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Data Exchange

Digital Collaboration for a Data Economy

A Guide to Digital Collaboration – Full Version



INTRODUCTION

Today's executive and digital leaders across private, public and third sectors need to consider the *Exchange of Digital Value* to position their organisations to create value from their digital assets and participate in the Data Economy.

Data Exchange is an economy-wide program to facilitating the *Exchange of Digital Value* at scale. We believe Data Exchange will be not only a mechanism for resolving many of the challenges organisations face today in leveraging their respective digital assets, but a catalyst for unlocking new value creation and knowledge that will secure a better future for many generations to come. We have sound reasons for believing that Data Exchange can deliver so much. The prosperity, wellbeing, innovation and social infrastructure we enjoy today were all the product of *Value Exchanges* of different kinds. Whether the exchange of communication facilitated by telecommunications that connected people around the globe to build and enrich engagement, or the exchange of products and services that underpin our economy and global trade and the opportunity for businesses to flourish in it and employ people, or stock markets that provide opportunities for investment and growth in equity. All of these and others are in fact the foundations for the world we live in, without which almost nothing we have created would exist as it is. These *Value Exchanges* created the impetus for organisations to invest in their preparedness to participate, providing an incentive to do something rather than nothing. These Value Exchanges brought the opportunity for innovation and collaboration to create new value. These Value Exchanges provided the way to break through to new models, new industries and new ideas that fueled the global socio-economic growth which resulted. That is exactly what is needed in the digital sphere to turn the discussion about data into the difference data can make. The Exchange of Digital Value can catapult organisations forward to achieve exponential results. This is the moment where your pathway to digital success becomes clearer. Today's executive and digital leaders across private, public and third sectors need to understand the Exchange of Digital Value to position their organisations to create value from their digital assets and participate in the Data Economy.



This is the moment where your pathway to digital success becomes clearer...

HIGHLIGHTS

Reading this paper will give you insight into:

- How Value Exchange is a key foundation for digital value creation
- The Dichotomy of Data – how data is our most abundant, most critical yet most underutilised resource.
- Diversity of data as a practical way of considering the value of data
- The need for Democracy in Data to unleash the ability for all organisations and sectors to create far more value from the data universe.
- How Data Collaboration will create more success and benefit than any of the prevailing approaches.
- How the ecosystems organisations already operate in can be the key to digital success.

OBJECTIVES

The objectives this paper will address include:

- Help leaders sift through the confusion and build clarity for digital success.
- Change the discussion about data to help make a real difference with data.
- Clarify why Data Exchange is important to consider sooner in the digital journey rather than later.
- Outline how Data Exchange is distinct from other prevailing and emerging terms and themes.
- Bring hope to organisations struggling to create value with digital assets and create awareness of the power of an ecosystem approach to data.
- Define some practical steps to making Data Exchange work for you.

INTRODUCTION

INTENT

This paper seeks to provide strategic guidance to executive and digital leaders in industry, government and the third sector on the emerging opportunity presented by Data Exchange. Our intent is to bring clarity to the conversation and highlight some key considerations to empower leaders with the ability to initiate and deepen their participation in the burgeoning Data Economy. The result we hope to serve is that leaders of organisations from every sector are better able to position themselves to create value from their digital assets, and collaborate deeply, meaningfully and persistently within their ecosystems to address shared purposes that deliver socio-economic growth and deeply impact human prosperity and wellbeing.

STRUCTURE

Data Exchange is an important emerging topic, and as such there is a balance to be struck in this paper because of the preconceived notions readers may have already developed anecdotally and the lack of a commonly held framework for understanding. We have therefore intentionally not structured this paper in the way you might expect. Our rationale in doing so is to provide a solid foundation upon which the content you may expect to see first will make more contextual sense.

Our paper has three sections. In the opening section, we provide reflections on “Why Data Exchange” is an important topic worthy of serious consideration and action, and then in the second section address questions about “How we create the conditions on which Data Exchange can best deliver the nascent value it offers. The paper then ends where you may think it would begin, by answering the question “what is Data Exchange”. Here we provide our definition in context of the first two sections and some practical perspectives to get started with Data Exchange.

Having laid out the structure of this paper, let’s jump in!



DATA EXCHANGE: WHY

The dichotomy of our time is that data is the most abundant resource we have and the most critical resource we have, yet strikingly is our most underutilised resource!

THE DICHOTOMY OF DATA

Data is the *most abundant resource* we have with organisations literally stockpiling it at an unprecedented rate in recent years. Many would agree too that data is also our *most critical resource* with economic indicators showing diminishing incremental gains across most sectors that demand new insights and models and the persistence of besetting wicked problems that have thus far proven too complex for humanity to solve.

It is striking then that data is likely our most underutilised resource. To use a crude analogy the observable evidence suggests that where we are at with data in the digital world, is where we were in the physical world when we relied on the horse and cart!

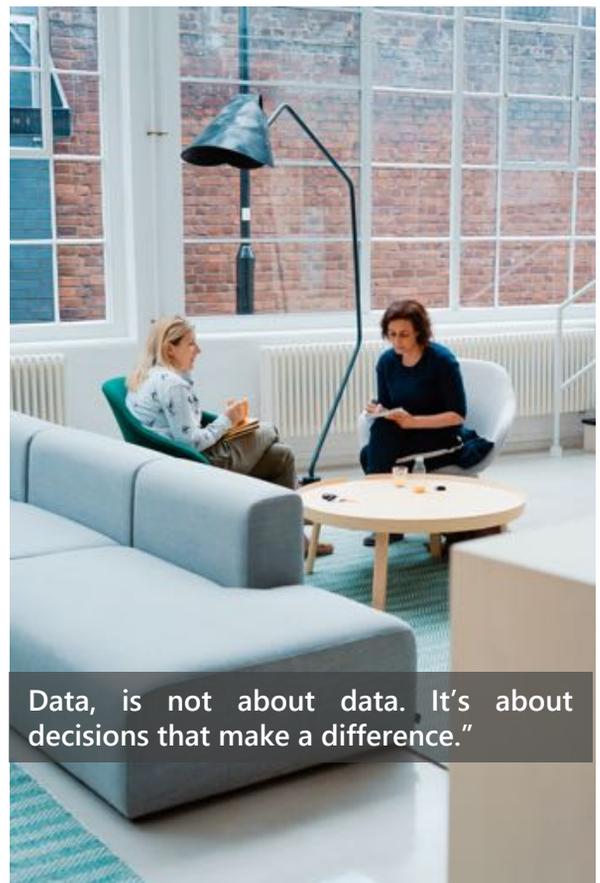
...where we are at with data in the digital world, is where we were in the physical world when we relied on the horse and cart.

