TATA CONSULTANCY SERVICES

Building on belief

Discovering the financial value of your enterprise data

Abstract

Enterprises today are faced with the task of prioritizing their data resources based on their value. Serious consideration is also being given to classifying data as assets of economic value and institutionalizing them in financial statements. Data stored in isolation is worth little, but when used, generates value as an outcome, by way of taking action from derived insights or combining with other data, thereby qualifying the fundamental definition of an economic asset – 'creating economic value'.

This paper investigates the classification of data as an economic asset and applying various valuation approaches to it, as per organization maturity.

The case for data valuation – data as an asset

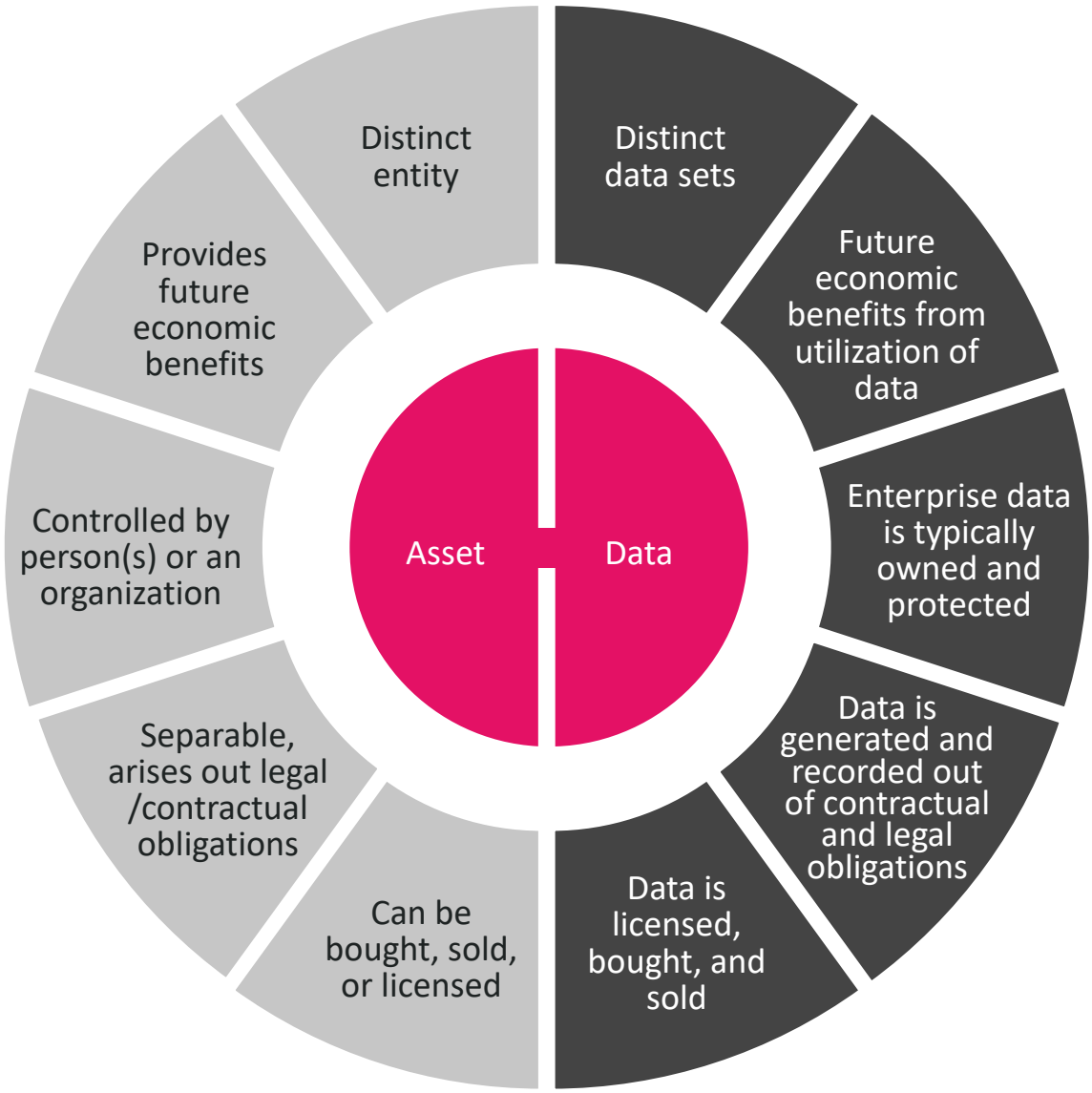

Figure 1: Comparison of data and economic asset

Well-accepted accounting and economic principles provide a clear definition of an asset as highlighted in Figure 1.

