

A PDF and a Prayer

What healthcare got right, and what every other industry would give anything to have.

Almost every engineer has heard this story before at least once in their career: the requirements are in the code. Not in a document. Not in anyone's head. In the code. Someone likely planned to document everything "later" and simply never found the time. It's a tale as old as time. In my experience you do usually get at least one good document and it's usually a quick-start guide to running the old system.

So you do what any sensible person does given these parameters: you start to reverse-engineer behavior like an archaeologist reading scratch marks on a wall, function by function, guess by guess, building the new thing against a target that will only ever show itself one click at a time. If it were only that simple. Of course no one wants to carry forward bugs, tech debt or dead code. So you need to make it better while also making it the same.

Stick around long enough in this part of the industry and you'll quickly see that this is not the story of one bad project. This is how modernization on most of the world's important software operates. A PDF, if you are lucky, and a prayer.

Then I crossed into healthcare interoperability, braced for more of the same, and found the thing I had never once seen an entire industry manage to do: somebody took notes. Not a person on the project, but the whole field.

What healthcare actually built

Start with the model. FHIR, the Fast Healthcare Interoperability Resources standard, is a shared way of representing the things medicine actually deals with, a patient, an observation, a medication, a claim, so that a system built by one company and a system built by its competitor can mean the same thing by the same word. That alone is more than most industries ever agree on. But a general standard is a language, and a language is only useful once people also agree on how to say specific things in it.

So healthcare did that too. USCDI, the United States Core Data for Interoperability, is a plain list of the data every system is expected to be able to exchange. That is the what. US Core is the set of FHIR profiles that pin down exactly how to represent each of those items. That is the how. One says these are the things that matter. The other says here is precisely how you will write them down, so nobody is left guessing.

Then, on top of that, the part I still find a little astonishing. For the real, messy, multi-party workflows, the ones that make people groan, checking what a payer covers before you order the test, getting a prior authorization, pulling a patient's history out of another organization, there are named implementation guides that spell the whole dance out. The HL7 Da Vinci guides read like a table of contents for the worst days in healthcare administration. Coverage Requirements Discovery. Documentation Templates and Rules. Prior Authorization Support. Clinical Data Exchange. Payer Data Exchange. Each one is a room full of competitors agreeing, in detail, on how their systems will cooperate on a problem none of them can solve alone.

And here is the piece that turns all of it from good intentions into something real. You can test against it. There are connectathons, where implementers bring their systems into one room, virtual or not, and plug them into each other on purpose to find out what breaks. There are conformance suites that do the same thing automatically. Inferno, which the government itself uses to certify whether a product actually meets the Cures Act's API requirements, hands you a pass or a fail, not an opinion. Touchstone runs well over a thousand tests against the specification and tells you, precisely, where you drift from it. The standard has teeth. You do not get to claim you conform. You get to prove it, or find out that you cannot.

Why this is so rare, and why it matters

Take a step back and look how all the pieces come together. This is not a list of some general best practices. It is documentation, with a dictionary, a set of choreographies for the hardest workflows, the machinery to prove you followed them, and a regulator willing to make the proof mean something. That is not how standards usually go. In most of the world a standard is usually not much more than a wish.

The reason this matters is simple, and it is the whole difference between a standard and a wish. A standard whose conformance cannot be clearly tested is just a strongly worded suggestion. The moment there is a suite that returns pass or fail, the standard stops being a matter of opinion and becomes a matter of fact. Conformance you can prove is the thing that lets a system built by strangers, years apart, actually connect. Everything short of that is a prayer.

I would have never expected this from an industry this large, this fragmented, this full of competitors with every incentive to keep their data to themselves. It is one of the more impressive acts of collective forethought I have seen in any field. They built the road before most of us even knew we would need to drive on it.

The honest part

I want to be careful not to let gratitude curdle into a whitewash, because that would insult the work by lying about it. This same industry still has real and serious gaps. I have written about them before and I will again. A record can be complete and still fail to show the person inside it. A system can store everything while surfacing nothing. Those failures are real and the cost is real.

But the gaps were never in the foundation. The foundation is the part done right. The gaps come from what we build on top of it. That determines whether the whole person actually becomes visible to the clinician who needs to see them. Praising the forethought and pushing hard on the follow-through are not opposite positions, they are the same one held honestly. A house can only be built well on a foundation worth building on.

Thank you

I want to say the quiet part plainly, because it would be easy to praise this the way you praise weather, as if it simply happened. It did not simply happen. Somebody argued the model into shape across meetings that ran long. Somebody wrote the implementation guide for a use case most people will never think about once. Somebody showed up to the connectathon and plugged their system into a competitor's and filed the bug. Somebody has quietly maintained a test suite for years so the rest of us can find out, in an afternoon, whether we got it right. That is enormous, patient, mostly uncredited work, and it is not lost on me for a second.

It would be easy not to notice any of this if it was the only world you knew. I know what it's like to do thankless work. The production fire put out at two in the morning before the first user woke up to feel it. The performance problem fixed before anyone noticed enough to complain about it. The small disaster smothered while it was still a wisp of smoke and not yet a blaze. Work whose entire reward is that nothing bad happened, which is to say work that looks, from the outside, like nothing at all. I know what that costs, and I know how rarely anyone thinks to say thank you for it. So this is why I say thank you out loud, right now.

There is an old idea that a society gets great when people plant trees whose shade they will never sit in. I think about that more than I used to, especially as the one sitting in the shade. My transition to healthcare so far has felt less like Frodo trudging to Mordor and more like a day hike. Not without its hard stretches and a few blisters, but there is a trailhead, there are markers, and the path has clearly been walked before. There is still a mountain to climb, and a blazed trail does not climb it for you. I still have to want this, but there is a difference between a hard climb and a hopeless one.

I came to this from fintech, from insurance, from logistics, industries that would give almost anything for a foundation like this one and mostly never got it. So I know exactly what I was handed, and I know what it is worth. I have a lot to bring back the other way, hard-won lessons from fields that had to survive without it, and I intend to. But first I want to say the thing that does not get said enough in this work. Thank you. To the people who poured this foundation for builders like me, without ever knowing my name: thank you. I am building on it now, and I intend to give back to it as much as I can.

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