That's not to suggest data has not delivered value at all. Specific sectors are leveraging data to deliver significant value. The Financial Services sector has arguably invested more in data programs and extracted more value than any other sector to help drive customer intelligence. Telecommunications organisations have recently diversified their businesses and developed new offerings using their data assets. Marketing businesses are now significantly driven by digital insights. The property sector has some great examples of successful data monetisation strategies. Transport & Logistics organisations have had to find ways to collaborate with data to better synchronise their activities to be competitive. Research is another sector that collaborates with data with some degree of success. Governments have enabled other sectors easier access to their data through Open Data programs. Finally, cities like Amsterdam and Copenhagen were some of the early Data Exchange efforts which provided helpful learnings.

Many of the above sectors now have specific examples of organisations who have started successfully collaboration within ecosystems, some of which include organisations who are the largest data producers in the world. What that analogy does highlight however is that the number of organisations producing tangible and measurable outcomes with data at real scale globally is very small. The vast majority of organisations are not leveraging data as a new way of doing business and are not transforming into organisations who harness the power of data across every decision, process and engagement.

Data on its own of course does nothing. It needs to be curated, prepared, processed, transformed, wrangled, manipulated, engineered and visualised. Most importantly the results of these activities of refinement must produce insights that are applied to problems and opportunities. Other than the very few, at best organisations are struggling their way through these processes in isolated pockets and in fragmented ways to create value from data.

Data, is not about data. It's about decisions that make a difference. Data only has value because it has the potential to inform decisions. Its value is therefore in its utility. To better understand why organisations for the most part are not deriving value from data, its worth looking at the underlying elements that influence the utility organisations derive from data.



Data, is not about data. It's about decisions that make a difference."

DATA EXCHANGE: WHY

THE VALUE OF DATA

The global value of information assets is growing exponentially. In 2020 for example the value of personalised data as just one class of data in the EU alone is valued at one trillion euros (that's about 8% of the EU's total GDP).

Various perspectives on the value of data have been published. One particular model which has proven useful, called the "Five V's of Big Data", focuses on factors that determine the impact of data on organisations and posits that this impact is related to the *Volume, Velocity, Variety, Veracity and Value* of data. The Value of data (the utility derived from it) in this model is influenced by the other four factors.

In the model, Volume of data is the amount of data available to an organisation from a myriad of sources; Velocity relates to the speed at which data is generated; Veracity is the degree to which data can be trusted; and Variety is the types of data – structured, semi-structured and unstructured. Data Exchange if understood appropriately is positively correlated with each of these measures providing a powerful way for organisations to extract more value from data.

Data Exchange expands the Volume of data available to organisations in any given ecosystem by providing the impetus on the supply side for an organisation to make its own digital assets useable and available and spurring the demand side as the number of collaborating organisations in the ecosystem rises. As Volume rises, Data Exchange facilitates better Velocity through this process as more data is created within the ecosystem and organisations are more easily able to access it. Data Exchange also provides for more Variety as the collaborations become more persistent. Finally, Data Exchange also provides at least the potential for improved Veracity through the system of controls and governance-based trust that develops within an exchange ecosystem.

THE DIVERSITY OF DATA

A view through the five V's model of value however is reasonably generic and hides a richer relationship between Data Exchange and the utility organisations could derive from it. We need a composite measure of sorts that helps us more practically assess the value creation journey. A better semantic descriptive that captures the nature of the value of data through Data Exchange is what we've called Diversity. Diversity is essentially the extent and range of different data sources available within a Data Exchange offering alternate and potentially reinforcing perspectives that can be leveraged to inform decisions.



It encompasses the generic components of value in the five V's model but recognises that a concentration of data assets with the potential for increasing collaborative density unleashes exponential value from data. This can be illustrated as a Value Curve where the more diverse the data an organisations has access to, the more value is available in that data. As a result, an organisations need for Diversity in data grows over time.

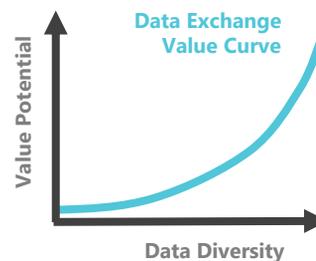


FIGURE 1: VALUE CREATION THROUGH DATA EXCHANGE

Diversity is central to the value of data because the point of data is to establish a digital representation of some aspect of the real world for the purposes of describing, diagnosing and predicting events as the basis for better prescription and prevention.

"Diversity is central to the value if data because the point of data is to establish a digital representation of ... the real world..."

The real world is most often characterised by complexity and an interdependence of constituent elements. Almost universally, reality is more complex than we tend to cater for especially in relation to our impact on it.

Without Diversity in data we cannot hope to accurately represent the real world much less use this representation to enhance our decisions. Every organisation is a system of systems and exists within a wider context. Every process or engagement is deeply connected with human impacts and diverse stakeholders. Complexity is everywhere. Data Exchange enables organisations to better deal with complexity through data Diversity.

