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## Business Model Types for Data Trustees

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# Business Model Types for Data Trustees

## Research Paper

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**Abstract.** EU regulations and business result in a growing awareness of the benefits of inter-organizational data sharing. However, data sharing is often hindered by obstacles such as potential data misappropriation and perceived risks that outweigh possible benefits. One mitigation strategy is using a data trustee – a neutral data intermediary – that addresses these challenges and ensures secure and trusted data sharing. These data trustees uphold the rights of the data provider and give the data user legal assurance and clarity about what they are allowed to do with the data they obtain. Data trustees are still a novel phenomenon, and only a few are operating in the market. In our paper, we shed explore the characteristics of data trustees through a business model lens.

**Keywords:** Data Trustee, Data Trust, Business Models, Data Sharing

## 1 Introduction

Sharing data between organizations can be a powerful engine for business model (BM) innovation (Wixom et al., 2023). Data has developed from a mere business necessity to a strategic asset (Legner et al., 2020). Subsequently, it seems sensible for organizations to tear down their data silos and engage with potential complementors in generating new value. Using a pool of shared data is often perceived as a major driver for competitive diversification (Goasduff, 2021). From a business perspective, data sharing is a potential success factor and advantage for companies, and depending on their relative value, they contribute to different mechanisms of achieving competitive advantages (Kugler & Plank, 2021). Yet, most organizations have significant concerns when sharing data rooted in a distrust of the data user or data intermediaries and a sense of loss of control over their data (Fassnacht et al., 2023; Jussen et al., 2023b).

Against this background, a relatively new type of data intermediary – the *data trustee* – has emerged as a mediating agent organizing data sharing on behalf of a data provider with a distinct focus on upholding their data sovereignty (Stachon et al., 2023).

For instance, the Bundesdruckerei (2024) operates the *CenTrust Data Platform*, which offers multiple services for data providers, such as *anonymization*, *pseudonymization*, and a highly secure *data infrastructure*. Another example is the neutral data trustee TÜV Rheinland (2023), who operates the *Trusted Data Center* to manage automobile data flows and make them accessible to fleet operators.

New EU legislation, such as the Data Governance Act (DGA) or the Data Act (DA), provides a legal framework for data sharing in the EU (Jussen et al., 2023a), making the data trustee ever more relevant. For instance, The DGA underlines the need for trust in data sharing as “*necessary to increase trust in data sharing by establishing appropriate mechanisms for control by data subjects and data holders over data that relates to them*” but also the need for data intermediation services as they are “*expected to play a key role in the data economy, in particular in supporting and promoting voluntary data sharing practices*” (European Commission, 2022). Subsequently, the data trustee is at the verge of becoming a highly valuable data intermediary both for addressing organizations’ concerns about data sharing and orchestrating data intermediation services.

Data trustees require business models gaining them long-term success – an aspect that the current literature does not focus on. Stachon et al., (2023) identified several characteristics of data trustee BMs on an abstract level and carved out three BM types: *for-profit*, *non-profit*, and *governmental*. In our paper, we use these three BM types as a starting point and explore the characteristics of each of them in detail. This results in the research question: “*What are the characteristics of common business model types for data trustees?*”

In response, we analyzed the broad landscape of data trustees currently operating in the market with the aim of creating a shared understanding of the building blocks and components of data trustee BM types. We used the taxonomy of Stachon et al. (2023) as the starting point for analyzing and structuring the acquired information of data trustees and extended it with the BM perspective using the V<sup>4</sup> model of Al-Debei and Avison (2010). The V<sup>4</sup> model – as opposed to more detailed business model ontologies such as the Business Model Canvas (BMC) – gives us the freedom to explore data trustee building blocks in a proven frame of reference without the constraints of too many predefined elements.

The remainder of the paper is structured as follows: First, we outline and characterize the data trustee concept, followed by a definition of a business concept and the V<sup>4</sup> model. Then, we illustrate our research approach and present our findings. Finally, we provide an evaluation of the contribution to research and practice, as well as discuss the limitations and a future research outlook.

