Rapidly Scaling Robot Identification

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Note to Reader:

I have been writing about rethinking civil registration systems since 2006

- ▪ "The Challenges with Identity Verification"

Over the last year and a bit, I have written 32 papers, including two proposals, on the impacts from the technological tsunami. Here's a listing of them, by subject area, with links to each one:

- Thought Papers
  - Artificial Intelligence & Legal Identification – A Thought Paper
    - ▪ Artificial Intelligence & Legal Identification
  - Human Migration, Physical and Digital Legal Identity – A Thought Paper
    - ▪ Human Migration, Physical and Digital Legal Identity
  - Digital Twins/Virtual Selves, Identity, Security and Death – A Thought Paper
    - ▪ Digital Twins/Virtual Selves, Identity, Security and Death
- Proposals and Discussion Paper:
  - Bot Legal Identity Proposal
    - ▪ Proposals for Identification of Bots (Physical and Virtual Robots)
  - Human Legal Identity Proposal
    - ▪ Proposals Paper – Incremental Approach to Implementing New Age Legal Identity
  - Background Information on Legal Identity, Data, Consent and Federation
    - ▪ Background Information on Legal Identity, Data, Consent and Federation
- Example story of an identity's lifecycle
  - The Identity Lifecycle of Jane Doe
- Technological Tsunami Wave of Change
  - Harnessing the Technological Tsunami Wave of Change
- Legal Privacy Framework for the Tsunami Age
  - Legal Privacy Framework for the Tsunami Age
- One-page summary
  - One Pager - The Age of AI, AR, VR, Robotics and Human Cloning
- Technological Tsunami and IAM
  - Technological Tsunami & Future of IAM

- New age identity, data, and consent
  - [Privacy Gone – AI, AR, VR, Robotics and Personal Data](#)
  - [I Know Who You Are & What You're Feeling - Achieving Privacy in a Non-Private World](#)
  - [Consent Principles in the New Age – Including Sex](#)
  - [Policy Principles for AI, AR, VR, Robotics and Cloning – A Thought Paper](#)
  - [Legal Person: Humans, Clones, Virtual and Physical AI Robotics – New Identity Principles](#)
- Kids and Parents Privacy
  - [Young Children Data Privacy Challenges in the Tsunami Age](#)
  - [Kids Privacy in Non-Private World - Why Even Super Hero's Won't Work](#)
  - [Children & Parent Privacy in the Tsunami Age](#)
- Robotics, Clones, and Identity
  - [Legally Identifying Robots?](#)
  - [Rapidly Scaling Robot Identification?](#)
  - [Virtual Sex, Identity, Data & Consent](#)
  - [I'm Not a Robot](#)
- New age civil registration legal identity framework
  - "[Why the New Age Requires Rethinking Civil Registration Systems](#)"
  - "[What New Age Civil Registration Won't Do](#)."
- New Age Assurance
  - "[New Age Assurance – Rethinking Identity, Data, Consent & Credential](#)"
- Deploying AI, AR, VR, robotics, identity, data and consent in challenging locations
  - "[Where Shit Happens](#)"
- Protecting the civil registration/vital stats infrastructure
  - "[When Our Legal Identity System Goes, "Poof!](#)"
- New age architecture principles summary
  - "[New Age Architecture Principles Summary](#)"
- Leveraging Blockchain and Sovrin
  - "[A Modern Identity Solution: New Age Vital Stats/Civil Registries, Self-Sovereign Identity, Blockchain, Kantara User-Managed Access & EMP Resistant Data Centres](#)"
- Creating Estonia Version 2.0
  - "[Creating Estonia Version 2.0 – Adjusting for Changes From 1999 to 2018](#)"
- New age civil registration/vital stats design, implementation & Maintenance Vision
  - "[Guy's New Age Civil Registration/Vital Stats Design, Implementation & Maintenance Vision](#)"

All papers are available off my website at [https://www.hvl.net/papers.htm.](https://www.hvl.net/papers.htm)

Note to Reader II:

This thought paper deals with my ideas on the challenges of designing a scalable legal robotic identification solution that can deal with enormous volumes of robots.