DATA EXCHANGE: WHY

VALUE CHAIN OF DIVERSITY

An organisations needs more Diversity in data as it moves through its digital value creation journey. This can be represented as a Value Chain which traces the increasing pursuit for Diversity as the organisation strives to extract exponentially more value from data.



FIGURE 2: ECOSYSTEMS IN THE VALUE CHAIN OF DATA

Organisations usually begin their data journey focusing internally. This often starts at a process level where data is most readily accessible due to higher levels of autonomy. It usually does not take too long before organisations start “diversifying” their appetite for data which drives them to expand into multiple processes within and across each organisational function, and then into multiple functions. Similarly, the pursuit of value creation brings the organisations external ecosystems into focus – customer, partners, suppliers, constituents, members, affiliates and other stakeholders which represent an opportunity to further diversify the organisations data universe.

Organisations...spend around 80% of their time...getting access the data they need...

Diversity may be crucial, but it is a challenge. Survey's over recent years reflect massive growth in the supply of data, but very low and static levels of usage. Survey's of the global data supply reached 40ZB by 2020, or 5,247 GB per person but just 0.5% of this is analysed.



THE DIVERSITY DILEMMA

We've built a world of silos within and beyond our organisations to help us digest the innate complexity in the world in the interest of simplicity and getting results without being bogged down.

Survey's of global data supply reached 40ZB by 2020, or 5,247 GB per person but just 0.5% of this is used for analysis.

Silos become problematic though when organisations looking to enrich and diversify their data driven decision-making capabilities are paralysed by an inability to break through them. Organisations often struggle to access even their own data. Data accessibility for instance was often not engineered into the requirements for information systems with a view to ensuring the data from those systems was available on demand. Often the data held within internal systems is theoretically accessible but requires significant data engineering to build pipelines that secure easy access. In larger organisations, its common also to be unable even to access data from other departments or business units.

Data accessibility has also for the most part not been a focus in curating third-party services. That can mean having to follow a bespoke process to request and then wait for your data or invest resources in lengthy negotiation to amend contractual arrangements with providers. Organisational culture too is a factor where people who control data do so with a view to making it more difficult to access. Concerns around Personally Identifiable Information (PII) as well as Intellectual Property are the most common reasons data cannot be accessed. External data access today is mostly impractical outside of necessity. Identifying the potential data owners, engaging each of them and negotiating access is slow and difficult with success far from certain.

Overall, organisations consistently say that they spend around 80% of their time just finding and getting access to the data they need. Broadening out from each individual organisation, these challenges with diversifying data are shared by almost every organisation. The scale of the problem only makes this more compelling.

To solve this Diversity Dilemma, we need Data Exchange. Data Exchange is the way that we scale the systematic and pervasive ability for any organisation to build a culture that leverages the control it has over its digital assets as a way of facilitating the agile collaboration required to leverage data in all its Diversity. That language is very intentional as you'll see later in this paper.

Why Data Exchange? Data Exchange is the means by which organisations will fully leverage the Diversity in the data universe that unlocks their ability to create value exponentially.

DATA EXCHANGE: HOW

The question [is] do we have democracy in the data realm today? The answer is not surprising given how few observable outcomes we see at scale from the use of data.

We now have a compelling narrative for the importance of Data Exchange – the “why”. The power of diversifying data through Data Exchange is justification for every organisation to seriously consider Data Exchange. At this point we turn to ask “how” in reference to Data Exchange. We’ll look at this from two perspectives. Firstly, describing what the underlying conditions are to facilitate and optimise Data Exchange outcomes, and secondly describing the nature of the collaborations that leverage Data Exchange.

DEMOCRACY IN DATA

The challenges organisations face with data are a very significant impediment to digital value creation on a global scale. To solve this we need to think beyond the traditional scope of organisational transformation. Only at that scale can we define the necessary conditions that optimise Data Exchange.

To solve the challenges organisations have with data we need to think beyond the traditional scope of organisational transformation...

Is there an example of what success at global scale looks like to help us recognise and adopt some principles to solving the data challenge? The greatest example of collaboration we have at scale is the goods and services economy. Although economies operate with very different underlying conditions, there is one kind of socio-economic context within which a goods and services economy has been shown to optimise outcomes and that context is democracy. It may at first glance seem to have no place in a discussion about data. This is true in the purest definition of democracy but if viewed as allegorical, democracy provides a comparative framework for considering the macro-level transformation that is required in data. Democracy at its essence blends a **culture** that recognises the need for equal opportunity and broad participation, with a system of **controls** that provides autonomy in relation to assets and available resources and facilitates the myriad of unimpeded **collaborations** that create value. These “three C’s” are of real value in tracing out “the how” of Data Exchange.

The analogy between democracy and data is of course imperfect, but using the derived principles (culture, control, collaboration) offers a useful perspective.

The combination of these elements – culture, control and collaboration – has powerful implications for resolving the Diversity Dilemma. If we give organisations the latitude and the ability to

...using...principles of culture, control and collaboration...to the problem of lack of data Diversity offers a useful perspective.

to participate in a system that gives them control over their digital resources they will strive to create value by collaborating with others using those resource to do that. The question then becomes, do we have democracy in the data realm today? Are organisations no matter their size or sector able to overcome the Diversity Dilemma? The answer is not surprising given how few observable outcomes we see at scale from the use of data. We have neither the culture, not the systems of control or the collaborations which would make digital value creation on a global scale possible. In these terms, we do not have democracy in data today. We don’t have a culture that values and empowers every organisation in respect of leveraging its own digital assets. We don’t have a systematic way of ensuring autonomy and control over data assets for every organisation. We don’t have mutually beneficial and scalable collaboration between organisations with common challenges and shared purposes aimed at leveraging digital assets to make a difference at scale.



DATA EXCHANGE: HOW

Part of the “how” in regards to Data Exchange then needs to be ensuring a kind of democracy in data where every organisation gets to do more with data through a culture of creating digital value with data, and a systemic confidence in the ability of organisations to control their digital assets whilst engaging in seamless and frictionless collaborations that create value. That should be the high level intent behind Data Exchange including the underlying policies, strategies and culture which facilitate Data Exchange outcomes.

