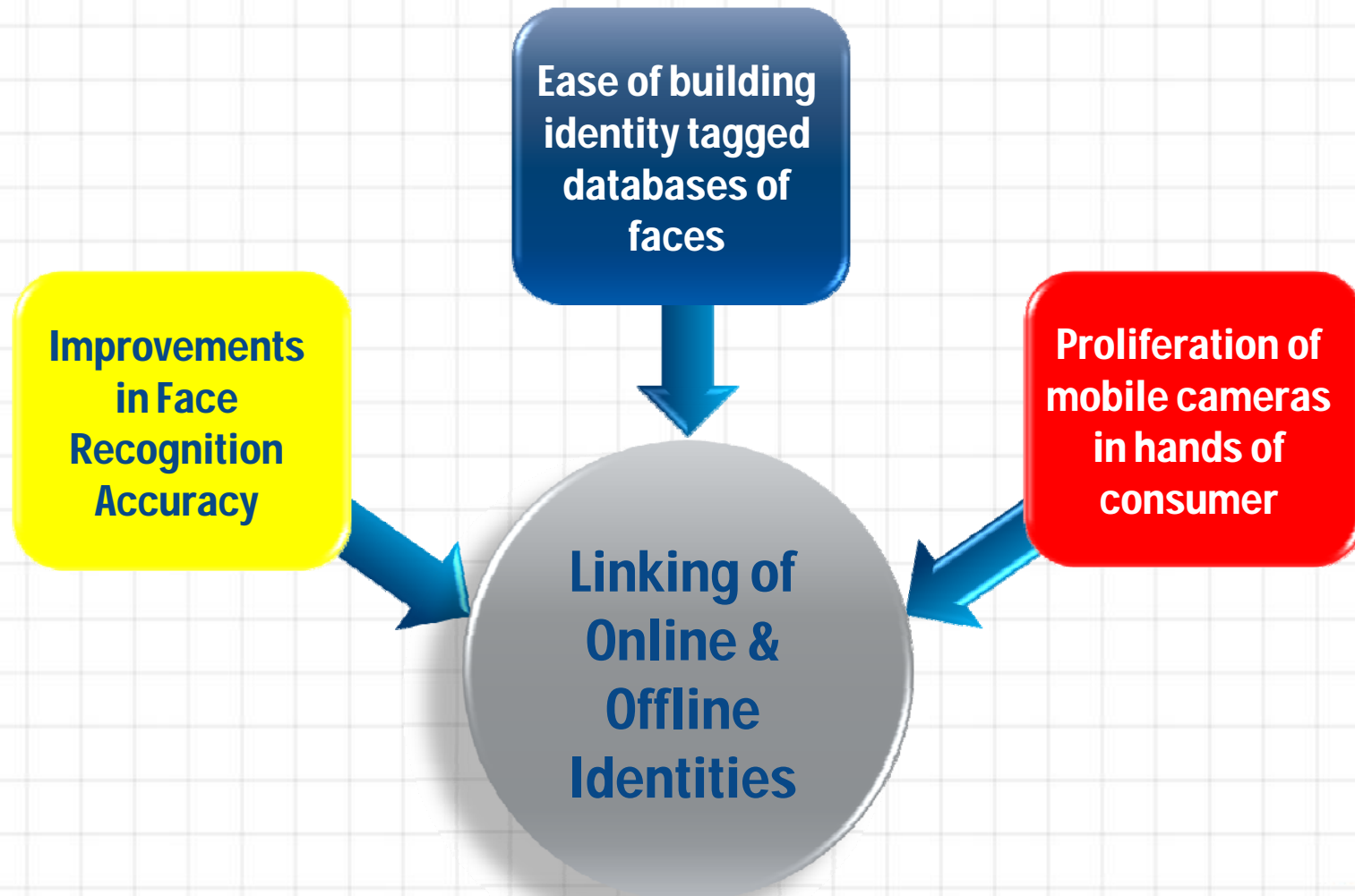
Identity Data Over the Web

- **Proliferation of *Personally Identifiable Information* (PII) on the web**

- **Massive image stores containing faces, Identity tags, GPS tags**

- **Many are suitable for extracting a biometric (faceprint) & linking it to an identity**

