



Datanomics

Series #3

MAKE-OR-BUY CHOICES

FOR DATA AND ANALYTICS

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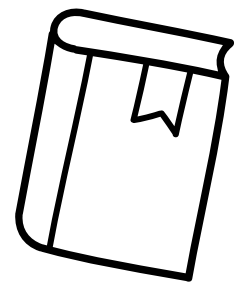
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Data value chain

Why value chain matters

There are two main arguments for explaining why make-or-buy decisions regarding the data value chain are important:

- 1 Data assets and capabilities redefine market boundaries and competition dynamics.** Technology companies are challenging non-digital companies with a value proposition based on analytics (IBM is a good example of that). Platforms challenge incumbents with usage-based value proposition (Uber and Airbnb are good examples).
- 2 Data and analytics are a significant value creation driver.** Costs can be reduced, revenues increased, as margins.

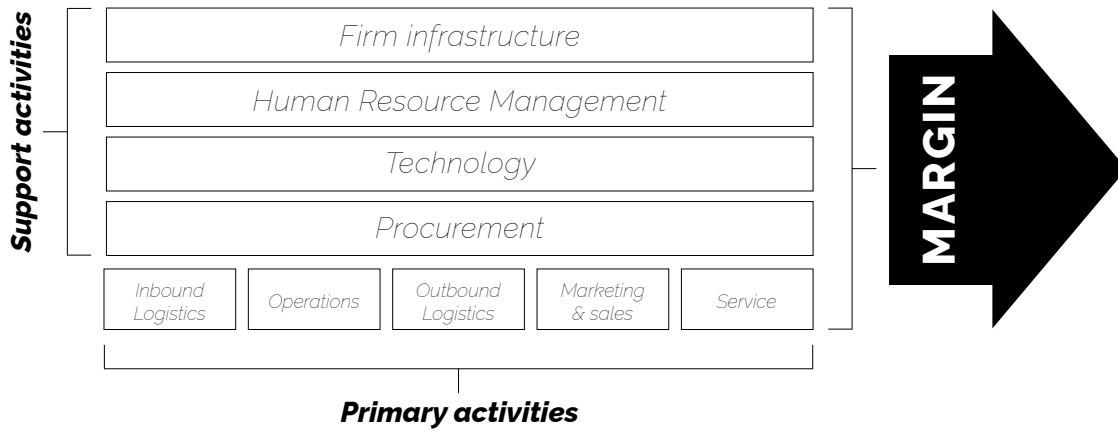
So the question is for all non-data natives companies to decide on their positioning in the data value chain: which activities are key, which should be mastered internally, what to outsource? which partnerships to forge? Depending on how they answer these questions companies have a higher or lower ability to leverage data assets and capabilities for value creation.

Several factors come into play:

- **The incentive to leverage data and analytics assets is higher:** incumbents are being aggressively challenged by digital players and one key resource in this new battle is data.
- **The time of experiments and proof of concepts ended:** in many industries, incumbents are redefining their physical-digital balance and the experience of the last 5-10 years helped them to define a position and a strategy regarding their digital capabilities. COVID 19 has accelerated this shift for many companies. **McKinsey study** reports that the adoption of digital services has increased as much in 6 months that it would have in 7 years.
- **The market for solutions is now well structured:** thanks to progress in research and teaching, investors poured a significant amount of money in AI startups in the last 5 years. Now the market for AI solutions is flourishing. Similarly, the Tech giants have scaled up their capabilities.

Value chain is an essential concept in strategy, described by Porter at the beginning of the 1980's. The value chain describes the categories of activities within an organisation to create a product or a service. It is used to model the value generation of an organisation and its competitive advantage.