ENGAGEMENT ECOSYSTEMS

Data Exchange is a systematic approach to the pursuit of value creation from data. Our discussion on democratisation helps answer the “how” question in relation to the necessary cultural fabric for enabling Data Exchange. Another part of “how” goes to the nature of the collaborations that leverage Data Exchange. This is important because Data Exchange is not ad hoc. Rather Data Exchange is an intentionally orchestrated program to create digital value and so must be engineered based on the nature of the collaboration.

Data Exchange collaborations are ecosystems of engagement which can be significantly different in several ways.

Data Exchange programs must be engineered intentionally based on the nature of the collaboration.

For instance, a supply chain is one kind of ecosystem where organisations form part of an existing arrangement to facilitate the provision of a particular product or service from origin to final consumption. Other examples of ecosystems include for instance a Co-Operative Research collaboration in which co-equal organisations look to collaborate to achieve an agreed objective. Organisations within a geographic region forming a community which seeks to facilitate Data Exchange oriented towards the local context is another example. There are many more, but in each case the nature of the ecosystem implies a different approach to collaboration which in turn means different nuances to =the appropriate Data Exchange program.

These ecosystems of engagement however should always ideally share some common characteristics in order to produce the best results. Most importantly the ecosystem must have a sense of shared strategic purpose. Maximising end-consumer experience and increasing efficiency for a Supply Chain or Financial Services ecosystem, finding solutions to Water Security for a Research Program, improving policy to facilitate Economic Recovery from Covid-19 for a State Government or improving tourism for tourism operators and other businesses in a specific geographic location. These are all ecosystems that have a shared purpose.

Data Exchange ecosystems must have integrated, adaptable and scalable governance embedded within them...

Ecosystems must also initially be established at a practical and manageable scale but with a commitment and ability to expand and adapt.

Data Exchange ecosystems must have integrated, adaptable and scalable governance embedded within them to maintain strategic focus, build trust and mediate competing objectives.

Ideally, participants should also have complimentary resources, perspectives and capabilities the bring value to collaborations. Last, but not least, ecosystems need to facilitate Diversity in data resources to maximise the value of the exchange opportunity. An ecosystem of organisations with monolithic data resources offers far less value over time than one that brings diverse data sources together.



DATA EXCHANGE: HOW

DATA ECONOMY

Finally, we get to connect the dots to the big picture. Data Exchange creates value at an organisational level by enabling organisations to maximise the value of data across internal stakeholder groups. That value is magnified at an ecosystem level and further augmented by enabling organisations to collaborate with complimentary external stakeholders on shared purposes.

The “democratisation of data” imperative we outlined earlier in this section however means that the nascent potential of data can be made available to every organisation across every sector and community, and in aggregate to every region and nation. The true power of Data Exchange is in the idea that it unlocks digital value creation with almost limitless potential for scale through the organic expansion of ecosystems, the proliferation of ecosystems across sectors and the interconnection of ecosystems. For instance, an ecosystem of organisations collaborating in the transport and logistics sector benefits immensely from the opportunity to access data from and collaborate with organisations in a parallel ecosystem focused on climate and environmental sustainability and vice versa. Again at an aggregated scale above that, both of those ecosystems would benefit from interconnection with an ecosystem oriented around agri-business which has obvious and deep connections to both transport & logistics and climate.

That brings the final piece of the Value Chain we previously introduced into focus as the power of data at scale forms a Data Economy.



FIGURE 3: DATA ECONOMY THROUGH DATA EXCHANGE

A Data Economy makes data a resource which has the potential to deliver deep, pervasive and sustained benefits on a global scale through the creation of new value which impacts every aspect of life for generations to come.

The “how” of Data Exchange centers around positioning for value both at individual level but also at scale to deliver a Data Economy. Having laid this foundation we now turn to a definitive look at what Data Exchange is.

DATA EXCHANGE: WHAT

The point of Data Exchange is to create value which furthers not only the interests of each participating organisation but of the collective ecosystem.

In the previous two sections, we laid a solid strategic foundation in providing both the justification for the importance of Data Exchange (the “why”) as well as the conditions and context (the “how”) for Data Exchange. In this final section we address what exactly we should mean when we talk about Data Exchange and through this provide some tactical guidance to organisational leaders.

DEFINING DATA EXCHANGE

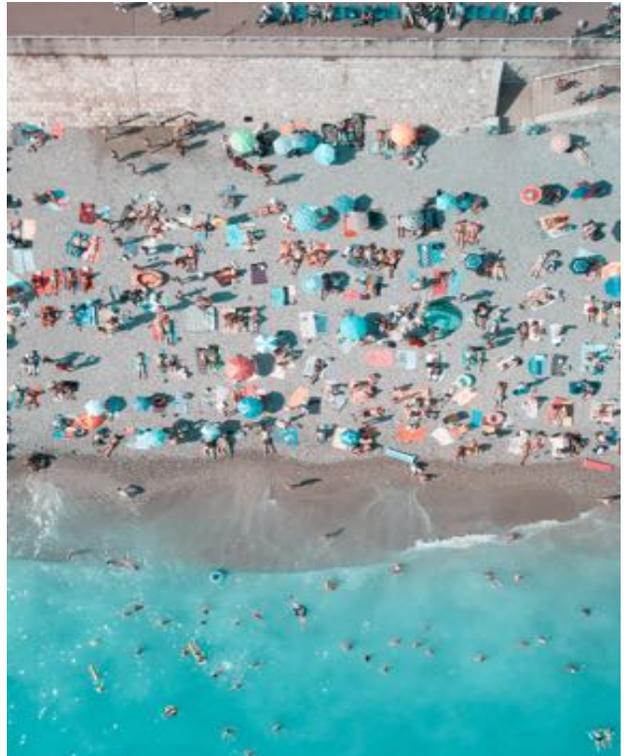
Defining exactly what we should mean by Data Exchange is important in context of the previous sections because we need to make sure that our definition of Data Exchange captures the full spectrum of value which is available to organisations.