## **2 Theoretical Foundation**

### **2.1 Data Trustees**

Data intermediaries facilitate data sharing in socio-technical data sharing networks – so-called *data ecosystems* – and can be instantiated in a variety of ways, i.e., as data

marketplaces, service providers, or data trustees (Oliveira et al., 2019; Jussen et al., 2024a). Depending on the specifics of the data ecosystems, data intermediaries can be adjusted and serve a variety of purposes (Schweihoff et al., 2023a). Janssen and Singh (2022) define the data intermediary as a mediator between data providers and data users. There are different opinions in the literature as to whether and how data intermediaries and data trustees are different. Some publications see data intermediaries and data trustees as equivalent terms (Micheli et al., 2023), while others see data trustees as a category of data intermediaries (Richter, 2023; Carovano & Finck, 2023). In this paper, we adopt the understanding that data trustees are an instance of data intermediaries.

Companies still hesitate to share their data. A prominent reason for this is the lack of trust regarding data security and handling of (sensitive) data and losing control of their data (Opriel et al., 2021; Fassnacht et al., 2023; Jussen et al., 2024b). Trust is characterized by *“the willingness of an entity (i.e., the trustor) to become vulnerable to another entity (i.e., the trustee). In taking this risk, the trustor presumes that the trustee will act in a way that is conducive to the trustor’s welfare despite the trustee’s actions being outside the trustor’s control”* (Schilke et al., 2021, p. 240f.). The dual nature of data sharing complicates data trust. Not only does the data provider have concerns regarding the use of their data, but the data user must be assured as well that the data they receive is eligible for use. To accommodate legal, organizational, and ethical requirements *data trustees* can provide appropriate governance structures and facilitate *“a relationship between trustor and trustee in which the trustor relies on the trustee based on a given criterion”* (Rouhani & Deters, 2021, p. 2).

The Open Data Institute defines a data trustee as *“a legal structure that provides independent stewardship of data”* and Radovesic et al. (2023) consider data trustees as a *“relatively new type of data governance model.”* Carovano & Finck (2023) see a data trustee as a provider of *“fiduciary data stewardship on behalf of data subjects.”* There is no standard definition for data trustees, but there are characteristic attributes that can be used to differentiate the construct (Blankertz & Specht, 2021a; Stachon et al., 2023). To realize its full potential as a data trustee, it is necessary to be perceived as trustworthy (Blankertz & Specht, 2021b). The data trustee’s responsibilities include the transfer, management, and processing of data for the involved parties. Another core function is compliance with legal regulations (e.g., data protection) (Micheli et al., 2023; Radosevic et al., 2023). Depending on the use case, the data trustee establishes trust-promoting mechanisms that also have a value-creating function (Blankertz & Specht, 2021a). Data trustees act as neutral authorities with the purpose of securely regulating the access and use of the data available. This means that data trustees are loyal to the data providers and data users without having conflicts of interest or further dependencies on the actors (Micheli et al., 2023). They can anonymize data, for example, and track all data requests (Radovesic et al., 2023).

## 2.2 Business Models

BMs are a *“conceptual instrument”* that outlines the financial and organizational structure of a company (Osterwalder 2004, p. 14). A BM describes how a company

“creates and delivers value to customers” (Teece 2010, p. 173). Typically, BMs cover a range of ontological elements, spanning from value proposition, customer segments and relationships, cost structure and profit model to key resources and activities (Linder & Cantrell, 2000; Timmers, 1998; Osterwalder & Pigneur, 2010; Al-Debei & Avison, 2010). The increased value of data spurred new types of BM, such as data-driven BMs and data-sharing BMs (Bärenfänger & Otto, 2015; Hartmann et al., 2014; Schweihoff et al., 2023b). In particular, the design of BM for the shared use of data is a relatively new topic area (Schweihoff et al., 2023b), which means that the design of BM for data sharing, especially for data trustees, has received little attention in the literature to date.

To address the growing design options for business models and the resulting complexity and uncertainty, appropriate instruments for analyzing the core logic and value creation activities of the business model can be used (Schoormann et al., 2023). There are various ways in which BMs can be described conceptually in the literature (Szopinski et al., 2022). These include the BMC (Osterwalder, 2004), the VISOR model (El Sawy & Pereira, 2013), and the V<sup>4</sup> model (Al-Debei & Avison, 2010). The BMC, which classifies a business model according to nine essential building blocks, is a conceptualization tool for business models that is equally accepted and widespread in both research and practice. All the elements can be categorized into the four V<sup>4</sup> business model dimensions. The four-dimensional categories are especially suitable for mapping data-driven business models where the key resource and central role in the value architecture is data (Strahringer & Wiener, 2021).

