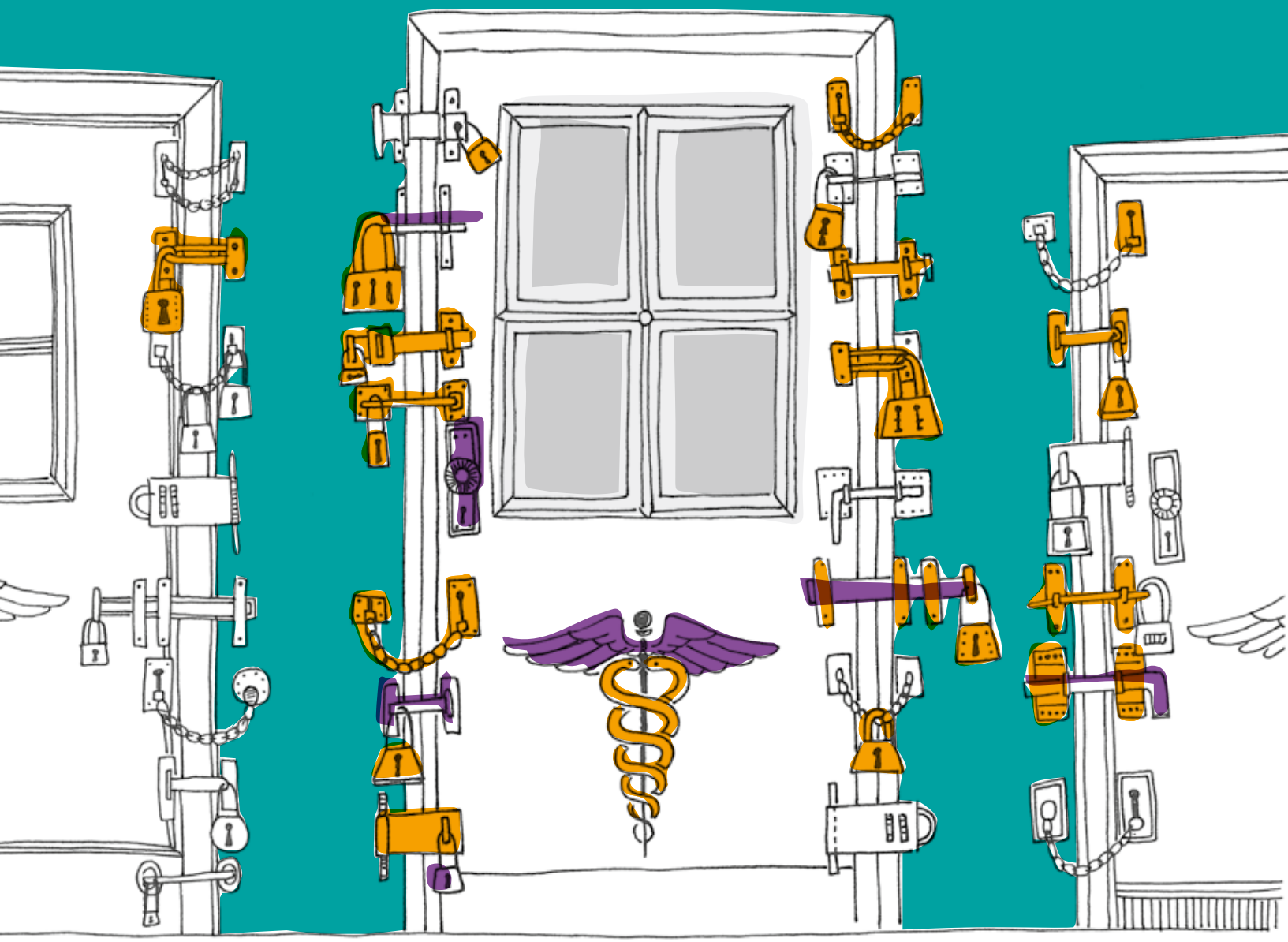
ACCESS ALL AREAS?



