

# Position Paper: Economics of Data Sharing

STUDY ON THE EMERGENCE AND CREATION OF VALUE WITHIN  
DATA-SHARING ECOSYSTEMS

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## INTRODUCTION

The aim of this paper is to set out the analytical position adopted for a study of data spaces as part of a collaboration between Paris Dauphine University and the Gaia-X Institute. It provides a first draft of a data space model following on the study carried out in 2023<sup>1</sup>, in the context of new European regulations (Data Act, Data Governance Act). This position paper thus provides a framework for a documented analysis of data ecosystems, and this analysis will be used to test the robustness of this framework, as well as to refine it. This research proposal will then have to be fed with empirical elements (data, interviews), in order to allow a quantitative evaluation of the proposed theoretical framework.

The aim of this study is to gain a better understanding of data sharing ecosystems on two levels: that of participants, and that of data ecosystem orchestrator (which can be an intermediary or not).

This dyadic approach provides a holistic view of data ecosystems. We will analyze;

- The value that participants extract from the data space. What interests and benefits they can derive from their participation in the ecosystem.
- The role of data orchestrators both as drivers of emergence of a data sharing ecosystem, and as service providers to stakeholders once the ecosystem is operating.

As a result, we will analyze, on the one hand, the participants in the dataspace (which are usually both users and providers of data and related services), and, on the other hand, the orchestrators, who are organizing the ecosystem. Data ecosystems bring together a range of stakeholders wishing to exchange data and complementary services. These ecosystems are considered as “clubs”, since to be viable they must enable participants to extract benefits from their contribution to the common pool of resources (i.e. shared data and derived services). We will also look at the diversity of orchestrators’ business models : from pure technical facilitators to commercially integrated agents, depending on the organization of the value chains they address. Indeed, the ecosystem orchestrator might simply provide technical services (standards, provision of a platform, user/supplier catalog) or a set of commercial services (value-added services, sale of enriched data, etc.).

### I. Benefits for ecosystem participants: A gradual approach

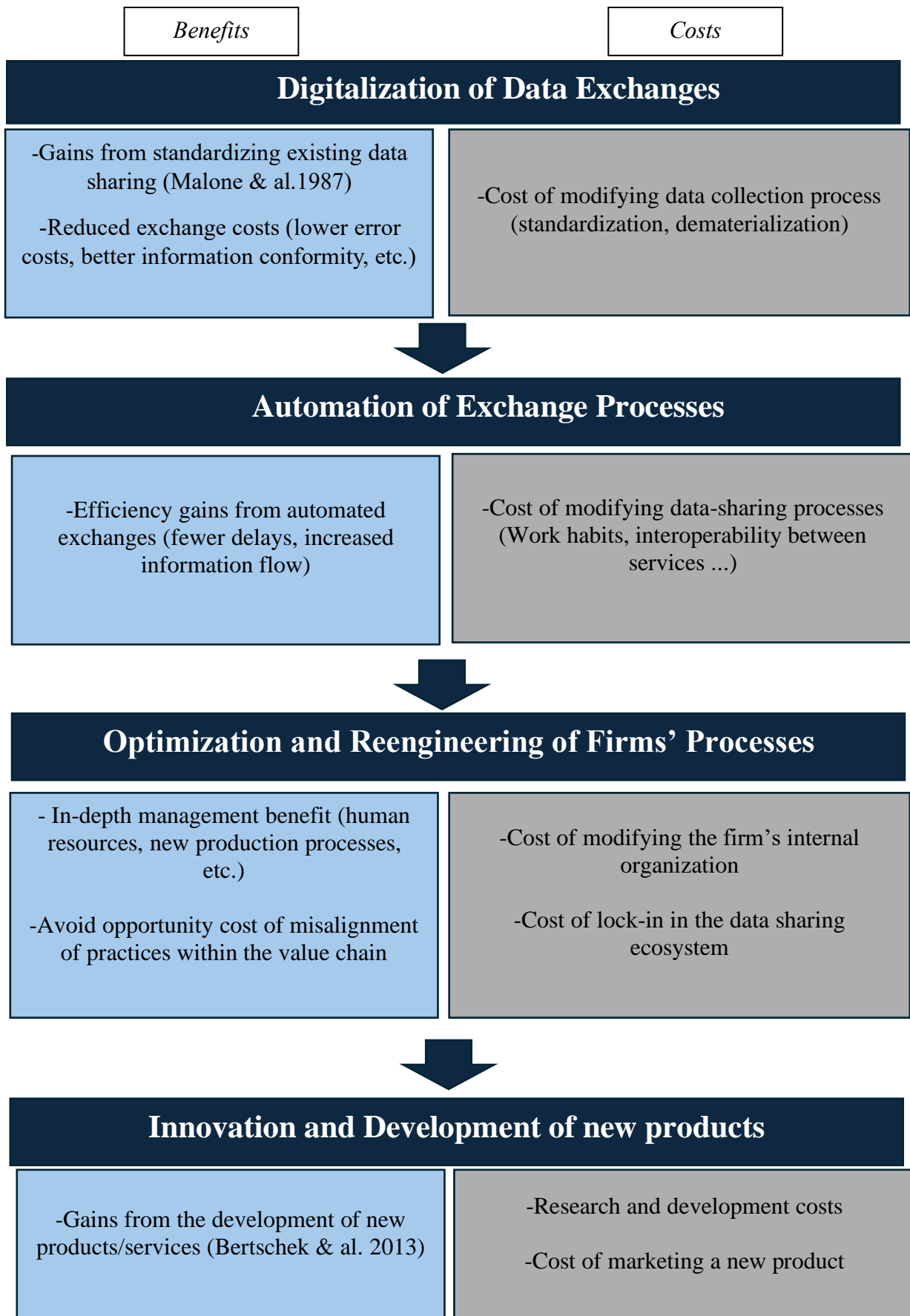
One way of organizing data sharing, especially in the B2B market, is through data ecosystems. These data ecosystems constitute a spectrum of "clubs". A club allows to provides goods that are non-rivalrous (i.e. goods which consumption by one agent does not prevent use by other agents) but which are excludable (i.e. goods which access to can be technically and economically efficiently prevented). Indeed, when access cannot be prevented, no one has incentives to contribute to the provision of the good. The creation of a club, which purpose is to discriminate between members and non-members, allows to avoid the “free rider” problem by restricting access to benefit derived from the good to closed group of participants who