The V<sup>4</sup> model comprises four interdependent dimensions for systematizing a BM. The *value proposition* reflects the products and services as well as all value-creating elements, including the addressed market segments and their preferences. The *value architecture* presents a holistic overview of the organizational structures. In addition to resources and core competencies, tangible and intangible organizational assets are included. The *value network* includes both inter-organizational and cross-company collaborations involving multiple stakeholders. The positioning of the organization and its relationships with each other in the value network is examined in more detail. *Value finance* refers to cost structures, income streams, and pricing methods (Al-Debei & Avison, 2010).

We define data trustees as data-driven business models and use the more compact representation of the V<sup>4</sup> model to conceptualize the business models. This allows us to ensure that our work is in the conceptual scope of business models but is more freely operationalized than it would be in the more detailed BMC.

### 3 Research Design

To address the research question and to provide a comprehensive overview of data trustee BMs, we conducted an initial review of all the available information in the field and developed a six-phased research approach.

**Phase (1) – Review Scientific and Gray Literature:** At this point of our research, we screened the available literature and conducted a narrative review (Paré et al., 2015). This was necessary, since the academic literature on data trustees is in its infancy and

a systematic review is, hence, impractical. After the initial screening, we opted to only include the few papers we found (e.g., Stachon et al., 2023 or Lauf et al., 2023) and delay a systematic review until the body of literature is more mature. We enriched the body of data by screening the web for gray literature (e.g., Specht-Riemenschneider & Kerber, 2022 or Blankertz & Specht, 2021a).

**Phase (2) – Public Data Analysis:** Consequently, we turned to publicly available data on data trustees on the market. In BM research, this is a sensible strategy since many organizations provide ample information about their BMs – what *they do* and sometimes what *they charge for* it – transparently (Teece, 2010). For this purpose, we searched databases like Crunchbase and Google Search using keywords such as “data trustee”, the German equivalent “Datentreuhänder”, as well as the synonyms “data trust exchange” and “trusted intermediary”, especially to find private-sector companies (e.g., *Data Trustee GmbH* or *TÜV Rheinland*). Due to the novelty of the phenomenon and to examine the broadest possible range of data trustees, all actors available in the initial screening of the companies’ websites that matched the searched keywords were included. The number resulted in 47 available organizations, mainly located in European countries, for example Germany, Austria, or USA, e.g., *Yale University Open Data Access*, as well as Canada, e.g., *Data Sentinel*.

**Phase (3) – Iterative Data Analysis:** We constructed and analyzed the database by continuously matching and evaluating the examples collected by two authors with the definition of a data trustee from Stachon et al. (2023). From the initial sample of 47 data trustees, we had to exclude a few because of a lack of information (e.g., *bitsabout.me* or *TÜV Süd*). Nor could we include data trustees that are out of business, as they did not have a viable stand-alone BM (e.g., *LunaDNA* or *DataCoup*). The final database encompassed 34 data trustees, whose information was acquired primarily from their websites or blogs, as well as reports on the companies in newspapers.

**Phase (4) – Classification:** For a systematic classification and analysis, all data trustees were categorized according to the dimensions of the taxonomy by Stachon et al. (2023). The selected taxonomy is the only available classification schema of data trustees in the research literature to date. For us, it serves as a basis for the investigation of data trustees, as it can be assumed that similar actors were identified and investigated in accordance with the research design of the taxonomy. Additionally, we added further characteristics that we found to be relevant for BMs but were not covered in the taxonomy (e.g., community building). These are highlighted in bold in Tables 2 and 3.

**Phase (5) – Frequency Analysis and Correlation:** As a next step, we determined the frequency of occurrences for each characteristic in relation to the total number of all data trustees in the subcategory. The coding was non-exclusive: for example, *Data Trustee GmbH* pseudonymizes, encrypts, and, in some cases, anonymizes personal data. As a result, it is possible to determine which attributes are complied with in the BM in relation to the total number in the target group.

**Phase (6) – Characterization of the Business Models:** We used the V<sup>4</sup> model to structure the characteristics of the data trustee BMs (see Section 2). By classifying the characteristics of the various organizations in the V<sup>4</sup> model, an inductive elaboration of the similarities between the business models was carried out, with the result that all actors were assigned to one of three categories.