Viewing data as analogous to intangible assets, it is certainly separable and may well arise out of contractual obligations. A case in point is the consent taken from consumers to collect and maintain data for executing contractual obligations such as invoicing, enrolment, and claims processing. Further, enterprise data is increasingly viewed as an asset in mergers and acquisitions.

This leads us to ask whether, and how, the value of data should be reported in the balance sheet. There are numerous cases for and against the inclusion of data in the balance sheet, with most emphasizing the lack of a clear relationship between value and repeatable usage, time, divisibility, and quantity.

The above challenges can be resolved by viewing data as the precursor to information. Adapting the widely used Data, Information, Knowledge And Wisdom (DIKW) pyramid (see Figure 2), data can be seen as being utilized to generate information, which in turn translates to knowledge before finally resulting in overall wisdom.

The transformation of data through the DIKW chain will result in its derived value changing over time. Different types of data, or datasets, based on the transformations or use cases eventually lead up different paths through the DIKW hierarchy. In other words, the value that can be derived from data eventually depends on how it is utilized and transformed.

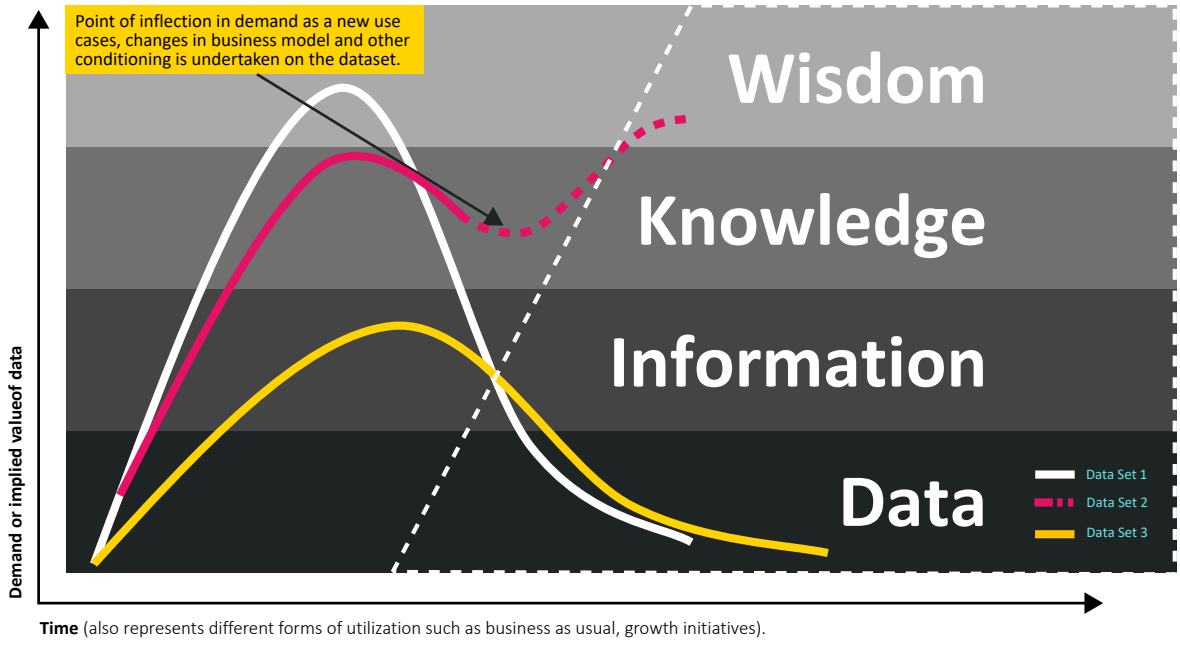

Figure 2: The DIKW pyramid in conjunction with changing demand (implied value) of data over time and use cases. The 'red' dataset underwent a slightly different trajectory as new use cases may have been found as its demand started plateauing.

Considering data as a precursor to information, knowledge, and wisdom, with its value derived from its utilization and transformation, along with the laws of information[1] – we generate the six principles of data.