...we need to make sure that our definition of Data Exchange captures the full spectrum of value which is available

Clarity is vital when there is the potential for people use a semantic labels for very different things.

Confusion does not serve the interests of organisations grappling with related problems. A browser search of the term “Data Exchange definition” for instance yields a list of online resources which mostly focus on the technical perspectives on enabling data to be exchanged between computer programs. Wikipedia says that (https://en.m.wikipedia.org/wiki/Data_exchange) Data Exchange is “the process of taking data structured under a source schema and transforming it into data structured under a target schema, so that the target data is an accurate representation of the source data. Data exchange allows data to be shared between different computer programs.”

Although this definition is clearly related to what we’re considering, this is a technical definition as opposed to a strategic one that is centered around organisational and sectoral digital transformation. More to the point, a technical definition of Data Exchange provides very little guidance to organisational leaders in relation to the strategic direction to set in building a program to position for the significant value at stake.



Data Exchange is a Systematic Program which leverages Digital Infrastructure, that enables Collaborative Engagement to create Collective and Cumulative Value.

The challenges we’ve outlined previously, and the opportunities offered cannot be understood much less tackled through a technical definition of Data Exchange.

Defining Data Exchange may be necessary, but it is also challenging. A rigid definition has the potential to set unrealistic aspirations and reduce the ability for organisations to adapt to specific contexts. It can also discourage valid approaches that are in fact delivering value. Any progress that is making some difference should be applauded and pursued. However, a definition must capture foundational elements that ensure organisations doing “something” don’t misinterpret what they’re doing as “job done”. Trading off the long term by ignoring the strategic considerations effectively takes value off the table, jeopardises confidence and potentially resulting in expensive and time-consuming reworking of activities which are not delivering expected value.

Despite that we believe it’s important to balance these objectives and put a stake in the ground to provide clarity so here is our definition. **Data Exchange is a Systematic Program which leverages Digital Infrastructure, that enables Collaborative Engagement focused on utilizing digital assets to create Collective and Cumulative Value.**

DATA EXCHANGE: WHAT

Let's unpack this definition by distilling it into its key elements. Data Exchange is:

- 1) a Systematic Program
- 2) supported by enabling Technology Infrastructure
- 3) for the purposes of Digital Collaboration
- 4) to create Collective and Cumulative Value

1. A Systematic Program

Data Exchange is fundamentally a program initiated with a broad perspective aimed at the strategic transformation of ecosystems and their constituent organisations. This point cannot be underemphasised. Implementing technology alone without a rigorous program will fail to capture the full spectrum of value available, and potentially jeopardise the ability to capture any value at all.

2. Enabling Digital Infrastructure (Technology)

Technology is central to Data Exchange. Without it your program will deliver very little if any practical value. Some technologies can be sourced separately and used in parallel with each other, but others are best integrated into a single platform. More on this in the Digital Infrastructure section later. Together these technologies must provide seamless, frictionless control to each digital asset owner over their assets (remember that control is one of the ideas behind democratisation).

3. Digital Collaboration

Data Exchange is about breaking down siloes and delivering diversity of data to organisations and their ecosystems. Collaboration (another one of the ideas behind democratisation) isn't just discrete sharing. It's working with diverse digital assets (both yours and others) to collaborate internally and/or externally by analysing, visualising and interrogating digital assets.

Collaboration isn't just discrete sharing. It's working with diverse digital assets (both yours and others) to collaborate with other stakeholders ...

4. Creating Value

The point of Data Exchange is to create value which furthers not only the interests of each participating organisation but of the collective ecosystem. An ecosystem of organisations with shared purposes able to easily access and use digital assets they need on demand to support their collaboration produces cumulative value as the whole becomes greater than the sum of the parts.

NOT EXCHANGE

Bringing some rigour to our understanding of what Data Exchange should mean, is helpful in considering the value of other approaches that may be interpreted as being equivalent to Data Exchange. In recent times the Open Data movement has seen very significant global activity as especially Governments and third sector organisations have rightly moved to making their data available. Open Data has indeed contributed positively in many organisations, but it fundamentally lacks the impact on culture, the provision of controls or the facilitation of collaboration around shared purpose and so has fallen short of the expectations many had of it .



Data Sharing is another more recent drive framed around extracting value from data. It goes further than Open Data recognising the need for some democratisation and control as well as the importance of diversity in data but also falls short of delivering the full spectrum of value that can be attained. Significantly, data sharing does not fully leverage the breaking down of siloes which is inherent in active, organic and persistent collaboration between disparate stakeholders. Organisations may have used Open Data or Data Sharing initiatives to derive some value but it's clear in contrast to Data Exchange as we've defined it that there is inherently less potential in these approaches to create value.

Likewise organisations have for some time sought to collate their data into data warehouses or data lakes. These too are a step on the right direction, and certainly as they have evolved there is some overlap with what we've described.

...in contrast to Data Exchange as we've defined it that there is inherently far less value in Open Data or Data Sharing

However, from a high level it suffices to say that the primary focus of these is improved management and use of internal data resources as opposed to a focus on ecosystems and facilitating deep collaboration between disparate stakeholders. All these other approaches in varying extents negate some of the available value.

DATA EXCHANGE: WHAT

PRINCIPLE, POLICY, PRACTISE

As we concluded above, Data Exchange is most certainly a Program rather than just a platform. As a program, Data Exchange needs to be guided by principles which relate to the “how” we covered previously. A Data Exchange program must first and foremost have the democratisation of data in mind in context of the nature of the ecosystems which are in view. That means ensuring ecosystem participants foster an appropriate culture, have the right control and the intent to collaborate with shared purpose. The program must delineate these shared purposes as well as providing for program governance to manage the program and oversee the development of appropriate policies.