- **Sources**
  - **Completely open websites (events, corporate websites)**
  - **Social media profiles**
  - **Search engine image caches**

Variety of social media apps already emerged that use face recognition

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Furthermore: Harvesting Identity Images

- **Massive identity databases can be built by "harvesting the internet"**
  - No enrollment is needed

- **The *improvised civil register of strangers***

- **Building databases of identified faces has never been simpler through this mechanism**
  - Megasize is possible
  - Estimate that Google today has a databases of identified human faces that is several times larger than the population of the Earth

Webcrawlers automatically & systematically pass through the web & collect images & their associated identity tags along with other metadata

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Piercing The Veil of Anonymity

- **A photograph snapped by an iPhone**

- **Searched, through face recognition, against a database (a register) of known persons harvested from the web**

- **Name or email address used, through search engines, to develop a profile**

- **Piercing the veil of anonymity in the physical world**

- **Anonymity versus privacy**

*We may have lost: Reasonable expectations of privacy in a public place?*

Can we preserve: Reasonable expectations for anonymity?

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Reputation Revisited

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Reputation

- **Most important derivative of identity**
- **Controls our ability to function in our chosen society**
- **= identity as perceived by others or in their collective memories**
- **Shaped by our individual actions**
- **Determines our level of earned trust and access**

<u>Shakespeare on Reputation</u>

Reputation. Reputation. Reputation. O, I have lost my reputation. I have lost the immortal part of my self and what remains is bestial
--Cassio in Othello

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Reputation Then & Now
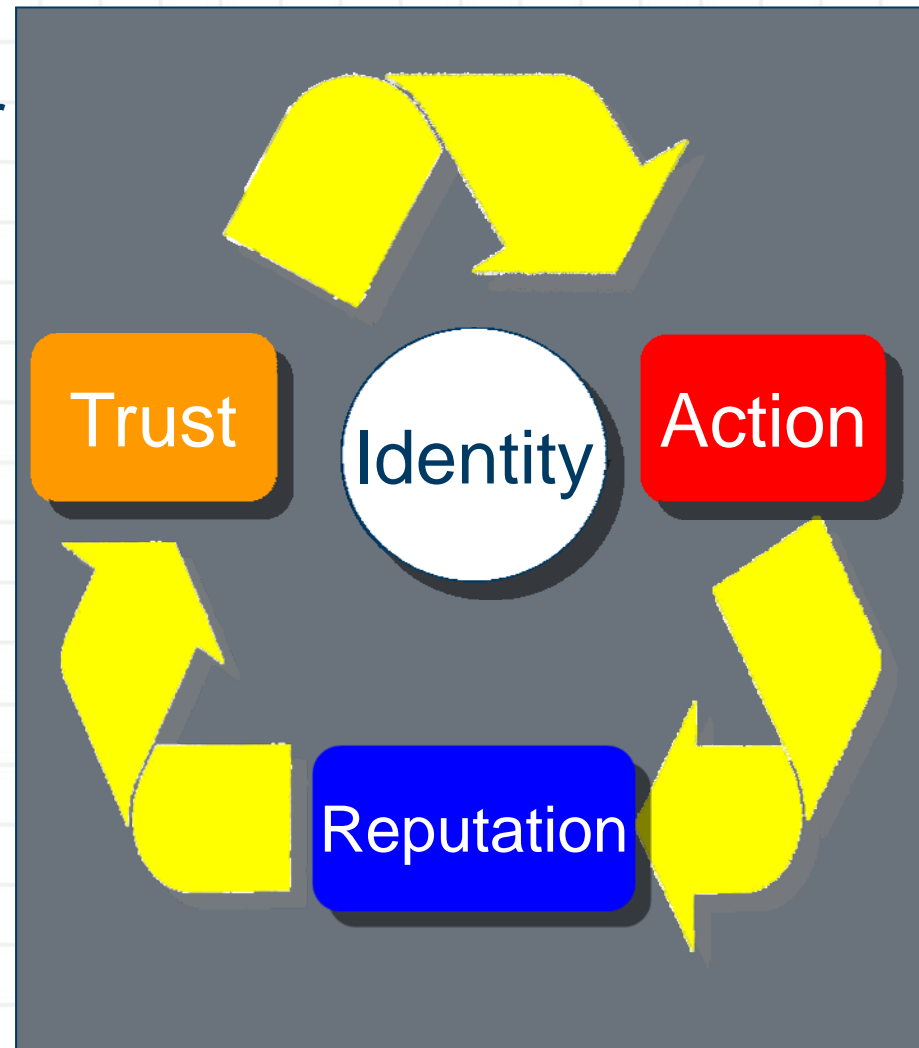
Then