[1] Measuring The Value Of Information: An Asset Valuation Approach- Daniel Moody, Department of Information Systems, University of Melbourne & Peter Walsh, Simsion Bowles and Associates

The six principles of data valuation

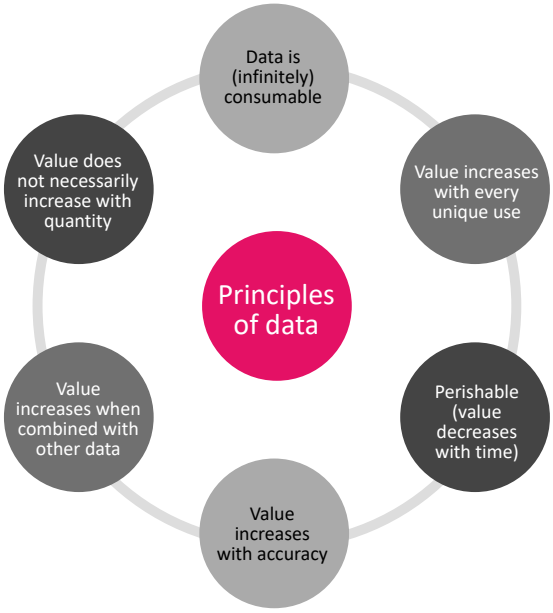

Table 3: The six principles of data

The six principles of data valuation when applied, reinforce the many similarities data has to an accounting asset. An asset is only as valuable to an enterprise as its usage. Similarly, an enterprise may utilize data collected about its customers to cross-sell and up-sell products and services.

Typically, assets depreciate over time (exclusions being land and other resources in limited supply). The depreciation follows the declining capability of an asset to generate value when utilized in the same way. If the asset is either maintained, upgraded or combined with other assets, the depreciating value curve can be reveresed. Drawing a parallel, we can see that old or obsolete data will have lesser value to an enterprise than up-to-date data. When combined with other data sets, or upgraded to include more up-to-date records, the data's value derivation can be extended – as illustrated in Figure 2. Production assets typically work in tandem (combined with other assets) to create products that have a higher value than those produced by the same assets in isolation. A customer dataset, containing names, age, and contact details, is far more valuable for an enterprise than any of those elements in isolation. When combined with sales data, the utility of the same customer data increases further, adding to its potential value to the company.

Considerations of quality and quantity of assets apply to data as well. It is important to know that more is not always better, and that the value of data depends upon its quality.

The said production assets may depreciate over time as the value derived from them reduces. Similarly, an outdated customer dataset would exhibit a similar pattern. Just as the manufacturing production assets would be upgraded to sustain their value, the customer dataset should also be continually updated with new attributes.

Ultimately, two companies may end up owning similar production assets, but by virtue of their business acumen, they may derive varying value from those assets. The customer dataset discussed here would also impart varying values based on the data and analytics maturity of the enterprise. This underscores the fact that the value of data depends on how it is utilized, with its value increasing with every unique use.

While assessing data by principles of valuation points to its similarities with assets, one point of difference stands out. Data can be consumed infinitely, whereas an asset tends to deplete with usage. For example, the value derived from the production assets would be limited by their capacity. However, in the case of data, the value would only be limited by the size of the customer universe it serves, not by the capacity of the dataset itself.

What data to value?

The value of data is ultimately defined by its potential for use. Data in high demand would be deemed more valuable. If one were to plot the demand for a dataset against time, one would initially witness an increase in demand (and implied value) with time. This represents the first phase, where new use cases would be developed, following which data would progress toward getting transformed into information. As further use cases are developed, the dataset's demand and implied value would increase on account of being interpreted as knowledge, and ultimately wisdom, that would help an enterprise develop a significant competitive advantage. Over time, the dataset may lose importance, and the value it generates would start declining. At this juncture, the enterprise may move to an updated version of the dataset, or to a different dataset. The exception to this rule applies only in cases where changes in technology or business models allow additional use cases to leverage the same dataset, further propelling its value.

Taking the same example forward, a set comprising customer data would enable value via increased sales. Once the list is exhausted, its value to the sales teams would shrink. An updated version of the same dataset, containing additional information such as spending history and investment routines, could also generate incremental value via cross-sale and up-sale. For all practical purposes, though, the original dataset would seem to be of little to no value unless new insights or use-cases help generate higher sales. An interesting aspect of the above exercise is that in the real world, sales teams do not move from one dataset to another. Rather, they manage and update the data regularly to derive a continuous value stream. However, since value is typically defined at an instant, snapshots of a continually updated dataset are also viewed as separate datasets.

Now that we have established that data's value ultimately depends on its demand, and that it could vary with time, let us take a look at how exactly data can be valued.

Valuation approaches

Taking into account the principle that data's value depends on its usage and analogous to well-defined valuation approaches for assets, we can establish methodologies to value data based on its potential for use.

The incremental income approach values data on their net present value of the future value generated from their usage, quite like assets are typically valued.

The **replacement cost concept** is used in scenarios where an enterprise may inherit or build data assets whose use case value is not immediately known. For instance, there may be datasets whose cost of capture, ingestion, and maintenance could be higher than the observed use case value they may generate. Low levels of insight and regulatory compliance could also be reasons an enterprise may prefer using a cost-based approach.