## 4 Findings

### 4.1 Overview

In Table 1 we summarize and describe our classification of the data trustee BM types.

**Table 1.** Description of the data trustee BM types

BM Type	Description
For-Profit Data Trustee	A market-oriented perspective characterizes the BM. With an accent on a financially viable and feasible BM that competes on the market through data trustee value-added services. The customer base predominantly encompasses private-sector companies. A particular focus is on monetization of data providers.
Non-Profit Data Trustee	The design of the BM has a societal emphasis, similar to the governmental data trustee, but is differentiated by its diverse customer base, including a focus on financial and customer data, as well as the monetized support services provided. A particular focus is on community building.
Governmental Data Trustee	The BM has a distinct social focus, making the data trustee naturally a trustworthy entity that is often funded by the government and maintains partnerships with research institutions and universities. In contrast, the service offering is rather basic and the access to the data and platforms is for free.

After classifying, structuring, and expanding the characteristics and dimensions using the taxonomy of Stachon et al. (2023), we incorporated them into the V<sup>4</sup> model. In this way, similarities and differences between the BM types became apparent. Table 2 and Table 3 show the frequency analysis of the three BM types we discuss below.

**Table 2.** Business model characteristics for the value network and value finance

			For-Profit Data Trustee	Non-Profit Data Trustee	Governmental Data Trustee
Value Network	Data Provider	Individuals	83%	67%	31%
		For-Profit Organizations	58%	83%	56%
		Governmental Organizations	25%	67%	88%
		Non-Profit Organizations	0%	50%	75%
	Data User	Individuals	25%	33%	6%
		For-Profit Organizations	100%	67%	63%
		Governmental Organizations	50%	100%	94%
		Non-Profit Organizations	33%	67%	88%
Value Finance	Data Sharing Incentives	Received Service	67%	50%	25%
		Social Good	0%	67%	69%
	Revenue Model	Access Fee	33%	0%	0%
		Free	0%	67%	56%
		Service Fee	8%	33%	6%
		Pay-Per-Use	8%	17%	13%
	Revenue Source	Data Provider	50%	33%	0%
		Data User	50%	67%	13%
		Governmental Funding	8%	33%	81%

**Table 3.** Business model characteristics for the value architecture and value proposition

			For-Profit Data Trustee	Non-Profit Data Trustee	Governmental Data Trustee
Value Architecture	Data Type	Personal Data	92%	83%	75%
		Customer Data	83%	33%	25%
		<b>Financial Data</b>	50%	33%	25%
		Company Data	33%	17%	6%
		Health/ <b>Clinical</b> Data	25%	83%	81%
		Research Data	17%	67%	63%
		<b>Social Data</b>	8%	0%	38%
		Governmental Data	33%	17%	31%
	Data Source	<b>Individuals</b>	58%	67%	63%
		<b>Companies</b>	50%	50%	25%
		Local Data Sources	17%	33%	69%
	Data Security	Encryption	75%	67%	31%
		Anonymization	58%	50%	31%
		Pseudonymization	17%	0%	50%
	Trust Signaling Mechanisms	Trusted Technology	67%	50%	31%
		Domestic Data Center/ <b>Trust Platform</b>	58%	100%	56%
		Trusted Certifications & Licenses	42%	33%	25%
		Customer Reputation	33%	0%	6%
		Trustworthy Cooperation Partners	25%	67%	44%
		Governmental Support	0%	17%	38%
		Data Trust Reputation	8%	17%	50%
Value Proposition	Access Authorization Management	Individual Data Provider and/or Data User Consent	67%	67%	69%
		Individual Data Set Consent	33%	50%	25%
		Forwarding Reason	8%	33%	44%
	Data Preparation	<b>Data Storage/ Organization</b>	58%	50%	44%
		Data Aggregation	50%	17%	44%
		Data Standardization	17%	33%	44%
	Value Added Services	Data Management	67%	33%	38%
		Data Analysis	67%	67%	63%
		Aggregated Data Visualization	58%	50%	56%
		Trained Models	58%	17%	19%
		<b>Client Software or Apps</b>	33%	0%	25%
		Consulting and <b>Data Support</b>	8%	33%	19%
		Data Quality Management	42%	0%	38%

Some characteristics emerge so frequently that they build the foundation for data trustee BM types. In all BM types, the data trustee is a governance authority at the center of a multi-sided data ecosystem. It is always a neutral, trusted data intermediary in value-creating data-sharing activities. Unsurprisingly, all data trustees – naturally – comply with data protection legislation. A particular instance is sharing sensitive data, as 80% of our sample of data trustees work with personal data. Primarily, they organize data sharing via an upload interface or by being manually triggered. On the data's side, data is received by downloading upon request. Next to requesting consent for data sharing and data use, some data trustees provide additional services around consent and identity management so that the users are verified in the stakeholder network.