Rapidly Scaling Robot Identification?

After reading my latest paper on robotic identification, a senior internet industry person asked me this question - "We can create new robots at insane speeds - might that overwhelm an ID system?"

I had been thinking about this and sent back my initial thoughts. In this post, I'll lay out my thoughts using some use cases. Note: As there's a lot to think about, this is a long post!

Background

As mentioned in the post referenced above, robots are not just physical. They also include avatars, virtual selves/virtual assistants, etc.. These may be AI generated, or created by companies, programmers or open source software that can do many, many things. Therefore, when reading this post, don't think of robots as just physical.

How fast can non-physical robots be created? VERY fast. One can see, in the not too distant future, that a virtual self can be almost instantly created AND that multiple copies can be created. Further, as in today's AI/AR/VR worlds, the virtual self may or may not look like you. It also will likely be much "smarter" than you as well.

If one imagines a world 2-5 years from now, it's likely that many millions, or billions, of people will be creating virtual selves, virtual assistants, avatars, in addition to AI generated ones, each second. This can create the "insane speeds" quoted above.

Then consider physical robots. As robotic automation improves, it's also highly likely that price points will drop and production capacity improves.

Lastly, consider if these robots need to be registered or not? In my previous post I used an example where I had Jane Doe acquiring a robot and not registering it. This makes sense...in today's world. In tomorrow's world it might not. Why? The sheer number of robots might require all of them to be registered.

I have a privacy principle that a person should have the right to live off the grid if they so choose. This also applies to their robots.

In my prior papers on a new age civil registration service, I state that the service must be run separately from other identity and authentication services. There MUST NOT be one mother of all databases containing a person's legal identity verification plus their contact information, etc. This must include robots.

So, to any privacy folks reading this paper, please keep in mind that registration doesn't necessarily mean that a person, or robot, can be traced from the identity registration. It is simply a legal identity registration system separate from other identity systems.

On to the use cases...

Use Cases

- **Self-created**
  - Jane Doe uses robotic open source software to create her own virtual selves, or in the future physical ones.
- **Free Robots**
  - Jane Doe uses Acme Robotic Manufacturing Inc. to create robots for her. Acme uses advertising on their website to offer free limited functioning robots.
- **Paid for Robots**
  - Jane Doe pays Acme Robotic Manufacturing Inc. to create robots for her
- **Large Scale Robotic Production**
  - Acme Robotic Manufacturing Inc. produces hundreds of thousands or millions of robots, each day, that are used around the planet. These range from free robots to paid for ones sold to individuals, as well as other enterprises, to use.
- **Jane Lends a Robot to a Friend**
  - Jane Doe lends a robot to her friend John Smith. John will then use the robot to do things and then "return" it to Jane.
- **Robotic Brokerage**
  - Robotic Brokerage Inc. specializes in buying, selling, leasing, renting, as well as offering robotic services, globally. Robots and contracts may last only seconds to hours, days, months and years.

Challenges

The use cases pose a number of challenges:

- **Uniquely creating a robot's unregistered identity**
  - In my prior paper I have an robotic identity created "12345". Given the sheer volume of robotic identities being created, how will "12345" be unique? It could possibly use digital certificates BUT this can be potentially too costly for some.
- **Legally determining who created the robot**
  - How will proof of creation be determined?
- **Determining if a unique unregistered robotic identity already exists**
  - When 12345 is being registered, the new age civil registration service needs to be able to globally search all other civil registration systems to see if 12345 has been registered. Then, it can create it's own unique legal identity for 12345 (in the prior paper this was "abcde").
- **Registering 12345**
  - There should be global standards on the way a robotic identity is legally registered. This should be to minimize any potential "identity collisions", where two separate robots are given the same legal identity.