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Healthcare – Blockchain as a Game Changer

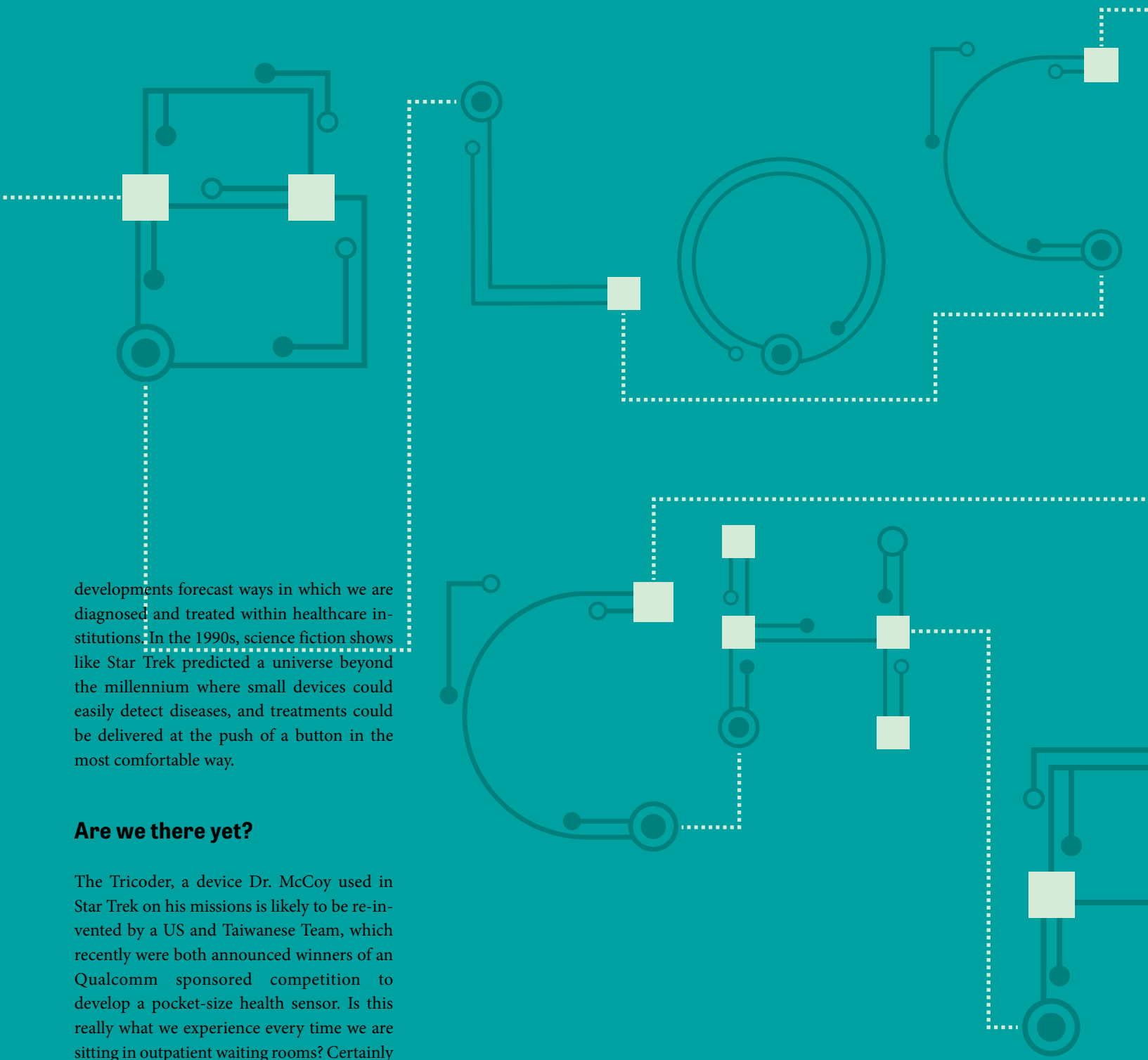
It's no secret that the healthcare system is not amongst the most performing industries. Nevertheless, if the healthcare system were a corporation, it would be among the biggest in each western country.

