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Abstract

In management, as in other fields, new technologies sometimes force us to reconsider the conclusions of our long-accepted theoretical models. This is the case with digital platforms such as Uber and Airbnb: these kinds of structures have been theorised since at least the 1980s with Coase and Williamson's work on transaction costs, but applying them seemed impossible given the challenge of building trust between strangers, as studied by Akerlof. However, a series of technological breakthroughs has overturned these theoretical conclusions. By drastically reducing transaction costs, communication and transportation technologies have changed our perceptions of companies' frontiers. Other technologies, including generative AI, may require us to reconsider the conclusions of other models that have arisen from research.

Keywords: theories, models, technologies, transaction costs, generative AI

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As early as the early 1990s, some fifteen years before Airbnb (2008) and Uber (2009) were founded, researchers were theorising the arrival of digital platforms that could connect independent service providers with end customers (Fréry, 1994). However, this hypothesis came up against a practical impossibility: transaction cost theory had shown that these digital platforms were inherently less efficient than integrated companies with their own assets and employees. Digital platforms were therefore seen as a curious possibility, but certainly not as an organisational reality.

However, this conclusion, widely shared by researchers at the time, was challenged in the 2000s and 2010s by the spread of a series of technologies, so much so that by 2023, almost 30 million people in Europe will be working at least in part for digital platforms in hospitality, ride sharing, meal delivery, grocery delivery and more.

We can learn a great deal from these upended conclusions of an established theory since other management models may one day suffer the same fate at the hands of other technologies.

Transaction cost theory

Transaction cost theory came about from the intuitions of Ronald Coase (1937), extensively elaborated by Oliver Williamson in his work (1975), earning both of them the Nobel Prize in Economics in 1991 and 2009, respectively. In its most orthodox version, this theory answers the fundamental question, "why are there companies instead of an atomised market?". It explains the existence of integrated companies by the fact that market participation entails specific costs, called transaction costs, which generally fall into four types:

1. Differentiation costs: the market is inefficient if it needs to differentiate how it compensates multiple, related contributions. For example, a public transport company typically sets flat-rate fares instead of calculating the fare for each user based on the time, duration and distance of travel, which would be too costly.
2. Information costs: to operate in an atomised market, a micro-firm must identify its potential partners and be identified by them, which implies significant information costs in advertising, research and prospection costs, etc.
3. Risk coverage costs: participating in the market involves a series of risks, notably those related to opportunism from competing players (legal fees) and the unpredictability of economic trends, such as exchange rate swings and supply disruptions.
4. Bounded rationality costs: Simon (Simon, 1945) has widely demonstrated that the hypothesis of individuals' absolute rationality, on which an optimally functioning market relies, cannot be accepted. In fact, bounded rationality implies a sub-optimization cost.

Integrated companies are legitimate because they can reduce these various transaction costs, or at least deal with them globally. Within an integrated company, compensation is calculated according to predetermined scales, information costs are those of the firm's internal information system, risk coverage is less costly thanks to tools such as standardised contracts and financial compensation mechanisms, and the organisation helps to overcome individuals' bounded rationality in ways such as increased information gathering

and processing capacity and narrower scopes of individuals' attention through the division of labour, procedures' role as decision aids.

However, integration also leads to another category of costs, coordination costs, caused by setting and monitoring standards, compensating managers, designing organisational structures, and so on. Consequently, to determine whether it is better to integrate a link in the value chain (at full cost C_i) or to outsource it to an external player (at billing price P_e), we need to take into account internal coordination costs C_c and external transaction costs C_t . To determine whether it is better to do something internally rather than have someone else do it, we need to compare $C_i + C_c$ (internal) and $P_e + C_t$ (external). This comparison clearly favours integration, which explained the rise of large companies.

There is another aspect to this. According to George Akerlof's work (1970), which also won a Nobel Prize in Economics in 2001, replacing integrated companies with one-off transactions between independent service providers and individual customers poses a fundamental problem of trust. Taking used car sales between private individuals as an example, Akerlof shows that one-off transactions, between individuals who don't know each other and in which information asymmetry can be significant, cause mutual distrust that encourages cheating on both sides. Unable to trust their suppliers or customers, people tend to protect themselves from deception by being opportunistic themselves.