## 4.2 For-Profit Data Trustee Business Model Type

The private sector data trustees include 12 businesses. The **value network** comprises data providers, with 83% being individuals (e.g., *citizens and company service consumers*) and 58% being other private companies (e.g., *financial, insurance, healthcare*). Data users include for-profit organizations like media groups or fleet operators, public institutions such as universities, non-profits organizations, and individuals like lawyers or tax consultants. Partners often include trust-promoting entities (e.g., *data protection authorities, IDSA*), financial supporters (e.g., *ventures, capital partners*), technology-enabling, or promoting data trustee reputation (e.g., *IBM or Microsoft*).

Revenue sources for **value finance** comes equally from data providers and consumers, who pay an access fee. The incentive for data sharing is the service provided by the data trustees.

Within the **value architecture**, for-profit data trustees focus on key industry data types, primarily personal and customer data, followed by company-related and financial data. Consequently, data is usually generated by individuals or companies. Security measures include encryption and anonymization. Mechanisms used to promote trust include trust-enhancing technologies and dedicated platforms. Certifications (e.g., ISO27001) or licenses are common, as well as trust-building customer reputations.

Data trustees' **value proposition** includes regulating data access for data users', but also ensuring monitored and recorded data movements with sufficient transparency. The most common method (67%) is individual tracking, allowing data providers to see which users accessed their data. Alternatively, a general indication can follow so that a publicly available visualization of data access is provided. Among for-profit data trustees, 42% support data providers monetize their data, and offer data management, analysis, and aggregated visualization services.

**Illustrative Example:** *Data Sentinel* (2024) is a for-profit data trustee that provides a platform for especially sensitive data. Companies such as insurance companies, legal firms, and individuals (e.g., consumer data), as well as higher education and the healthcare sector, share data. Among these are sensitive personal information, judicial data, public data sets, and research data. All data is stored centrally at Data Sentinel and comes from various sources such as payment systems, doctors, and company information systems. In order to gain access to the data, the data trustee obtains individual consent for the relevant data set and records and monitors all access so that each data provider can see who has had access to the data at any time. The data trustee provides a comprehensive service for preparing the data, and classification and standardization are conducted. The focus of Data Sentinel is on the automation of compliance, data remediation, and data auditing as a service, among others. The company secures its funding through access fees collected from data consumers and has partnerships with additional capital providers (e.g., *Sentiero Ventures*).

#### 4.3 Governmental Data Trustee Business Model Type

There are 16 governmental data trustees. In the governmental BM **value network**, data is predominantly shared between governmental institutions or non-profit organizations, such as research institutions, government authorities, and universities.

**Value finance** incentivizes data sharing through trustees in value-generating input for public welfare and social good. Government funding and subsidies ensure the financing of the data trustee, while the access to the platform and services is free.

Data security is a key aspect of the **value architecture**, involving pseudonymization. Data sources include local storages (e.g., doctors, hospitals) or individuals. Common data types are health, clinical study, often linked to personal records, and research data. This architecture includes mechanisms to build trust among network actors, primarily through secure platforms or data centers, while public data trustees rely on their reputation for trust.

The **value proposition** of governmental data trustees covers data storage, organization, standardization, and aggregation. Trustees regulate access by obtaining individual consent from data providers and users or by specifying the data transfer purpose. While value-added services are less extensive than those of for-profit trustees, emphasis is placed on data analysis and aggregated visualization.

***Illustrative Example:*** The *Bundesdruckerei* (2024) has established the CenTrust platform, which is a neutral, intermediary, privacy-compliant data trustee. The primary purpose is to position itself as a trust service that shares pseudonymized (e.g., health data), anonymized, and encrypted data. Other data types include customer data, judicial data, and governmental or research data. As the platform is government financed, it is used as a vehicle to promote trust in its reputation and credibility as a German governmental organization with a platform that is DGA-compliant.