Memories were finite in time (people forget) & space (people only gossiped about who they knew—their neighbors or celebrities)

Reputation was fragmented

Information scattered forgettable localized

Now

Actions can be documented online & accessible to a much larger group

Indelible and searchable consolidated record about an identity

Gossip engine: Google

Network effect: once out of the bag cannot be contained

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- **Safeguarding one's reputation has become a much harder task**

  - Actions are easier to track, record, associate to a fixed online-offline identity

- **Makes getting a second chance & rehabilitation much harder**

  - Escape from trivial mistakes of youth

  - Or failed experimentation of self expression

- **The Chilling Effect: If it becomes clear that one cannot escape mistakes of one's past, this will change human behavior**

- **Coupled with the other information and identity technology advances, could create an environment with negative implications to human values and freedoms.**

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# A Legal Framework

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The New Challenges

- **Increasingly, societies are challenged in fundamental ways to reconcile their notions about identity with these advances in information & identity technologies**

- **Increasingly, there are calls for new regulations & legislation to control these disruptive forces**

- **Normal kneejerk reaction driven by fear instead of rational analysis**

- *NOT convinced the solution will come through new governmental measures or new bill of rights*
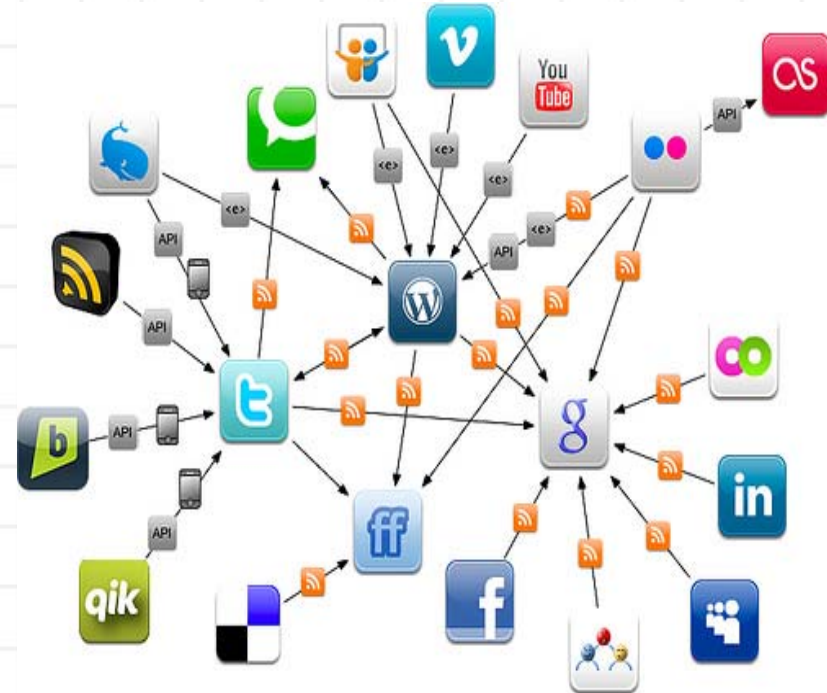
Surprisingly this is *NOT* the first time society was challenged in this way. It happened more than 120 years ago. Difference is a matter of scale.

