

H2X = Human to Everything Digital

Technology has proven to be excellent at connecting one machine to another and one data center to another. Now it is being used to connect our vehicles to everything (V2X). Still, while the technologists have been able to communicate and modify the digital ecosystem, most of humanity lacks the tools it needs to be well-served by this new technology. It is time to ensure that all people can access the benefits of technology and not just the technologically literate members of society. And it is past time to ensure that this access to digital technology does not expose those humans to risks that they cannot comprehend or defend against.

The successes of technology connecting humans to everything.

According to reports from 2022, about 73% of the world's population over the age of 10 has access to a mobile phone. (ITU, 2022) This includes a significant portion of the developing world, highlighting the widespread reach of mobile technology. Every country investigated had better than 50% coverage (Pew Center, 2024). In the US, 323 million adults and children over 10 have a cell phone out of a population of 373 million. The focus on the US is an artifact of the availability of data in the Pew report. Numbers may be better in a few countries, but far worse in others.

The failures of technology connecting humans to everything.

1. In the US that leaves 10 million adults and 40 million children under the age of 10 without a cellphone.
2. The complexity of some processes added to the difficulty of obtaining services even before digitalization. In one example the process of getting a medical procedure approved with multiple payers involved becomes impossible for an older population that may not have the technical skills. "This frustration is widespread and has serious consequences. A recent survey from the Kaiser Family Foundation found that 58 percent of people with health coverage say they encountered at least one problem using their coverage in the past year, and people with greater healthcare needs – particularly those receiving mental healthcare – were more likely to experience challenges." This has caused the US Executive to issue an order to improve the situation, calling out the healthcare industry specifically in their letter to CEOs. (Biden, 2024)
3. The safety of interchanges over the Internet is so bad that security experts are telling us all that we, the people, need to take extraordinary measures to ensure that no false claims are allowed. What this means is that if your 80-year-old father is denied access and cannot remember his password for an email account

that he has not used for 5 years, then he cannot get this medicine prescription filled. This should result in an emergency call to 911, that would get the authorities to fix the problem. Instead, all citizens must fill the safety gap created by the technology that is supposed to make life easier for us all.

4. Digital Credentials for people who do not have the ability to operate a digital device are not included in any of the standards now under development. This excludes 10 million adults and 40 million children in the US who have no cell phones. Under ADA that failure might be considered to be “reasonable accommodation”, rather than a violation of 50 million US citizens’ rights.
5. Even when an adult has a cell phone that they have been able to use for years to keep track of medical regimens and medicines can become unable to cope with emergencies. In one case an older couple were visiting their daughter in a distant city when an emergency required them to access medicines that had not been included in their suitcase. When they visited a local pharmacy they were required to supply script and medical records from an account that had an expired password. Recovery required access to an email account that was also not functional.
6. Wallets where the holder at one point-in-time is not the owner of the wallet do not fit into the current plans for a common wallet in the EU and elsewhere. The problem is that delegation of authority is not accommodated in any plan in development. This might be considered to be “reasonable accommodation”, rather than a violation of peoples’ rights. Here are a few cases where this is a necessity.
 - a. A wallet is attached to the job and is given to the person on duty for that shift.
 - b. A wallet is attached to a human that does not have the ability to operate it so the caretaker must be able to enter information for the human.
7. Edits below. Multi factor is turning into a nightmare. I struggle to get into my Microsoft account because you need to be logged into it on another device to receive a code. I end up rotating through three devices before I can get into my account. My MS Cashback account is also being held hostage there because they need me to add a phone number for an alias before they will release it, and even though they can send a 2FA code to my phone to log me in to make the alias, they won’t let me add the same phone number as the alias.
8. As far as Google, the Authenticator in the Google app, the one where you tap “Yes it was me”, has always worked for me but lately it seems to want to bypass it in favor of a passkey. I had one in keychain but there wasn’t an obvious way to

use it. It said I could make a new one and, honest to God, it said I needed to start with a device that wasn't mine and suggested to go to a public library.