In 2015, the total amount paid into the system, or the revenues it generates, depending on how you look at it, achieved a record of €344 billion in Germany for example, which is enough to earn top rankings on the Fortune 500. But if it were a corporation, it would have the status of a "permanently failing organization" (see Meyer & Zucker 1989). The lack of ability to successfully adopt and implement innovations would be self-limiting, leaving behind unsatisfied stakeholders who, in this case, are the patients and taxpayers.

What are the reasons?

Why is healthcare not catching up with other industries when it comes to implementing technology to improve efficiency? Isn't there enough disruptive technology at hand? No moonshot innovations in the healthcare business?

Almost all of the so-called exponential technologies are expected to have implications on healthcare. Use case scenarios often refer to applications that change the way people take care of themselves. Disruptive



developments forecast ways in which we are diagnosed and treated within healthcare institutions. In the 1990s, science fiction shows like Star Trek predicted a universe beyond the millennium where small devices could easily detect diseases, and treatments could be delivered at the push of a button in the most comfortable way.

Are we there yet?

The Tricoder, a device Dr. McCoy used in Star Trek on his missions is likely to be re-invented by a US and Taiwanese Team, which recently were both announced winners of an Qualcomm sponsored competition to develop a pocket-size health sensor. Is this really what we experience every time we are sitting in outpatient waiting rooms? Certainly not. But when we take a look at innovations specific to healthcare, technological progress like smart devices, wearables, exoskeletons, operation robots, and artificial intelligence are all over the place.

So, we are not suffering from a lack of innovation in healthcare. But healthcare is suffering from a lack of effective adoption to horizontal innovations.

Among other things, this is due to unsolved data security and privacy issues. Is blockchain going to be the next big horizontal innovation especially for healthcare?

Blockchain is a distributed ledger, meaning there is no central administrator or centralized data storage. Instead, data can be stored in different systems. All data is replicated on every node across a network of nodes. In addition, the blocks are linked in chronological order via cryptographic signature. As a result, data cannot be manipulated without destroying the integrity of the whole system. The blockchain controls the access and permission layer, meaning it controls who should have access to which content at what time. With blockchain you are in control of your complete, full, and accurate history of your data.

There are interesting potential applications in blockchain healthcare, leveraging its security and privacy features:

1. Blockchain could be a basis for a universal electronic medical record system (EMR). Medical records are already digitalized. However, they are stored in different data silos, which are not interoperable. With blockchain-based EMRs there could be one worldwide standard always accessible.
2. New forms of insurance services can be delivered on demand, which may constantly adapt to changing individual situation. Data from quantified self-tracking wearables could be logged into a blockchain IoT (Internet of Things) surrounding and be fed into a digital health wallet with remunerative incentive programs.
3. When it comes to healthcare, related research (pharmaceutical industry), data ownership, and the secure exchange of personal data becomes crucial. Be it contributing a small number of personal data points into a large study or a large amount of individual data like gene analysis, with blockchain you can maintain control of your own data, while easily managing consent records or share benefits.

The Internet has proven to be one of the horizontal innovations from the past decades. You wouldn't want to think of a world without the Internet anymore. But the Internet (TCP/IP) was meant to be an information exchange protocol. There is no security built in. And there is no sense of trust in the World Wide Web. Blockchain, on the other hand, enables us to scale information sharing and, at the same time, to protect privacy. Blockchain is a value exchange protocol distributing trust and consensus.

Finance was the first vertical market in which blockchain took hold with Bitcoin. Because of its much broader capability base around information and value exchange, other verticals are now starting to adapt to this technology.

Healthcare remains one of the bigger challenges, as it continues to demand a larger share of GDP in most societies, specifically those with ageing populations. Healthcare affects everyone and remains a hot political topic. Meanwhile, basic healthcare is not accessible to all and, where available, outcomes vary widely. It's clear that the current healthcare models that were shaped in the middle of the last century are no longer effectively addressing the chronic care needs of today. The use of technology-driven innovations is mandatory. Healthcare has to adapt to horizontal innovations like blockchain technology to step into an era of a patient-centered environment.