One of the defining characteristics of digitization is that digital objects can be stacked endlessly, whether they be pieces of code, software programs or entire digital services. Because of this, digital products are always semi-finished and are likely to gain utility and value over time as they are combined with other products and services. This potential is most clearly visible in the emergence of sector-transcending digital ecosystems: complex networks of interoperable digital services that are able to create value by collaboratively solving consumer needs. Here, we will take a closer look at how current digital ecosystems are emerging, the hurdles they encounter along the way and what the next step might be in their evolution.

Our observations

- McKinsey expects that in 2025, of the total global economy of $190 trillion, $60 trillion will be running through these digital mega-ecosystems, replacing many current traditional industries.

- In an attempt to reconcile numerous small-scale, and mostly sectoral, initiatives to facilitate data exchange between actors, the Dutch Ministry of Economic Affairs and Climate Policy has published a proposal for a rulebook for the exchange of data between Dutch businesses (predominantly SMEs) and other stakeholders. The Ministry recognizes that sectoral initiatives are powerful in that they clearly serve the needs of current value chains (because of which stakeholders are willing to invest time and money in these initiatives). At the same time, the Ministry wants to make sure that cross-sectoral data exchange is possible as well as it believes that, in the long run, this will generate genuine innovation and the most added value.

- Some investors are already anticipating the next step towards open digital ecosystems. For instance, Outlier Ventures has presented its Convergence Stack, an investment framework which envisions a decentralized stack consisting of a collection of protocols which together enable an open, decentralized, tokenized data economy.
Connecting the dots

As a consequence of digitization, services have been able to gain substantial network effects and zero marginal cost benefits and to commodify their suppliers in the process through platform models (e.g. Uber, Airbnb, Facebook). However, with regard to value creation, these services at first mainly operated in their vertical industries with little to no interoperability among sectors, thus still reflecting old traditional value and supply chains. However, in the past decade, we have seen the proliferation of APIs, software-development kits (SDKs) and lately containerization/microservices creating standards for services to become interoperable, exchange data and open up their functionalities to third parties with the purpose to collaboratively address a customer-centric problem. Consequently, boundary-blurring digital ecosystems have emerged that consists of networks of services that are interdependent on each other’s data and value creation as each delivers partial solutions to the larger jobs-to-be-done.

Following this trend, we can expect the consolidation towards even bigger mega-ecosystems, each focusing on a different job. For example, what started out as a mere ride-hailing service will increasingly be about facilitating users going from A to B, whether by car, e-scooter, bike or a combination of these (i.e. mobility-as-a-service). This could either happen by way of an M&A strategy (e.g. Uber acquiring other modes of mobility services) or as a consequence of these different mobility services opening up their APIs to a mobility aggregator (see our note on “living maps”), so that a multimodal trip could be ordered and paid for. In a similar fashion, other B2B services could enter the value chain, ranging from insurance to in-car entertainment, fused together under the hood and possibly presenting themselves in a unified smooth user experience. We’ve already speculated how, at its most extreme, this trend could result in living-as-a-service solutions whereby different services frictionlessly daisy-chain around the daily needs of the user. McKinsey’s article “Sector without Borders” speculates on the emergence of 12 large digital ecosystems collectively responsible for one third of total global revenue in 2025.

Even though we can already see the first steps towards such a digital service landscape, the current ecosystem game is not without problems. Most players are still mostly geared towards competition instead of collaboration, in search of a winner takes all opportunity. More specifically, each vertical wants to own the orchestrating platform within the ecosystem, claiming the hub position for the purpose of rent-seeking, data aggregation and/or giving proprietary services a competitive advantage. The clearest example is the WeChat ecosystem; the super-app has been able to successfully integrate a plethora of services, enabling smooth handovers between apps in terms of data and payments. However, as WeChat acts as gatekeeper and rent-seeker, the innovative power of the ecosystem will only be as strong as WeChat’s interests allow. Moreover, the problems surrounding privacy and data ownership will exacerbate as these mega-ecosystems take shape.

In search of potential solutions, we have already explored how monopolistic silos could be broken down with the emergence of the decentralized stack, decentralized funding, open-source software and new forms of data pricing. With regard to future mega-ecosystems, these initiatives aim to diminish the role of the central orchestrator by decentralizing many of their key functions such as the exchange of data and algorithms, pricing, payments and governance. Consequently, the natural urge of ecosystem stakeholders to compete at infrastructural levels is thwarted and redirected to the application level, where one must compete based on the quality of their service offering, instead of being privileged with a gatekeeper position. Furthermore, the use of shared protocols and smart contracts, which empower this decentralized infrastructure, also provides the opportunity for stakeholders to embed rules by which services in the network should abide. As these open ecosystems allow for the possibility for all stakeholders to vote on these rules, chances will be higher that rules will be implemented that serve the collective such as GDPR-by-design, circular economy business rules or carbon taxes. Consequently, we might truly see the emergence of digital ecosystems adopting a Rhine-land model.

Implications

- At first open ecosystems will be complementary to closed ecosystems as they will offer integrated services which closed ecosystems cannot provide and vice versa. However, as scalability of open ecosystems improves and popularity builds, we could expect a gradual migration of services from closed to open ecosystems.
- In an open, decentralized ecosystem model, the lower layers of the stack will be commoditized and most value capture will take place at the edges of the network. In contrast, in a closed model, the central orchestrators will greatly profit through a rent-seeking model.
- Countries or continents that are behind on digital innovation have the benefit of not being too dependent on legacy infrastructure and might easily leapfrog to more open ecosystems. For instance, there are already more than 100 pan-African blockchain projects that have an open ecosystems approach.