The **market equivalents approach** is used where the value of assets via cost and incremental income approaches may not be consequential.Take the recycling industry, for instance. Here, the waste generated by one industry finds value in another. Similarly, an enterprise may own data whose use case or value may seem too little but which may be immensely valuable for an enterprise from another ecosystem (read data products and data commercialization). In the end, even this approach ultimately lines up with the principle that the value of data ultimately depends on its use.

The three approaches have been summarized in Figure 4.

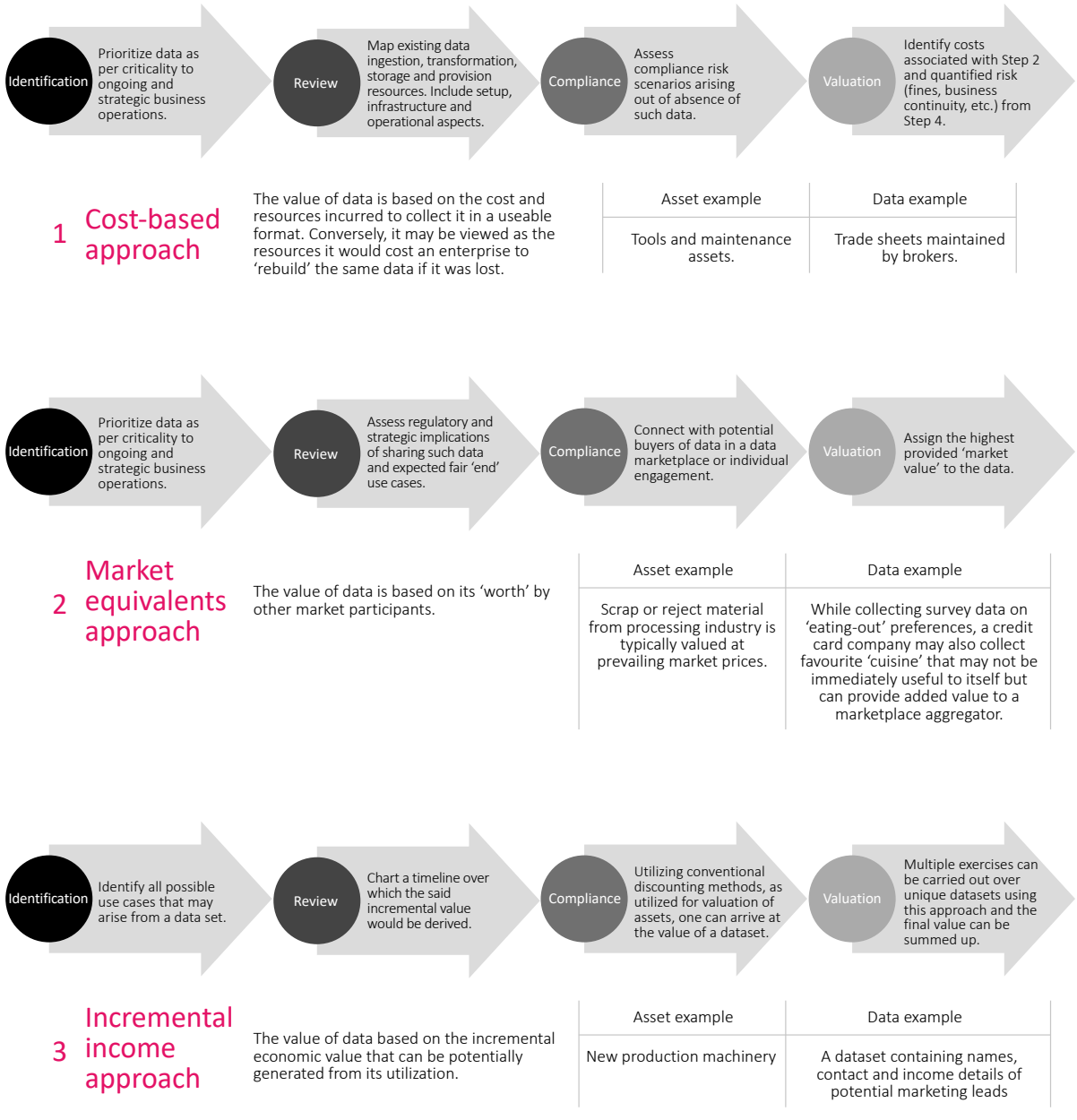

Figure 4: Valuation approaches

Intrinsic and extrinsic value – price discovery

Imagine a scenario in which an enterprise reports the value of its data, using one of the approaches in its balance sheet. How would the market value such a company? And what happens if a potential investor uses a different approach and arrives at a different quantified value for the same data?