#### 4.4 Non-Profit Data Trustee Business Model Type

There are six non-profit data trustees. Unlike the governmental model, their **value network** includes for-profit organizations, public organizations, and individuals (e.g., social enterprises, charities, co-operatives, initiatives, research institutions) who share data. Notably, 67% of non-profit trustees emphasize community building.

Within **value finance**, data is consumed mainly by public entities. While the primary motivation for data sharing is social good, the trustees' services add appeal. Access to data is free in 67% of cases, though some BMs charge service fees or Pay-Per-Use fees for supportive activities and services. Revenue comes from data users, providers, and government funding, with data users often being billed if fees apply.

The **value architecture** covers personal, financial, health, and research data from individuals, companies, and local repositories. Data security is ensured through encryption or anonymization. Trust is built through proprietary platforms or domestic data centers and represent the most significant trust-building mechanism. Additional trust-building efforts include partnerships and technologies.

In the **value proposition**, non-profit trustees regulate access via agreements with data providers or consumers, individual authorizations, or specifying the data users'

reasons for access. They offer basic data storage, organization, and also data standardization, along with data analysis, management, and consulting services.

**Illustrative Example:** The non-profit organization *Vivli* (2024) is an independent, global platform for the sharing of data and data analysis. The focus is on individual patient data from clinical studies. The data trustee acts as a neutral broker between the data users and emphasizes mechanisms that promote the data-sharing community. The company anonymizes data from clinical studies and focuses on data security. Access to data on the Vivli Platform is free, but Vivli Service charges data users exclusive access to its secure research environment. The social focus of the company is to propose only fundamental services of data management, aggregated data visualization, and data analysis.

## 5 Discussion and Limitations

The three data trustee BM types, non-profit, for-profit, and governmental, provided a starting point for examining the viability of data trustee BMs. With our research, we contribute an empirical underpinning to these BM types by evaluating organizations in the market. For practical implementation, we provide a framework that can be used for orientation as well as to develop, position, and establish data trust models within the data ecosystem to ensure secure and sovereign data sharing.

Although the general function of data trustees remains the same across the BM types, we found that the BM types differ according to the objective and purpose they pursue. For-profit data trustees naturally differentiate themselves from the other two models. In fact, their focus is to develop a viable, market-ready BM to operate as a data trustee while still generating revenue and separating themselves from the competitive environment with the services they offer. By contrast, the other two data trustee BM types focus on the social component as an incentive for data sharing. Consequently, governmental data trustees emphasize other fundamental characteristics, for example, health data, government funding, or free access to data trustee platforms and services. Non-profit data trustees operate in-between and have characteristics of both other types. Although their BM is driven more by social incentives and, thus, the design leans more towards governmental data trustees, they can be still classified as a distinct type of data trustee. Financing, for example, is ensured by many sources, while the model is usually provided for free. In some cases, financing options such as service fees and pay-per-use are also available. Table 4 provides a summary of our findings across the four dimensions of the  $V^4$  model and the three data trustee BM types.

It is important to note that the success of data trustees in the market is not solely based on their main features of security and transparency but also on the services they provide. However, individuals who use data trustees to protect their personal data and incidentally sell data are the main data providers for most non-governmental organizations. However, the services offered by data trustees are mainly aimed at other organizations that use the acquired data. These services include the preparation, analysis, and visualization of big data, as well as the training of AI models, which is essential in all market sectors today.