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<sup>1</sup> Presentation available here: <https://chairgovreg.fondation-dauphine.fr/en/ressources/1603/replay-data-sharing-europe-dga-and-da-legal-consensus-achievement-implementation>

contribute to the production of the good (Sandler & Tschirhart 1997). The services provided by the orchestrator together with the shared data and the service derived from them and benefitting to the ecosystem's members constitute the "club good" provided to the stakeholders of the data-sharing community. The club owes its existence to the willingness of its members to participate. Each participant must therefore contribute (financially, and through the supply of data, and of value-added services) to benefit from the service. The organization of the club establish its ability to emerge and its sustainability, given the economic characteristics of the value chain in which it is implemented.

Participants will be encouraged to join an ecosystem, and thus contribute to it, if they derive benefits from it. There are several levels of benefits, from the most direct and tangible for participants to the most prospective. It is important to note that these benefits can be approached sequentially, at distinct stages of an ecosystem's maturity. A recent data ecosystem should focus more on the first direct levels of gain, to reach the critical mass of participants. Later, when both the ecosystem and the participants have developed a sufficient level of data-sharing maturity, they may discover less direct, while potentially more significant benefit. However, these benefits do not come on their own; they are associated with costs. For the benefits are acquired through greater integration of the stakeholders into the ecosystem, and this integration requires changes in production processes, as well as in the firms' organization. The benefits and costs are presented in the following figure:



*Figure 1 Representation of ecosystem participants' benefits*

This perspective highlights two important points for the dynamic of data sharing ecosystem:

- The first level of benefits relates to cost savings and constitutes a direct and identifiable gain for all parties. Gains in innovation and new product development are unlikely to drive the emergence of a data-sharing ecosystem.
- The highest levels of value added request the costly integration and the reorganization of the value chain.

This framework to analyse and benefits will enable us to classify ecosystem use cases to better understand how participants create value, which will also help us to refine the typology.

This ability to extract benefits depends in part on the structure of the ecosystem. In other words, the interaction between the structure of the value chains in which the participants are involved, and the characteristics of the agent in charge of orchestrating the ecosystem.

## II. Governance and business model of data intermediaries : A dynamic perspective

Data ecosystems are not uniform and may rely on various business and governance models. These ecosystems can be built on an already highly organized value chain with the presence of a key player who will play the role of ecosystem orchestrator. But they can also be less organized value chains without the a key player able to build and coordinate the whole ecosystem resulting in the need for an intermediary to carry out the emergence and performance of the ecosystem. This heterogeneity stems from the characteristics of the various values chains. The aim of this section is to understand the relationship between value chain structure and ecosystem orchestrator (Belavina & Girotra 2012 and Brousseau & Glachant 2023), and which business model is best suited to a given type of organization. Ecosystems orchestrators can be represented in two dimensions that reflect the characteristics of the value chain:

- One sided or multi-sided orchestrator: The ecosystem is one sided when the orchestrator facilitate communication between the participant who form one distinctive group which exhibit same-side network effects (within their value chain) and have interchangeable roles (Staykova & Damsgaard 2014). Meaning if the need is the same and is identified by all the players, then the orchestrator will only be a technical intermediary, dealing one by one with each player in the value chain, with the latter not needing any commercial intervention from the orchestrator to conduct the data exchanges. For example, this could be the case of a value chain that encounters a common problem of product traceability. Once the need has been identified by all participants, orchestration provides only technical tools for each participant. However, if needs are more diverse and less aligned, then the orchestrator will need to be more commercially integrated to facilitate exchanges. By providing cross-subsidies to parties with the least incentive to share data from those with the most incentive. This may be the case for a problem encountered by one part of the value chain, which needs data from another part, the latter having little or no incentive to resolve the former's need. It is important to consider

the dynamic aspect of this dimension, where an ecosystem may initially be single sided before evolving, through the integration of new participants and new value chains, and diversification of the uses cases towards a multi-sided ecosystem.