All in all, with their mistrust and unfavourable transaction costs, digital platforms were reduced to a mere theoretical curiosity: not only would no one agree to welcome strangers into their home or to be driven around by a driver with no recognised qualifications, but these approaches were also structurally less efficient than using integrated companies. These platforms seemed to have no future. However, everything changed profoundly in the 2000s thanks to developments in technology.

Technologies upend the theory

Whilst it was perfectly legitimate to invoke the transaction cost approach to explain the existence of integrated companies when Coase developed his theory in 1937, this reasoning was already less relevant when Williamson took it up in 1975, and today it has all but lost its credibility. In the meantime, a succession of technological advances has led to a drastic reduction in most transaction costs. Shipping containers, the Internet, the growth of the Web, smartphones and now social networks have profoundly changed the landscape. It has become quite inexpensive to coordinate independent service providers, locate individual customers and set up digital platforms that easily connect the former with the latter.

Conversely, coordination costs have tended to increase. The number of managers has increased dramatically, structures have become more complex, and compliance procedures such as ISO and Six Sigma have become increasingly cumbersome and costly, to such an extent that many companies have implemented management control mechanisms based on internal transfer prices, essentially bringing a market philosophy into the organisation.

All in all, we can reverse the same arguments that led to a preference for market-integrated companies, thanks in part to technological progress. In a growing number of sectors, such as clothing, IT, automobiles, publishing and audiovisual media, the transaction cost approach now favours the market. This reversal, which went from being a mere theoretical hypothesis in the 1990s to a practical reality just a decade later, is what explained the rise of digital platforms such as Airbnb and Uber.

Meanwhile, we have to recognise the impact of eBay, which was the first player to ask its users, both buyers and sellers, to use stars to rate each other. This simple idea, applied on a massive scale through the spread of the Web and smartphones and then extended to almost all digital platforms, circumvented Akerlof's conclusion about the opportunism of transactions between strangers when there is an asymmetry of information. As Frédéric Mazzella, co-founder of carpooling platform BlaBlaCar, rightly summed it up, "*BlaBlaCar is hitchhiking with trust*". Without smartphones and mutual evaluation, trust between strangers could never have been established, and these business models could never have existed.

In sum, a series of technological developments, by drastically reducing transaction costs and allowing trust to be established between strangers, has overturned the conclusions of a theory that was used to explain the existence of integrated companies for almost a century. Smartphones have overturned the conclusions of three Nobel Prize winners in economics.

The influence of generative AI on other theories

Just as transaction cost theory has been radically disrupted by the massive spread of the Internet and smartphones, other established models could also see their conclusions upended by technological developments. These include generative artificial intelligences, such as ChatGPT, Bard, Bloom and Copilot. Three consequences could happen:

- Generative AI could allow everyone to break free from the bounded rationality highlighted by the work of Herbert Simon (1957), for which he was awarded the Nobel Prize in Economics in 1978. Thanks to this technology, the mythical *homo economicus* of economic science, capable of making decisions to optimise its utility in all circumstances, could become a reality. This could call into question a large part of behavioural finance and economics (Thaler, 2015), while breathing new life into classical models. Generative AI is likely to help every investor, customer and manager to consistently make the most optimal decisions, not just in theory, but in practice. If this is the case, a whole field of contemporary research will be turned upside down.
- Conversely, by the very nature of how they work (generating the most likely text in a given context from a pre-established corpus), generative AIs could reflect and amplify bounded rationality, therefore providing a much better understanding of the limits of human rationality. This could make finance and behavioural economics even more attractive, as well as the study of consumer behaviour in marketing and individual and collective decision-making in management.
- We could even see generative AI as a good analogy for how human thought works. Certain works in psychology and sociology, such as those by Karl Weick (1995) and the numerous research works into cognitive biases, suggest that human thought often follows an automatic, pre-conditioned path. Just like ChatGPT, we also tend to finish our sentences with the words that seem the most likely depending on the context. This is the very substance of all literary stereotypes (Laroche, 2022). Thus, generative AI could help us to better understand how human intelligence works, which would obviously influence a number of established research works in management.

Nothing currently allows us to predict the impact these technologies will have on management models, but it is likely that it will be significant. This re-reading of old theories in light of new tools reminds us that models are only valid in relation to a certain state of knowledge, and that their falsifiability, to use Karl Popper's terminology (1934), is precisely

what characterises their scientific nature. As biologist Jean Rostand mischievously put it: "Theories come and go, frogs stay."

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