« Strategy is the creation of a unique and valuable position, involving a different set of activities. The essence of strategy is to choose activities that are different from rivals » (Porter, 1996)



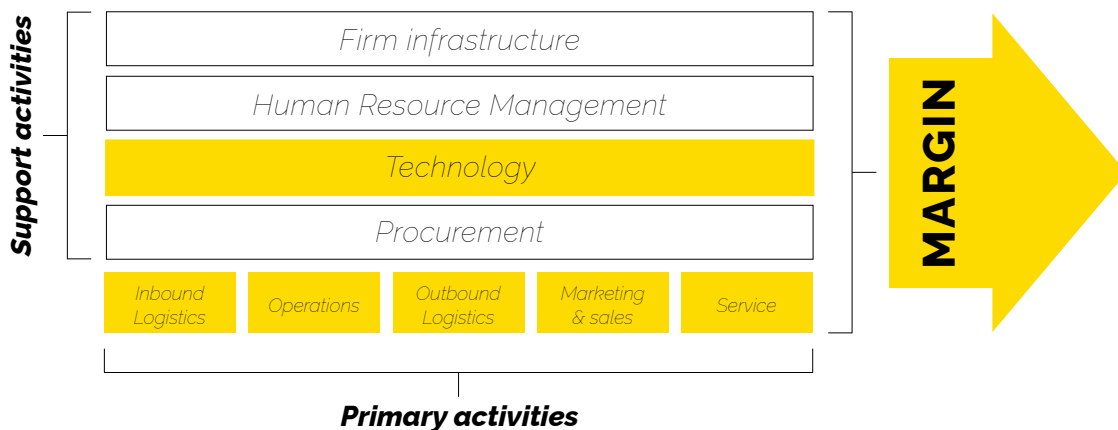
The value chain of a company is its recipe for value creation:

- What are the key activities to realise to perform in one market
- Which activities are done internally and which are outsourced
- In which activities the company performs better than its competitors

Data value chain

The connection between data assets and capabilities and the value chain is twofold:

- Directly as a support activity ("Technology")
- Indirectly as they have an influence on how the primary activities are realised and their performance



We can split the data value chain into 4 components:

- **Generation:** activities and assets necessary to capture and record data (structured, semi-structured and unstructured). E.g.: Web applications, ERP, IoT and connected devices, Social media, ...
- **Collection:** activities and assets to collect, validate and store data. E.g.: stream, cleansing, reduction, integration, storage infrastructure and models, security, ...
- **Analysis:** activities and assets to analyse and generate insights. E.g.: Semantic analysis, models (Predictive, Descriptive, Prescriptive), visualisation (graph, maps, 3D, ...), ...
- **Exchange:** activities to expose outputs internally and externally. E.g.: decision making, trading

Key resources and capabilities for value creation

It's a matter of data assets and capabilities

Quite evidently if a company wants to use data as leverage for value creation, it needs to master data assets and capabilities:

- **Tangible assets:** data, technology, infrastructure
- **Human assets:** technical skills, managerial skills, domain expertise, relational knowledge
- **Intangible assets:** data-driven culture, organizational learning
- **Data collection capabilities:** text mining, web mining, social networks analysis
- **Analytical capabilities:** statistics, optimisation, modelling, machine learning
- **Interpretation capabilities:** data visualisation
- **Predictive analytics capabilities:** forecasting, simulation

These are the necessary assets and capabilities. You cannot mass-customize your marketing messages unless you have a dataset on the past behaviour of your customer and prospects and an infrastructure to analyse it in near-real-time and talents to fine-tune recommendation algorithms.

It's a matter of IT and design capabilities

Data assets and capabilities are necessary but not sufficient, other IT and design capabilities are necessary. Recent research showed that data assets are associated with an average of 3%–7% improvement in firm productivity. Yet differences in returns are substantial when the industry is considered. In IT-intensive industries, the average productivity gain is 6.7% productivity gains (vs 0 for other firms). Which means that data solutions require complementary IT assets and capabilities (transactional enterprise systems, data scientists, ...) which can provide the necessary data and skills to extract knowledge out of this data.

On a different note, a lot of the value creation associated with data assets is related to web services and applications for customers: customized content, online services, usage-based service, ... The value is captured only if the customers massively adopt these services. In that matter, design capabilities (UX and UI) are key to trigger massive adoption. If a company has the perfect dataset, the good infrastructure and talented analysts but fails at designing an attractive application for its customers, the value is not captured. This is partly why it has been so difficult for manufacturing companies to thrive in the Internet of Things environment, they lacked the design capabilities to produce an attractive solution to their customers.