In such a case, the enterprise would consider its derived value – intrinsic value and the investor would trust his valuation – extrinsic value. No transaction would be possible without the intrinsic and extrinsic values matching. And without a transaction, there would be no basis to assign a common, sacrosanct value to any enterprise data.

This match, or price discovery, is vital to facilitate a transaction and to establish a basis for future valuations. A market full of potential participants creates the most efficient means of price discovery, though we still are some way away from a scenario that can enable transparent price discovery. Until we get there, enterprises can consider participating in a peer-to-peer transfer of data by way of agreements, mergers, and acquisitions, or specific sale of data assets.

Your data maturity defines what valuation approach is appropriate

While the concepts to establish a path toward valuing enterprise data is well laid out, the truth is that enterprises may face a host of other challenges. Establishing clear metrics to track demand and, as a corollary, the value of datasets requires unearthing use cases through analytics and AI, and finding reliable partners capable of facilitating price discovery.

Moreover, the ability and capability to value data would also depend on the enterprise's stage of data maturity. Low maturity enterprises may need to transform internally before attempting to accurately value their data. Some may simply assign a replacement value to the data as they would be unaware of potential use cases. As maturity increases, however, enterprises would be more aware of their immediate ecosystem and would have the confidence to undertake transactions using the market equivalents approach. Enterprises at the highest maturity would be aware of their own ecosystems and adjacent ecosystems. As a result, they would be adept at finding exhaustive use cases not just with the incremental income approach but applying multiple approaches to arrive at the most optimized value.

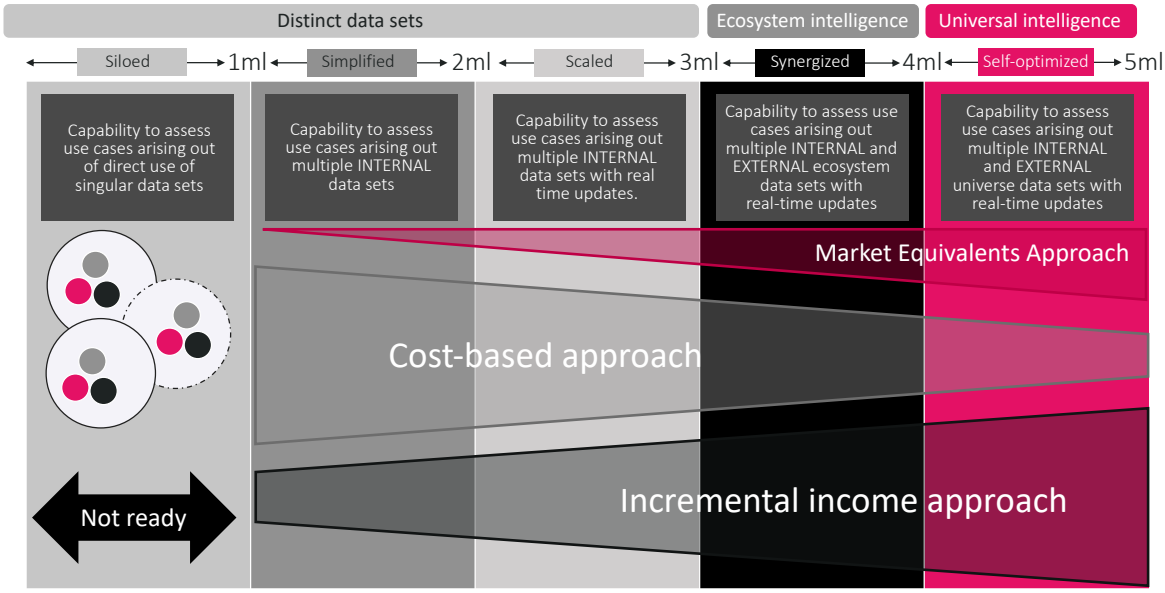

Figure 5: Data valuation approaches as per data maturity

Conclusion

Data valuation has traditionally been viewed as a tricky subject. The presence of standardized procedures and uses that may effectively define data as an accounting asset is a key to resolving this challenge. Historically, it was the typical widespread usage of business assets that led to the formulation of standardized accounting principles. While these might be missing for now in data valuation, mature enterprises can certainly take the lead in finding out and recording intrinsic and extrinsic values for their data.

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Ankoor and his team help life sciences and healthcare enterprises grow and transform by building diagnostic and predictive analytical models and providing services from assessments to insights and reporting. In his 28 years of work experience, he has worked with leading financial services companies.

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