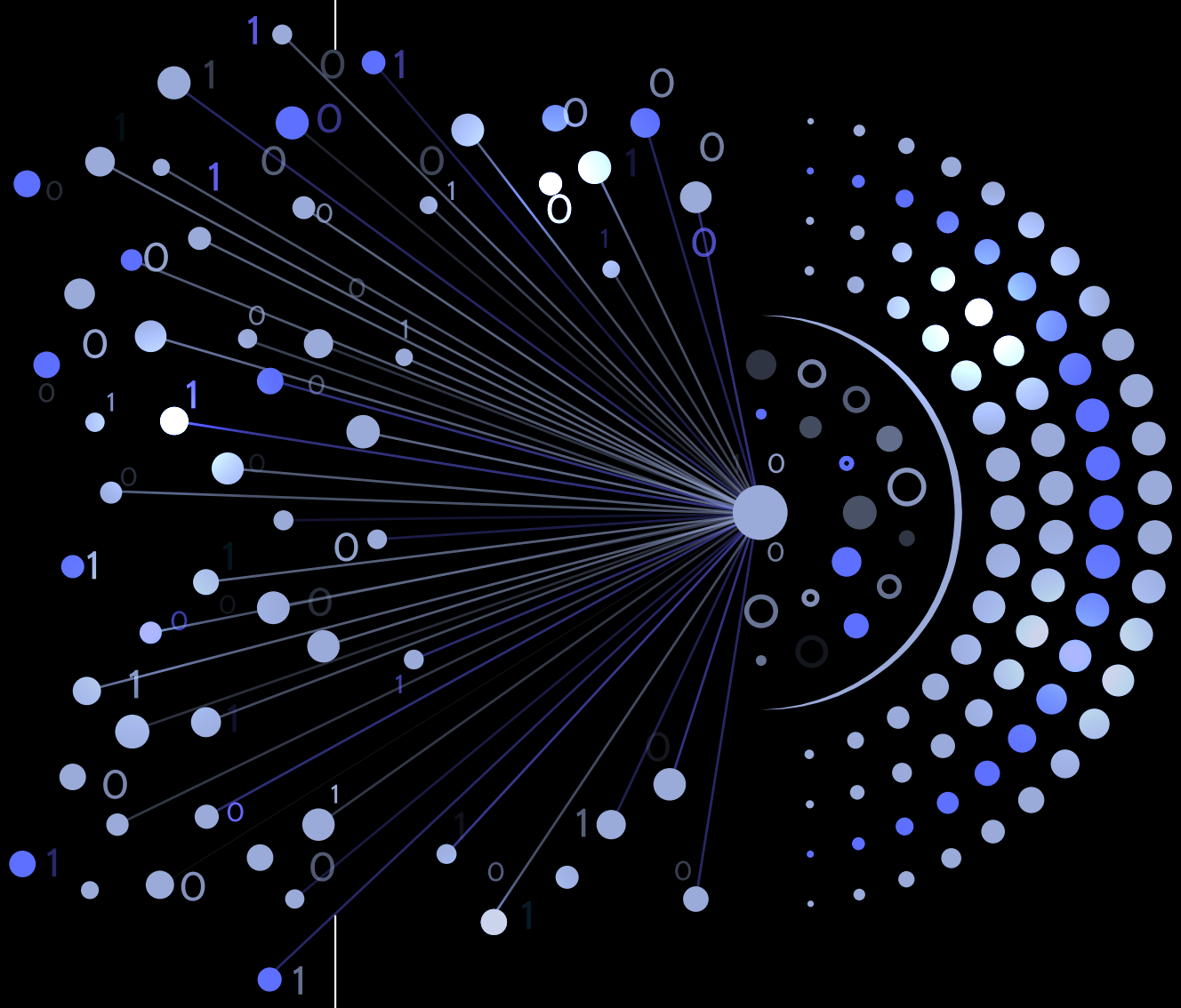
● Whitepaper

Unlock the Power of Quality Data with Data Unity



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Introduction

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Data Challenge in a Modern Business Landscape

Despite the popular expression, today it might be more accurate to say that data makes the world go round. Last year, an estimated 149 zettabytes of data was created, captured or copied - equivalent to 29.8 trillion high-definition films.

According to research by the International Data Corporation, the creation of new data shows no signs of slowing either, with predictions forecasting it to double every four years. This should come as little surprise, as every website visit, every social media post, and every single step tracked by your smartphone's GPS leads to the creation of more data.

But for all the benefits data has unlocked, its sheer scale also presents challenges. The volume of data produced today means that fragmentation and duplication must be constantly guarded against. It's time data cleared up its act.