- **Publishing robotic identification in the public domain**
  - Robots identities, both unregistered and registered, should be posted in the public domain. Blockchain, or something like it, is a good tool to use.
- **Determining who a robot is linked to, i.e. a human or an enterprise**
  - This requires external, legally defensible contracts assigning ownership of the robot. The recognized authoritative sources must then be accessible to the new age civil registration service to then link the human to the robots. This is where automated, smart digital contracts, published in the public domain, will likely have to be used.
- **Leasing/renting robots**
  - This should be mostly outside the scope of the new age civil registration system. Like cars today, the VIN number is the legal identification of cars and then referred to in car contracts. The same should apply to robots, i.e. the unique legal identity given by the new age civil registration service should be then referenced in the contracts. However, there is one area where the new age civil registration might be involved...
- **Delegating legal identity verification to others**
  - The robot may or may not contain its own Sovrin/Blockchain legal identification as well as one denoting it's a robot anonymously. I can see where people like Jane will want to lend the robot to a friend, John Smit, and then transfer "some" of the robot's legal identity rights to John. The technology, business processes and laws need to be well thought through to address this. Note that in the prior paper, I state the limitations from using Blockchain in legal identity verification. Someone might maliciously obtain the secret key. Therefore, the identity assurance from using this is low to medium only.
- **Churn**
  - There will be a very high number of robots being created, ownership transferred and then terminated. Therefore, as it applies to robots, it requires all new age civil registration systems to be highly available and automated wherever possible.
- **Termination**
  - Will robots be terminated? What are their rights? How will terminations be done, legally speaking? One can easily see where criminals will want to use robots maliciously and then terminate them in an illegal fashion to cover their tracks. If and when a robot is legally terminated, there needs to be a process for doing this. The process should be mostly automated, documenting changes in the civil registration setting as "terminated" and then publishing on Blockchain or whatever. This must be well thought through since, in many cases, it will end up in a court of law asking for certified legal proof that a robot was terminated.
- **Automating all of the above**
  - We are building new age civil registration systems that must work together, globally, each and every second. The sheer volume will require automation of most parts of the process, i.e. from initial robotic identification, legal contracts establishing creator/owner, legal registration, change of ownership and termination, with all of this instantly published in the public domain.

One More Use Case

Now let me challenge existing thinking a bit more, with another use case...

- **Operating Across National Domains**
  - o Jane Doe lives in one of four countries; China, US, EU or Russia. She has multiple robots, both virtual and physical, that work for her, on her behalf, in the other countries.

This use case highlights the following coming challenges:

- **"Work permits"**
  - How is a country going to license work permits to virtual selves or physical robots from another jurisdiction? As we digitize our economies, the sheer volume of this occurring will soar.
- **Tracking what virtual selves and physical robots do**
  - The world is not always a pretty place. Therefore police, intelligence agencies and criminals will take an interest in exploiting any weak spots they find. Many people will want to "cover their tracks". This is what I see as the beginning of the new age of robotic cybersecurity.
- **Political challenges**
  - In today's world, each country sets their own laws and regulations with many, many differences between them. In today's world, it already results in the vast number of cybercriminals working from offshore exploiting weaknesses in other countries laws.
  - Now, consider the future where robots are used almost everywhere. It will require standardization of civil registration laws, business processes and technology across the planet. It also requires standard privacy laws protecting us and our robots' privacy. This will likely be hard for some countries to accept. Yet without it, robotic identification chaos will reign.

Summary

This is a thought paper. The use cases illustrate the legal, business process and technical challenges facing us today.

While one can agree or disagree with portions of the paper, I hope that most readers will be nodding their heads thinking, "We need to address this now!" With the revolution already unfolding, the long lead times to create new laws, business processes and securely implement the technology means we can't wait a few years to commence solving this.

I am looking for early adopter countries to work with me on this. If this paper resonates with you, please feel free to widely distribute it and/or contact me.

With kind regards,

Guy Huntington

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About the Author

Guy Huntington is a veteran identity architect, program and project manager who's lead as well as rescued many large identity projects with many of them involving identity federation. His past clients include Boeing, Capital One, Kaiser Permanente, WestJet, Government of Alberta's Digital Citizen Identity and Authentication Program and Alberta Blue Cross. As one of his past clients said "He is a great find, because he is able to do high quality strategic work, but is also well-versed in project management and technical details, so he can traverse easily from wide to deep. With Guy, you get skills that would typically be encompassed in a small team of people."

Guy consults globally on the incoming technological tsunami wave of change.