Importantly, significant attention in relation to policy must also be paid to Data Ethics as the basis for the value judgements that underlie the program.

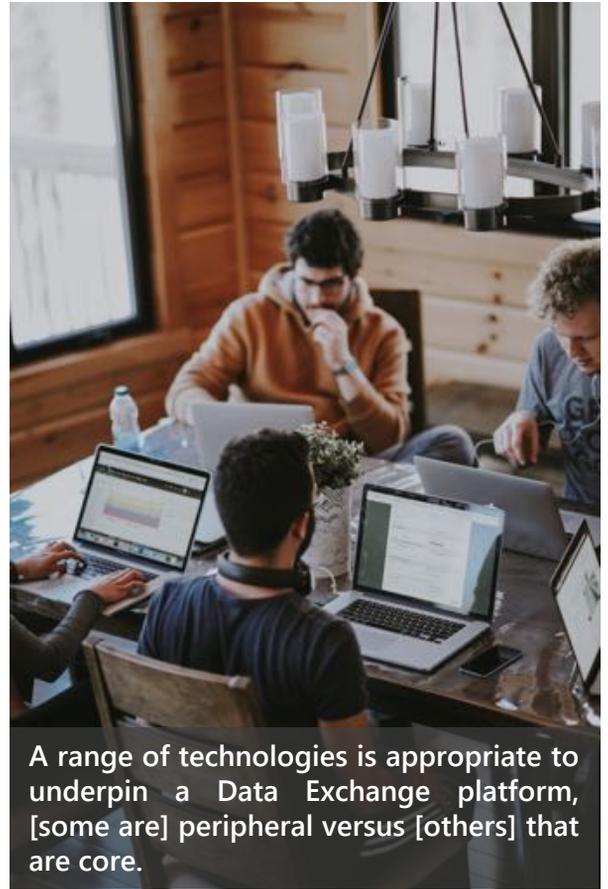
The program must delineate these shared purposes [and] governance [with] appropriate policies.

Data Privacy and Data Security must also be addressed, and the functioning of the technology must reliably manifest these elements of the program. These elements should be designed into the program from the outset to create alignment, build trust and negate compromise.

With principles and policy in place, practical elements of the program need to be considered. Each organisation should understand its maturity in relation to the state of its digital assets and the value it extracts from them. An ecosystem approach implies that the ecosystem is only as good as the weakest participant. In addition this maturity evaluation identifies gaps which the ecosystem must look to provide supporting resources for to ensure participants can fill those gaps. The program needs to recognise its impact on alignment of structural and process related considerations as well as the infrastructure and physical assets that are related to the collaboration of the ecosystem. Finally, specific frameworks that may need to be in place to facilitate the collaboration such as Data Trusts need to be defined and developed as required to mediate disparate organisational objectives.

DIGITAL INFRASTRUCTURE

Although our emphasis in this paper has been strategic and non-technical, we would be remiss if we did not at least touch on the technology. Technology is central to Data Exchange, and without it there is very limited opportunity for value creation. Technology must embody the program providing a platform for executing on the principles and policy and enacting the collaborative enrichment of collective intelligence.



A range of technologies is appropriate to underpin a Data Exchange platform, [some are] peripheral versus [others] that are core.

A range of technologies is appropriate to underpin a Data Exchange platform, but its important to make a distinction between those that are peripheral versus those that are core. Peripheral technologies support individual organisations participating in an exchange ecosystem with the ability to put them in a position to participate. Peripheral technologies in Data Exchange generally do not need to be shared. Core technologies however do need to be shared in order to deliver the functions that are necessary to deliver the required outcomes. Our focus here is on providing some tactical guidance on core technology to support a Data Exchange program. We intentionally refer to the technology for Data Exchange as Digital Infrastructure because we believe that provides a tangible point of reference that most accurately positions what the technology should do. Like physical infrastructure in the economy, the shared technology should provide organisations participating in the program with seamless and frictionless control over their digital assets and the ability to leverage these for collaboration. The analogy is important because physical infrastructure is what democratically empowers every organisation to participate and collaborate in a physical economy, which is what enables the physical economy at aggregate to scale. Digital Infrastructure should be no different. As we articulated in previous sections, this scale is ultimately what leads to a Data Economy.

DATA EXCHANGE: WHAT

FUNCTIONS OF EXCHANGE

So what does a Data Exchange program supported by enabling technology look like from the perspective of the lead organisation/s in the program? Here are some of the functions of Data Exchange.



INTERNAL COLLABORATION

Data Exchange should enable the lead organisation/s to collaborate internally across business units to enhance their business and/or address shared purposes.



ECOSYSTEM COLLABORATION

Data Exchange should enable organisations to easily collaborate independently of the lead organisation/s to enhance their businesses and/or address shared purposes.



EXTERNAL SHARING

Data Exchange should facilitate the ability to share data on demand easily and securely with nominated external organisations to enhance their business and/or address shared purposes.



INTERCONNECTION

Data Exchange should enable interconnection with other ecosystems to exponentially expand the ability of all organisations to enhance their businesses and/or address shared purposes.



ECOSYSTEM ENABLEMENT

Data Exchange should facilitate full program and platform access to a scalable ecosystem of organisations to enhance their business and/or address shared purposes.



CROWDSOURCING

Data Exchange should enable organisations to access complimentary resources and capabilities in the ecosystem to enhance their businesses and/or address shared purposes.



DATA CURATION

Data Exchange should allow easy and secure external data access for both the lead organisation/s and the extended ecosystem to enhance their businesses and/or address shared purposes.



MARKETPLACE

Data Exchange should incentivise organisations to build the value of their digital assets and to monetise their participation to enhance their businesses and/or address shared purposes.



EXTERNAL COLLABORATION

Data Exchange should enable the lead organisation in the program to easily and securely collaborate with nominated external organisations to enhance their business and/or address shared purposes.