It's a matter of ability to respond to the signal

To illustrate this in a previous report, I used the example of a bank. They had a problem with churn, so they implemented a data-driven approach to predict which of their current clients would churn in the short term. The model worked pretty well, but the problem was not to know they will churn, the problem is to have the good services to keep them.

Data-driven insight is only a component of a firm's ability to sense, seize and reconfigure, the organization must be designed to be able to respond to changes that insight indicate. Big data generated insight is only one component of gaining value from big data investments, the other is responsiveness.

Conclusion

- Big data resources and capabilities are a necessary component to master but are not sufficient for capturing the value (other IT components, design, community and ability to respond are key)
- According to which service is offered, various stacks may be required (threshold capabilities)
- There is little use building a robust technical stack without building a strong operational capability

Make / buy / source / partner, 4 options for accessing the key capabilities

A few years ago, Porter wrote a very interesting article about how IoT (How smart, connected products are transforming competition). Of course, a lot of it has to do with data and make-or-buy decisions.

Among the 10 strategic questions identified by Porter, 5 directly relate to make-or-buy decisions

- Should the company pursue an open or closed system?
- Should the company develop the full set of capabilities or outsource?
- What data must the company capture, secure and analyse to maximize the value of its offering?
- Should the company fully or partially disintermediate distribution channels or service networks?
- Should the company enter new businesses by monetizing its product data through selling it to outside parties?

If we apply these questions to our previous framework, it means that for each component of the data value chain the company has 4 choices:

- **Make:** realise the activity with internal resources and capabilities
- **Source:** purchase on the market products or services available
- **Buy:** acquire a company realising the activities
- **Partner:** forge an alliance with another company to share resources



Which choice for each value chain component ?



Make



Buy



Source



Partner

The usual framework for deciding on one of the 4 option blends several dimensions:

- **Opportunity.** For example, is there a market for sourcing?
- **Cost.** The direct costs of the solution and indirect costs, for example, the opportunity cost in case you develop it internally
- **Risk.** The technological risk associated with one solution.
- **Customization.** Is the solution tailor-made or designed for a wide range of usages?
- **Dependence.** How reversible the decision is?

Market trends to take into consideration

Analysing the market is necessary, in particular, to assess the level of opportunity associated with *Source* and *Buy* options. I will not enter here in a detailed market study but will focus on 4 insights **excerpted from an analysis by a VC firm in 2019.**

- **Infrastructure:** from Hadoop to the cloud services to a hybrid environment (to balance the cost of cloud services and lock-in). This increases complexity (compatibility + tracing data)
- **Analytics:** consolidation (eg: acquisition of Tableau by Salesforce) and democratization of M/L usage in corporation supported by commoditized products (Dataiku)
- **Applications:** burgeoning of AI solutions to tackle specific use cases
- **Cloud service companies** are extending their scope to AI/ML solutions (internal development + mergers) to increase revenue and lock-in

Comparison of the 4 options

Let's now rapidly compare the 4 options.

Make (Use internal human and technical resources)

Main advantages: Full customization + Total control of the value capture

Limits: Do not benefit from scale effect + Do not leverage external expertise + Requires high internal expertise

Examples:

- Banks for their market activities, [example here with Goldman Sachs](#).
- Walmart. [Interview here with the AI lead by MIT](#).

Source (Buy on the market, off-the-shelves product and services)

Main advantages: Benefit from scale effect + Benefit from external expertise

Limits: Lower customization + Lock-in and dependence + Low capitalisation of expertise

Examples: [see the market mapping here](#).

Buy (Acquire a company and its stack of resources and capabilities)

Main advantages: Time to delivery + Benefit from external expertise + Control of the value capture

Limits: Integration execution risk + Cost ?