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The Other Information Revolution

- **Similar to atmosphere that prevailed in the last decade of 19th century (1890-1900)**

  – **Commoditization of printing press technology created a mass media revolution (cheap tabloids; pictorial press with lithography stimulated massive consumer interest)**

  – **Photography entered mass market (Kodak introduced in 1888; detective & concealed cameras were creating "camera fiends" & a voyeur craze invading privacy)**

  – **Victorian society with its conservative norms was being challenged by convergence of these factors**
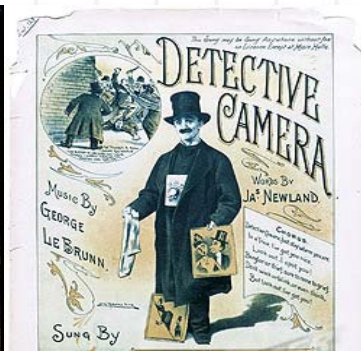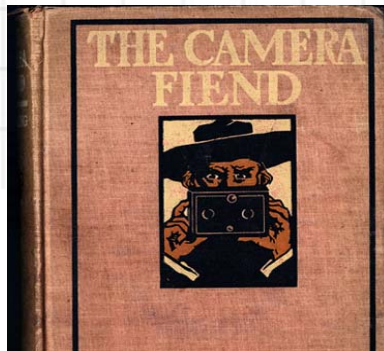
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Back To the Future: Warren & Brandeis

- **1890: Warren & Brandeis in response write their now classic common-law article …**

- **Establish Invasion of Privacy as a Tort**

- **The Tort includes:**
  - **Intrusion of solitude**
  - **Public disclosure of private facts**
  - **False light**
  - **Appropriation**

- **Tort survived test of time, today:**
  - **Recognized by all 50 states**
  - **Supported by extensive case law even as it constantly bumps against 1st Amendment (free speech)**
  - **Had a persistent & enduring influence on US legal approach to questions on privacy.**

- **Provides inspiration for how to deal with current challenges surrounding identity**

THE RIGHT TO PRIVACY

by

Samuel D. Warren
and
Louis D. Brandeis

ornaments were a string of gold beads around her throat. Her h... was of white roses, and the ... to the head b... The eight br... ayard, sisters ... Miss Crebbs, drews, Miss Ka... resses of these ... mull,

Tort

A tort in common law jurisdictions, is a civil wrong not arising from a breach of contract. It is an act that injures or causes harm or loss to someone in some way, and for which the injured person may sue the wrongdoer for damages.

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The Identity Tort?

- **Recognize identity & everything around it (name, reputation, faceprint, fingerprint, iris code, etc.) as belonging exclusively to the individual being identified**

- **Any misuse of someone's identity is a tort (larger than Invasion of Privacy tort). Anyone harmed through misuse can sue to recover damages**

- **No need for new legislation or new government regulations. Simply elevate identity to a personal property.**

- ***Identity as personal property is not universally evident.***

  – *May be in conflict in countries where government interferes with the ability of individuals to freely control their identity*

The point of Identity as personal property is NOT to place it under the jurisdiction of property law. But in order to entitle the person for relief: Any harm caused to an identity is harm caused to its rightful owner who is then entitled to recourse under Tort Law.

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Summary : Outline of Best Practices

Legal

Recognize identity & everything related to it as personal property.
Recognize the Identity Tort

Policy

If identity is to be fixed & made unique, build mechanisms to allow for changing it. Accept aliases in legitimate privacy protecting circumstances.

Learn from the lessons of eBay

Technical

Minimize generation of data around identity
Do not store audit trails beyond a minimal period of time
Post on websites that have disabled webcrawlers (except those coming from entities that committed to a declared privacy policy)
Prevent linkage of online & offline identities

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"In our rush to embrace tools of modernity we should not ignore their threats to human values. Next generation – which seems oblivious to them at the moment— will blame this generation for failure to alert them to the dangers when it has become too late."

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WHEN ALL IS

SAID AND DONE

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