AGGREGATE INSIGHTS

Data Exchange should enable researchers governments and others to easily aggregate diverse data to inform better policy and investment and provide evidence based insights that deliver socio-economic purposes.



DATA EXCHANGE: WHAT

Tech Tips

Following on from the higher-level commentary above, we offer some guidance on some of the specific capabilities which in our experience the technology platform that supports core functions of your program should provide. Guidance is generic in nature and focused on those aspects with clear linkages back to the foundational concepts we've explored.

Architecture – the platform should be architected to support scale through confidence and trust to facilitate the creation of value. The provider should not have access to your data unless this is consented.

Authority – the platform should enable delegation of roles in relation to the management of digital assets and usage of the platform to facilitate broad participation and ensure distributed risk.

Collaboration – the platform should facilitate secure collaboration between users from any organisation ideally with integrated access to tools that facilitate the interrogation and visualisation of data.

Cloud - the platform should be hosted in the cloud to provide secure and easy access to users across disparate locations, in a data center with a robust physical security program and multiple certifications, including SSAE 16 certification and be agnostic of hosting provider.

Content - the platform should be compatible with any data in any format as well as digital content and facilitate automated profiling and pipelines wherever possible.

Delivery - the platform should be available "as-a-service" to negate expensive bespoke development, reduce total cost of ownership, support consumption-based costs and facilitate scalability.

Entitlements - the platform must protect the data rights of every participating organisation and facilitate confidence in the program by providing granular entitlement controls which effect consent.

Governance – the platform must provide data owners with appropriate data governance capabilities to ensure digital assets always remain under their control.

Integration – the platform must be able to integrate (or connect) with external third-party systems as required.

Maintenance & Support – the platform should be continuously monitored for service impacting events. Security and anti-malware patches must be applied automatically to ensure the platform is always up to date. Only necessary staff should have secure access to the platform and support activity must be logged

Monetisation – the platform should facilitate avenues for monetisation and incentives for innovating with data to spur value creation. Specific capabilities should include payment processing and commercial lineage related to engineered data.

Protection – the platform should enable organisations to fully comply with relevant privacy legislation and ideally comply with leading Data Protection standards such as GDPR. The platform must provide the right to view, amend, export or delete any information that is held on your behalf, including anything held by 3rd-party services. The platform must ensure that consent is given during the

sign-up process for all users and you can withdraw this at anytime

Resilience – the platform should be held in a relational database and encrypted cloud data repository across multiple availability zones within a region, and the database should be replicated synchronously for fast recovery with back-up to a separate data center of your choosing to ensure the platform can be restored in the event of a regional failure.

Scalability – the platform should scale from individual organisations and small ecosystems to large ecosystems of organisations and facilitate interconnection to other ecosystems.

Security – the platform should provide multiple layers of security controls to

protect access and be based on the principle of least privileged access control. Measures should allow close route monitoring and network traffic anomaly detection. Encryption must be used for all data in transit and at rest, and all requests must be handled to ensure all traffic is protected. Appropriate certifications for the vendor such as ISO/IEC 27000 should be in place to ensure best practice in Information Security Management is followed.

Services – the platform must be augmented with services delivered by the provider to ensure the alignment between platform and program is managed and maintained. Data Exchange is fundamentally a program which implies this alignment is crucial.

User Experience - the platform should make it easy for technical and non-technical resources to use, where functions that do not require technical skills can be done to encourage broad participation and foster an inclusive data driven culture.



DATA EXCHANGE: WHAT

A PRACTICAL PATHWAY TO ACTION

The final piece of the Data Exchange puzzle, relates to providing simple advice on getting started. That is the inevitable question whenever leaders are faced with a significant amount of information on an emerging area. Here are some practical steps to planning, initiating, managing and expanding your Data Exchange program.

PROBLEM

Identify and Define a Problem

As the sayings go, “don’t waste a good crisis”, and “necessity is the mother of all invention”. Human ingenuity, where we break down barriers and do amazing new things, almost always starts with a problem. A leader or group of leaders at some point, recognises the value in solving a specific problem and the need to formulate a plan to do so. Pick a problem that potentially can make a big difference to your organisation and the broader ecosystem within which you operate. Pick a problem with complexity to it, where it seemed too difficult to address and where its not immediately obvious how you would solve it. In most cases, as you read this, there will be at least a few candidates springing to mind. Spend some time defining the problem. How big is it, who does it affect, how does it affect them and what would happen if you could solve it? Generate some questions which you could ask to better understand the problem and the potential avenues to solving it. Don’t stop with one problem. Build you program to address other emerging problems.

PEOPLE

Engage an Ecosystem

Every problem that impacts not only your organisation but a broader set of stakeholders and is complex, will require an ecosystem approach. Every year that goes by the problems that face organisations will increasingly not be solved in isolation. Who are the organisations on your ecosystem with a vested interest in solving the problem? Which of them are more progressive about technology and data? Who has data that is likely needed to further define the problem and identify and prioritise the solutions? Who are the organisations with resources or access to resources – skills, funding, other resources? Which organisations have great “brand equity” whose support and advocacy will stimulate broader interest and catalyse consensus? Are there personalities who will provide strong leadership, vision, courage, curiosity and a propensity for some risk? Engage them and carefully select the program leaders and give them a role in dragging the agenda forward, advocating for the program and leading and governing key aspects of the program.

PROGRAM

Lay the Foundations

Plan and implement the foundations for your Data Exchange Program. Invest in developing specific policies and frameworks for privacy, security and ethics in relation to how your program will use data. Identify gaps on the ecosystem such as particular skills, and find complimentary resources to engage which can be used to help fill those gaps. Have ongoing resources there to fill key supporting roles to enable ecosystem participants to get onboard and thrive. Develop a marketing and communications strategy with initiatives to create awareness and interest and expand to ecosystem over time. Design a light ands agile governance framework for managing the program. Prepare for collaborative density – identifying new problems that derive from the work you’re doing on current problems or emerge from the external environment. Address the technology - is there a platform available to support your program which can help you produce fast results, and will the provider be able to provide assistance to augment the platform and align it to the program? Can you easily try it out via a POC? Resist the urge to customise the technology as much as possible – this leads to cost and time delays and often is linked to technical failure.