Examples:

- [BMW, Audi and Daimler's HERE purchase is about more than maps](#)
- [McDonald's Bites on Big Data With \\$300 Million Acquisition](#)
- [L'Oréal buys beauty tech Modiface](#)

Partner (Agree with another company to leverage together individual resources and capabilities)

Main advantages: Flexible over time + Lower risk (shared costs)

Limits: Medium-term alignment of interests + Value sharing between partners + Limited customization

Examples:

- [Google and Renault partnership](#)
- [GlaxoSmithKline and 23andMe](#)
- [Airbus and Palantir on Skywise platform](#)

Conclusions on the choice between the 4 options

The choice remains highly context dependent. According to the strategy pursued, the level of resources available or the actions of direct competitors, the choice between the 4 options would differ.

However, I stress here 3 main conclusions:

- 1 Data capture is the most distinctive part of the value chain.** Of course, some difference can be made at other parts but the ability to gather a rare and difficult to copy dataset plays a huge role in creating a high-value positioning.
- 2 Capabilities on the collection and analysis parts are now numerous on the market.** It means more opportunities for source or buy options as it reduces the differentiation. Make options are preferred when the use case requires high domain-specific knowledge.
- 3 To achieve major performance improvements, some acquisitions target to acquire also «non-data» capabilities.** As we described previously, tech-related resources and capabilities are necessary but not sufficient, design and community management are also necessary. Acquisitions are sometimes used to acquire these capabilities.

Building a distinctive value chain

Competition layers are more numerous than they used to be. For example, Siemens competes not only with their traditional direct competitors but also with tech companies and integrators.

In this battle, each company leverages its own capabilities to build a distinctive positioning which is reflected in their make-or-buy decisions.

Make-or-buy decisions differ between tech companies and incumbents. Tech companies enter the market leveraging capabilities the incumbents do not master (service design, community building, platform architecture and management, ...). When it comes to the data and analytics value chain, the choices differ particularly at two parts of the data value chain: collection (activities and assets to collect, validate and store data) and analysis (activities and assets to analyse and generate insights). To have an edge against incumbents, tech companies are more likely to use a make approach whereas, for resource efficiency, incumbents are more likely either to source off-the-shelves services or to buy companies that developed a domain-specific solution.

Make-or-buy decisions differ also between direct competitors, for different reasons. An interesting example to illustrate this is how BMW and Renault made opposite decisions. Both companies faced the same challenge, i.e. accessing navigation and map data. BMW partnered with Daimler and Audi to buy Here, a company that developed a navigation and map solution. Buying the company has a clear advantage: develop a proprietary solution to escape from the dependence on Google. It's interesting to note that Renault did exactly the opposite, namely entering into a global partnership with Google to use their services in Renault cars. It's probably too early to tell which strategy will pay off better but it's clear that these decisions reveal the strategies of the two companies: BMW aiming to strengthen its position in the high-end market with proprietary solutions and service extension; Renault concentrating on the middle range market and using all its resources to leverage its manufacturing capabilities. Of course, Renault's choice comes at a price: sharing value with a partner and being exposed to dependence risks.

As we saw, the choices are highly context-dependent and no general rule can be formulated for make-or-buy decisions.

Four elements to take into consideration when deciding:

- **The strategy of the company is the main driver for decisions on the data value chain.** Where and how the company competes (markets, countries, competitive advantage, ...)? Answers to both questions express a global positioning, core challenge and a specific recipe for success. All strongly influence the make-or-buy choice.
- **The key and distinctive operational capabilities the company masters better than its competitor (manufacturing, retailing, customer support, design, ...) define the scope for building data and analytics capabilities so that they support the strategy:** domain-specific datasets or analytics solutions, storage infrastructure, talents, ...
- **Make-or-buy decisions may take place independently in the 4 parts of the data value chain** we described before (generation, collection, analysis and exchange). Among the important questions here: is there a market? what are the dependence risks? Is the market more efficient? How big is the integration risk? How urgent is the delivery? Are internal resources available?
- **Defending the uniqueness and the distinction of the positioning fosters long term value creation.** There are 2 tactics here: increase rarity (make the data source exclusive, source all talents, ...) and reduce imitability (combine technological, human, financial and data resources; embed data resources and capabilities in operational and strategic decision-making). It's possible to copy some part of Google value chain (infrastructure, data, service, engineers, ...). It is impossible to copy the system and in particular the connection between data assets and the business model.



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