**Table 4.** Overview and classification of the data trustee business model types

	For-Profit Data Trustee	Non-Profit Data Trustee	Governmental Data Trustee
Value Network	The consuming entities are other companies, while the data is provided by individuals or privately owned companies	Data providers are very diverse, mainly companies, but also individuals and public organizations <u>Support community building</u>	Tend to share data between the public entities but also between non-profit and private businesses.
	<ul style="list-style-type: none"> <li>Stakeholders who are interested in data sharing</li> <li>Data trustee acts as a governance authority – a neutral, trusted data intermediary</li> <li>Data can be transferred through a download, or via request from the data provider to the data trustee and provided to the data receiver through an upload or by being manually triggered</li> </ul>		
Value Architecture	Share data that will benefit their network participants the most-personal data, customer data or financial data Rely primarily on trust-promoting technologies and provide support with (e.g., blockchain technologies, encrypted connections or SaaS) Certifications or licenses (e.g., ISO27001) are also a trust mechanism	Customer and/or financial data	Data sources are besides individuals also local data providers (e.g., doctors or hospitals) Natural reputation that fosters trust and confidence
	Primarily health and clinical data or research data Focused on the societal intent as a trust mechanism Partnerships are intended to promote trust (e.g., university and public institutions or research institutes)		
	<ul style="list-style-type: none"> <li>Sharing of sensitive data – personal data</li> <li>Place emphasis on establishing a trust-enhancing platform or data center</li> </ul>		
Value Finance	Are primarily driven by financial goals and aim to generate revenue by offering a wider range of services and charging access fees for data users or/and data provider Support monetization of data provider	Demand compensation (e.g., service fee) if support services are used Diverse sources of income (e.g., data user, government, fees)	Often governmentally funded Few services, but they are free of charge
	Grant free access to their data and/or platforms Incentives for data sharing are socially driven		
Value Proposition	Offer several services and provide additional microservices (e.g. data banking) Services range from data management to data analysis and the use of AI models. In addition, they often offer their own software or apps to supplement the services or to provide continuous access to the data	Differentiate themselves by also offering consulting services and support	Incorporate data quality management
	Have the same services that are predominantly offered, such as data analysis, aggregated data visualization, or data management In some cases, access to the data requires a specific, legitimate reason that must be specified by the data user in order to obtain the data.		
	<ul style="list-style-type: none"> <li>Compliance with data protection legislation (e.g., GDPR)</li> <li>Consent management</li> <li>Identity management</li> </ul>		
Sample	Data Sentinel, Data Trustee GmbH, idento.one, TÜV Rheinland, IBM & Mastercard – Truata, DRACoon, Apheris, Polypoly, itsmydata, Complero, ODE Infinity, DataVillage	Mydex, Data for Good Platform, JoinData, MIDATA Genossenschaft, Project Data Sphere Initiative, Vivli	Nortal - Vertrauensstelle nach § 299 SGB V, Westdeutsche Biobank Essen, Bundesdruckerei Plattform CenTrust, THS Greifswald, Racoon, Greater London Authority/London DataStore, World Data Exchange/digi.me, Findata, Clinical Study Data Request Program, Consumer Data Research Centre, Data and Analytics Facility for National Infrastructure, Djust Connect, Grampian Data Safe Haven, OpenSafely, The Genomic Data Commons/National Cancer Institute, Yale University Open Data Access

Furthermore, for-profit and non-profit organizations must ensure the security of their platforms through advanced technologies and security certificates. In contrast, governmental data trustees rely on their reputation as a secure source. Nevertheless, it is typically transparent which security technologies are used in these organizations.

The novelty of the topic implies that the current documented structure for the data trustee BM could already find other alternatives in the near future. This is a limitation on highly innovative topics that are subject to rapid, dynamic developments: data trustees may soon undergo BM developments, or newer approaches to BMs may enter the market and shift the current picture we developed. Further, the collection and structuring of data from publicly available sources is naturally subject to bias by the participating authors.

## **6 Contributions and Outlook**

In this paper, we address the question of archetypical BM for data trustees. With our research, we expanded this novel thematic area of data intermediation and contribute concrete knowledge through observations from practice. We detail BM types for-profit, non-profit, and governmental data trustees and discuss their specificities.

Our research can provide a starting point for further research. We only showed a selection of characteristics for the three identified BM types. The characteristics can be analyzed more deeply in future studies and explored with new methods. For instance, we focus on empirically exploring BM types, which could be used for theorizing using methods such as qualitative comparative analysis or cluster analysis. Particularly, it could be interesting to extend the underlying database with qualitative interview data, which could provide richer insights into the practice of data trustees.

In addition, in the process, we noticed that the employed taxonomy of Stachon et al. (2023) could potentially be further refined and used as a coding scheme to cluster archetypes of data trustees, eventually hinting at furthermore fine-granular BMs or even novel BM (sub-)types. In addition, case studies based on BM types are also conceivable to work out in detail how BMs for data trustees can be developed. This would allow us to make data trustee BM more usable for the industry. Lastly, the processes for data sharing among the data trustees have not yet been scrutinized in a structured fashion. The derivation of process patterns for sharing, brokering, and using data could assist in building trust in these novel intermediary services and better operationalize the services with the data providers and consumers – potentially leading to even further BM for data trustees.

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