- **Atomicity of the ecosystem:** This dimension highlights the presence of a key players who can orchestrate the ecosystem within the value chain. A key player is a firm in a position of strong market power in at least one segment of the value chain, such that it is essential for the other players in the chain. The presence of a key player will influence the ability of an ecosystem to emerge. However, while making the emergence of an ecosystem easier, a key player can also pose a problem, particularly when it comes to sharing value. The key actor's dominant position enables it to benefit from its market power to capture the value created by the ecosystem to mainly its advantage, which can disincentivize participants to join the ecosystem. In some cases, the ecosystem may be founded in opposition to this key actor, to enable other stakeholders in the value chain to reduce its abuse of market power. In its absence or if participants are unwilling to take the risk inherent in its dominant position, they will have difficulties to coordinate at the emergence state. These two continuous dimensions form a matrix that will help us address several dimension of interest. In particular, the issue of spontaneity. The emergence of data spaces and the value added by the orchestrator within the ecosystem (i.e., just technical facilitators serving to reduce transaction costs, or stakeholders offering value-added services, etc.).

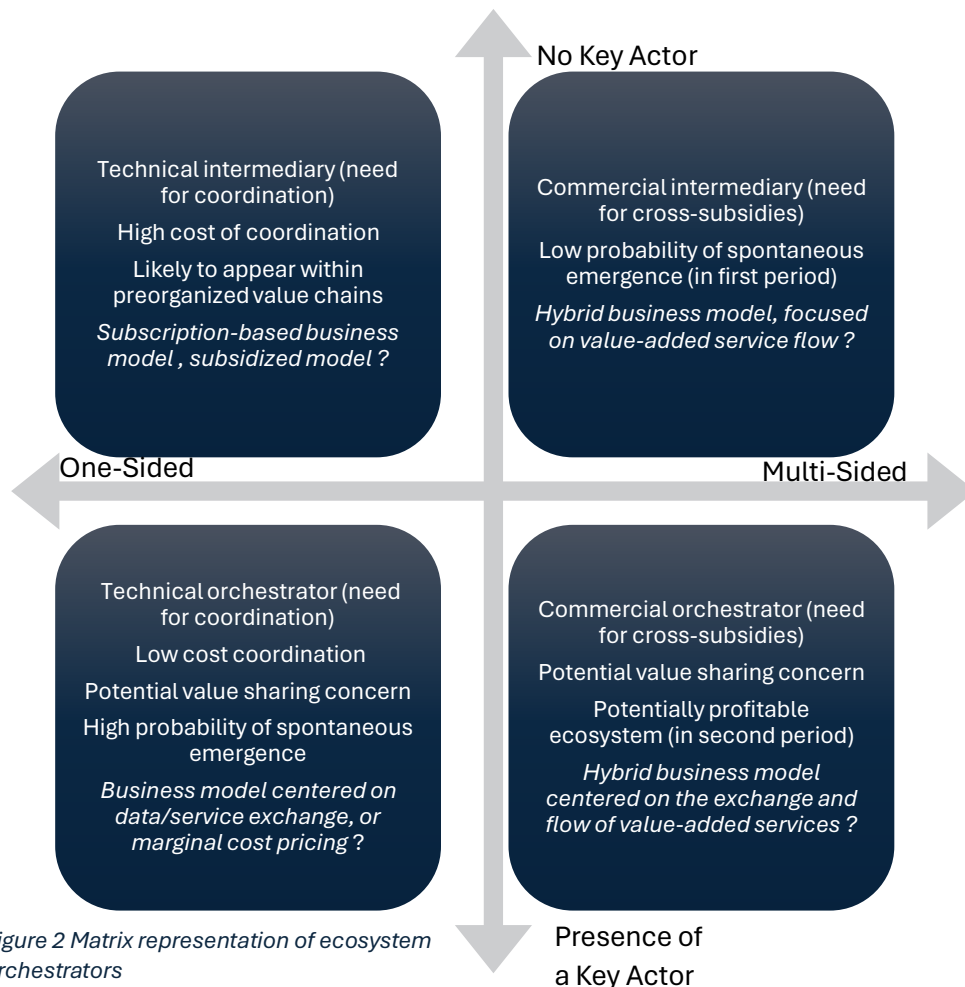


Figure 2 Matrix representation of ecosystem orchestrators

The resulting matrix enables us to study the characteristics of value chains and their participants. Certain elements are obvious from the dimensions used, for example, the need or cost of coordination. Others correspond to hypotheses that need to be confronted with existing ecosystems, notably the question of the orchestrators' business model.

This matrix should also enable us to understand the dynamic evolution of data spaces. For example, to understand the effect on the organization of the data ecosystem and the orchestrator's business model when the ecosystem moves from single-sided to multi-sided. Moreover, by testing this framework it will allow us to understand the interaction between the emergence of an ecosystem, its viability, and the type of use cases they deploy (and therefore the benefits extracted by participants). This will enable us to recognize patterns of viability (according to use cases) for ecosystems at different stages of development.

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