REFERENCES

This paper has canvassed several subjects which relate to its core purpose and developed both strategic and tactical perspectives in achieving the objectives which were set out for it. The following resources have been referenced in the development of this paper, and we recommend these to readers to provide more detailed information on some specific topics and additional perspectives on others.

Organisation	Reference	Resource Link
BBVA	The five V's of big data	https://www.bbva.com/en/five-vs-big-data/
IDC	Digital Universe in 2020 Study	https://www.cs.princeton.edu/courses/archive/spring13/cos598C/idc-the-digital-universe-in-2020.pdf
MIT Sloan Review	What Managers Need to Know about Data Exchanges	https://sloanreview.mit.edu/article/what-managers-need-to-know-about-data-exchanges/
Deloitte	Data Ecosystems	https://www2.deloitte.com/content/dam/insights/us/articles/4603_Data-ecosystems/DI_Data-ecosystems.pdf
PwC	Putting Value on Data	https://www.pwc.co.uk/data-analytics/documents/putting-value-on-data.pdf
Accenture	Dawn of the Data Marketplace	https://www.accenture.com/_acnmedia/PDF-85/Accenture-Western-Digital-Value-of-Data-Dawn-of-the-Data-Marketplace.pdf#zoom=50
BSI	Smart Cities Guide for Sharing Data	https://www.bsigroup.com/en-GB/about-bsi/media-centre/press-releases/2017/april/Smart-cities-guide-for-sharing-data-and-information-launched/
Harbr Ltd	Third Party Data Management Strategy	https://www.harbrdata.com/wp-content/uploads/2020/09/third-party-data-management-strategy.pdf
Eckerson Group	The Rise of Data Exchanges	https://www.harbrdata.com/wp-content/uploads/2020/10/101220_Data_Exchanges_Harbr.pdf
Harbr Ltd	Data Marketplace Decision Guide	https://www.harbrdata.com/wp-content/uploads/2020/09/data-products-through-data-marketplace.pdf
UK Government (HM Treasury)	The Economic Value of Data	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/731349/20180730_HMT_Discussion_Paper_-_The_Economic_Value_of_Data.pdf
National Infrastructure Commission	Data for the Public Good	https://nic.org.uk/app/uploads/Data-for-the-Public-Good-NIC-Report.pdf
UK Government	National Data Strategy	https://www.gov.uk/government/publications/uk-national-data-strategy/national-data-strategy
ACS	Privacy in Data Sharing: A Guide for Business and Government	https://www.acs.org.au/insightsandpublications/reports-publications/privacy-in-data-sharing.html

ABOUT CIVIC ANALYTICA

civic relating to the duties or activities of people in relation to a [digital] place (a shared purpose)

analytica relating to or using [data driven] analysis and logical reasoning

Civic Analytica is a specialist provider of **digital advisory and data exchange services**. Our mission is to democratise the power of digital assets by helping industry, government and third sector organisations to create, grow and leverage Data Ecosystems as communities of shared purpose through building Culture, establishing Control, and facilitating Collaboration to create value.

SERVICES & PLATFORM-AS-A-SERVICE

As well as offering a suite of complimentary services to your Data Exchange program, our service portfolio includes a Collaborative Data Exchange Platform-as-a-Service used by many of the world's largest data producers and their ecosystems. The platform brings people, data and tools together to support a successful and collaborative Data Exchange program that creates collective and cumulative value.



The PaaS incorporates advanced, secure and massively scalable, GDPR compliant capability available to organisations and their ecosystems as an isolated environment on an existing instance in a matter of days, or as a "private-label" instance branded and deployed specifically for each client ecosystem within a few weeks.

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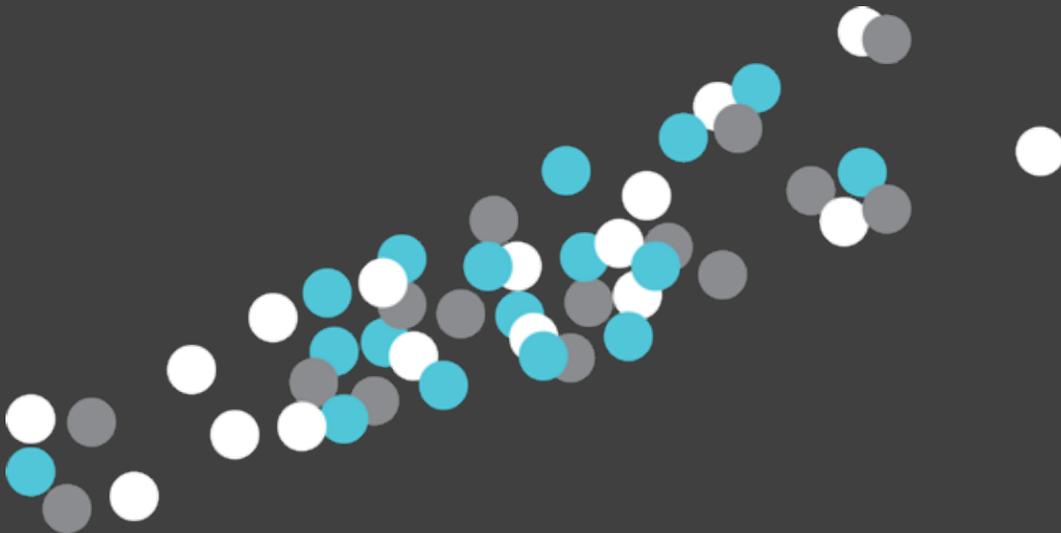
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Data for Good