Bosch Research

Economy of Things – contributions to the community

There is a fairer way – the winners and losers of digital marketplaces

Data-based platforms are playing an increasingly important role in the digital age. This is particularly true for digital marketplaces, with the companies operating them ranking among the most valuable in the world. These operators dominate their market by acting as matchmakers, pairing up consumers with producers via a function that takes into account various types of data – for example the type of request or market knowledge, i.e. knowing about specific offerings, for instance. At first glance, this might seem harmless. There is a downside, however. “Their market dominance is based on strong mechanisms that are difficult to break through, give them a monopoly, and bring considerable disadvantages for other market players,” explains Daniel Kunz, a software expert involved in the strategic advance engineering project “Economy of Things” (EoT) at Bosch Research. Kunz and the EoT team therefore advocate an approach that is based on decentralized technologies and cooperation between market players and paves the way for a fair and open digital economy – independent of a single, dominant force.

Why exactly are matchmakers so powerful?

The success of digital marketplaces lies in what is known as network effects. “Where different users are part of the same network, the quality of the network is determined by how much the users interact with one another,” explains business analyst Tobias Kölbel from the EoT team, adding: “The more customers a platform has, the more valuable it becomes for other customers.” The more individuals who shop online on a platform, the more interested businesses will be in selling their goods on it. But this logic works the other way round, too. The more traders there are, the more interesting the platform becomes for the individual shoppers. In short, supply and demand feed each other.

When it comes to digital marketplaces, what matters is therefore how big the networks are – and not so much what additional functions the platform offers. Powerful network effects ensure platform operators reach a critical mass and can thus scale up their business at a rapid pace. Bit by bit, their platform consequently becomes the go-to option. Yet this dominance over the market leads to an economic imbalance, with the strong becoming ever stronger and the weak ever weaker. Dominant platforms with monopoly positions, a situation also known as a winner-takes-all market, are the result. “It goes without saying that this is a positive development for large-scale platforms. For smaller providers, however, this can quickly end in a downward spiral. At first, it’s impossible to tell which platform will come out on top. To begin with, multiple platforms can exist alongside each other. But sooner or later, as the number of interactions increases, one platform will prevail,” explains Kölbel. From the user’s point of view, this results in what is referred to as the ‘lock-in effect’. This is where users are tied to the dominant provider – even if an alternative provider potentially offers better products. On the one hand, switching providers would be too expensive, for example due to access costs, registration fees, or simply because of the time it would take to come to grips with a new system. On the other hand, the competing platform is less appealing because of the lower number of users, with fewer interactions meaning fewer opportunities on offer.

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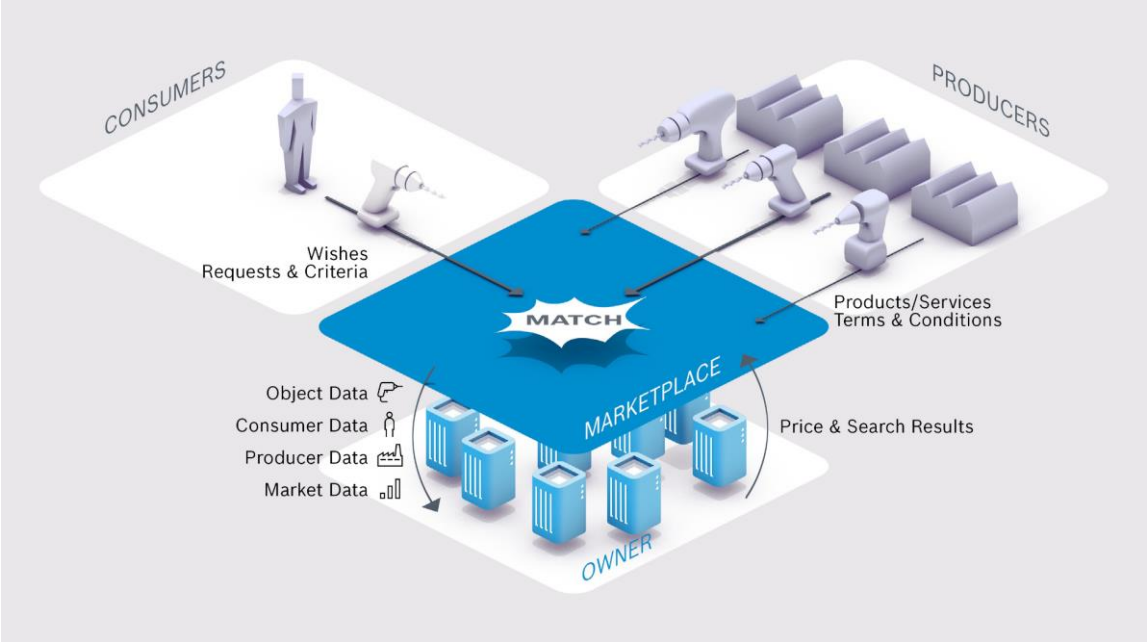