- a. You can't make this stuff up.
 - b. Parents visiting with adult children and all got COVID. We ran into trouble with ordering medication for my dad who is 79, early Alzheimer's, but still in control of his own healthcare. My mom wanted to check on the Rx order with the Walgreens app to see if the meds were filled and to reduce the number of times she needed to run to the store. But she was not able to get my dad's consent to access his order because he needed his own account to do that. But he doesn't have a working email anymore and could not create an account. Then she wanted to check MyChart to see if his new diabetes medicine was ordered, but she couldn't access his record there either for the same. Same reason. So she's back to waiting on hold forever because she had to call all the providers directly.
 - c. When the multifactor is email or phone number there is no fallback that doesn't involve calling one or more human which is discouraged by one hour wait times. A better solution MUST be found.
 - d. Their father came to visit and needed medicine at the local pharmacy which is not the one he used at home. He did have a cell phone but lost access to the medical records because of inactivity. The child could not access the cell phone nor the father's medical records and so was unable to get the medicine needed. This was a person who had worked all his life, had retirement accounts, medical accounts, as well as a cell phone, and no one could figure out how to get him the medicine he needed to survive. Technology fails these people as well as other like indigenous tribes like the Cagots in France or any other country I have ever visited in this world. Technology leaves these people without the means to survive by themselves in this world. This is unconscionable.
9. The emergency use case became real for me during the recent hurricane that visited Florida and North Carolina. Florida was bad but NC was devastating. My dear friends, who live nearby, have family and friends there, as did I, but they suffered the loss and had injuries. Within two days, my friends stocked up their RV and headed to NC and were shocked at the destruction. Several days later, they sent me the message (below) that raised the communication challenge that

Tom raised two months ago and again earlier this month. [Here is the message I received from NC:

- a. "Private retired military personnel from Florida are desperately trying to find private helicopters to rescue victims. In other words the government is not only helping but are trying to prevent others from doing so (no way to communicate). For those interested, this link is a video by SEAL Shawn Ryan about several rescue teams in NC mountains now:
<https://youtu.be/KgPYPEnmYnc?si=0bxMPDvxydsxaP-s>

The failures of Wallets to be accepted.

Now that some wallets are being proposed for use in places like North Carolina and the EU it is becoming clear that there is no standard for what the minimum functionality of a wallet must be. Without them the verification devices in different parts of the world will not operate with wallets from other parts. The two cases of current interest are:

1. In North Carolina a law stipulates a student ID card issued by a state school (e.g. UNC) is a valid form of photo ID for voting. The law also calls out that photocopy/photograph of a photo ID on a phone/tablet is not a valid form of photo ID. Republicans are suing to block enforcement as this makes it easier to vote. But, this case hinges on the question: is a digital ID issued by the university to the student (or faculty) a valid form of voter identification under NC's voter ID laws? The suite claims this digital ID is not just a photo of a physical ID. But it's also not a student ID card (which is the language used in the law, and while we often colloquially call verifiable credentials & other digital IDs "digital cards", technically it's signed JSON—not a card). (ABC News 2024)
2. In the EU a new ENSIA commission called the EU Cybersecurity Certification Scheme on Common Criteria (EUCC) to adopt some of the Common Criteria Crypto schemes was created. The new EUCC scheme allows ICT suppliers who wish to showcase proof of assurance to go through an EU commonly understood assessment process to certify ICT products such as technological components (chips, smartcards), hardware and software. As currently imagined this solution will not work off-line.
3. When the Internet is not available, like natural or man-made catastrophes, life goes on and credentials need to be validated. All credentials that must continue to be available even if the Internet is not available and must be enabled on wallets that can be validated especially in extreme cases where human life or property is threatened.

An early attempt has been made in Kantara to create a specification for what a wallet must be able to provide to a verifier using the US Healthcare community as a paradigm. The [Kantara Mobile Assurance Statement](#) is a statement of the level of protection that the authenticator enforces to assure that a user retains control of the credentials used in authentication. This document was published in 2020 and could be revised to meet current challenges.

Impaired Individuals

Visually Impaired

The visual impaired population is expected to reach 1.75B by 2050. According to estimates published by the Review of Optometry on 29 March 2021, over 338 million people live with vision loss or moderate to severe vision impairment. Beyond that, 258 million live with mild vision impairment, and 510 million have visual impairment due to uncorrected presbyopia.

Visually impaired customers can now have greater control of every payment they make. For example, Thales and its partner Handsome, a Fintech specialist in inclusivity, have come up with a payment card that is paired with the cardholder's smartphone app, which vocalizes the transaction details. A description of each step – the amount, PIN validation, remaining attempts in case of incorrect PIN, the transaction is OK – is encrypted and sent by the card to the phone enabling the cardholder to hear the details and pay in full reassurance.

Cognitively Impaired

Including all sorts of impairments including the very young and the very old, it is a substantial part of the population that will need to express their rights and privileges when digital credentials are the normal method. In fact this requirement extends into death when the digital credentials must be validated and the digital property distributed. A new OpenID work group has been established to look at some of these issues. (Malar 2024)

Older Persons

October 1st marked the UN International Day of Older Persons. This powerful reminder of digital trust and identity's role in protecting vulnerable populations, including older adults who often embrace digital platforms like everyone else, is essential. Equally, it's essential to ensure accessible channels are available for those who may be challenged to go online.

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