Platform operators pair up customers and producers on digital marketplaces. This matchmaking depends on various types of data – including the type of request and market knowledge, i.e. knowing about specific offerings, for instance.

The power of knowledge

As long as users have an easy time of it and get everything they need on one platform, you might be tempted to think this is all good. Yet there is a flip side to concentrating power in the hands of one market player, as Kölbel suggests: “Although the platform offers every user added value, it’s the platform operator who benefits this most. Thanks to their monopoly position, they achieve high margins and rapid growth.” Many of the most successful digital marketplaces are administered and run by a single legal entity. “In other words, a single organization has access to all data from transaction processes. This organization collects data about its customers and thus possesses a very accurate understanding of the market situation.” By collecting, analyzing, and combining this data, platform operators can build up vast knowledge of their customer groups – buyers just as much as sellers. This accumulated knowledge gives them a considerable advantage over the competition – and they can use this information to make an even greater profit. For example, they could identify interesting products, manufacture them themselves, sell them at a more attractive price, and ensure they appear among the top search results. Producers using the platform to sell their goods can do very little to stop this from happening. Either they accept the platform operator’s conditions – a hefty cut of sales or even stipulations about the product itself – or they are denied access to the consumers who use the platform.

Speaking of consumers, it’s important to point out that they can be misled too. “Marketplace operators could use the information they collect to personalize prices. In other words, different prices can be shown for different customer types because the platforms collect all sorts of transaction data, including data pertaining to the user. This gives rise to an imbalance in terms of information. Customers think they are seeing the real market price, but that’s not actually the case,” says Kölbel. As far at the Bosch EoT team is concerned, this is anything but a fair, balanced economy. “The intermediary role played by matchmakers is vital for successful marketplaces. However, we believe that this coordination role needs to be combined

with alliances. One option could be for different partners to run a collaborative, decentralized system – for example in the form of a consortium encompassing multiple businesses or a community – that nevertheless focuses on bringing together supply and demand," Kölbel says.

Collaboration and competition are not mutually exclusive

According to Daniel Kunz, collaboration is the key to a fair system: "Different companies could collaborate and combine their resources to develop and run the technical system or platform, without a single one of them controlling the network. At the same time, they would still compete with one another at product and service level." Kunz is convinced this would both create an ecosystem that offers added value for all participants and make it possible to prevent individual companies from establishing monopolies, as is the case in the platform economy today. Although certain services could still come out on top on decentralized platforms, Kunz believes "the decentralized access to the data and matchmaking function ensures there are always alternatives." This concept could also be applied to the Economy of Things, in which devices are connected to each other and transaction processes are expected to run autonomously in the future. "EoT can be based on a decentralized infrastructure that enables every company to pick and choose what information they want to share with a business partner. In contrast to centralized structures – in which power, control, and trust are consolidated as much as possible – a decentralized concept shares out the responsibilities among the community. Imbalances of power and information can be avoided, unlike in centralized structures. Instead of having a single participant wielding a disproportionately large amount of power, the entire system would benefit from the network effects of a decentralized platform." According to Kunz, this would be based on an organizational structure that would need to be safeguarded by trustworthy governance and, from a technological point of view, open standards for a decentralized network. "Viable technologies in this context could include blockchain as a distributed ledger technology (DLT). Other decentralized concepts such as multi-party computation (MPC) and cryptographic protocols such as zero-knowledge proofs are also conceivable," he says. Rather than having a central authority with insight into and control over all data streams, these technologies allow the individual platform participants to manage their information themselves. This gives rise to transparent, verifiable, and consensus-based interactions between multiple participants in a cooperative ecosystem.

Read more about digital marketplaces and how they work in the research paper written by Daniel Kunz and Tobias Kölbel.

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