The Importance of Quality Data

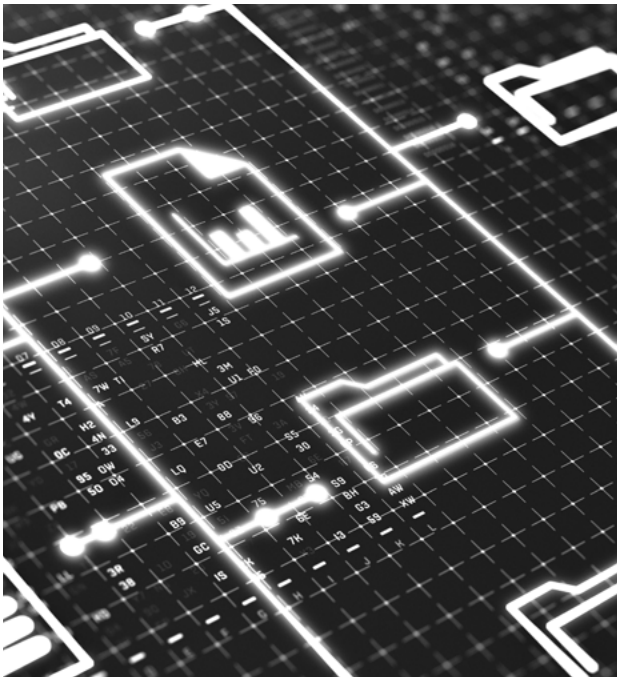
The insights that can be derived from a piece of data will only be as good as the data itself. Unfortunately, for too long organizations have faced a hard time sorting through the data to find nuggets of useful information among a much larger heap of noise. Poor quality data has real-life impact too. Gartner reports that every year, poor data quality costs organizations an average of $12.9 million.

That said, we want to acknowledge that data isn't solely associated with negative outcomes. Conversely, good quality data can deliver untold opportunities for businesses. It can boost efficiency, reduce mistakes in everything from marketing to operations, and generate competitive advantages. In short, better-quality data leads to better business outcomes.

The Causes of Poor Data Quality

Two of the major causes of poor data quality are data duplication and data fragmentation across multiple systems. **Data duplication** refers to the occurrence of multiple records for the same business entity or object within one or more data sets. **Data fragmentation** is the distribution of attributes of a business entity or object across multiple records.

A business object is a unique entity in the world that is relevant for the business. This can be a customer, a spare part, a ticket, a stock item or a document. While there is only one business object, it can be represented multiple times (data duplication) in multiple data systems (data fragmentation) in different ways (data deviation).



One of the biggest consequences of poor data quality is a breakdown of trust. Being able to work effectively with data means being able to trust the results you derive from it. When quality is insufficient, you end up with data that is not fit for purpose.

Of course, you first need to be clear on what this purpose is. What features do you consider to be important for the data to be trustworthy?

For us, we feel that to be of maximum utility, data has to be

- **Complete**
- **Correct**
- **Unique**
- **Sufficient**

Failing in any of the above areas can result in inefficiency, compliance risk, bad decisions, and missed opportunities.

However, poor data quality doesn't have to be the standard in your organization. In the following whitepaper, we'll explain how businesses can avoid data duplication and fragmentation. Taking insights from the DAMA International Data Management Body of Knowledge (DAMA-DMBOK), client testimony, and expert opinion, we'll explain how the concept of Data Unity can help you unlock the full potential of organizational data.

Data quality is the basis of data trust. And quality is achievable. Keep reading to find out how.

The Value of Quality Data – Understanding its Business Benefits and Why it‘s Important

The value that can be derived from quality data is extremely wide-ranging, being just as applicable to event ticketing systems as customer records at financial institutions. You will find many businesses facing issues with data duplication and fragmentation. Take pension systems as just one example. Here, having duplicate data or policies for a single customer creates a huge compliance issue for pension funds. At the same time, sensitive information that gets duplicated among source records represents an added privacy risk.

Empowering your decisions

Improved decision-making may be the most important benefit of quality data. If businesses have access to reliable, correct data, they can use it to inform their decisions and be more confident that they've made the correct choice. Unfortunately, many organizations do not have access to the data they need - there's too much of it, it's unordered, and it's spread across multiple systems.

A recent survey by Oracle found that even though 74% of employees and business leaders admit that the number of decisions they make every day has increased tenfold over the last three years, data isn't necessarily helping. 86% said the volume of data is making decisions more complicated, while 72% added that the sheer volume of data and their lack of trust in it stopped them from making any decision at all.

However, quality data can have undoubtedly have a positive effect. Just because data, when stored incorrectly or misused, may add complexity for some, for others it represents a goldmine of valuable information. That's why an overwhelming 97% of data leaders have claimed that their organizations have suffered consequences from ignoring data - from missing out on new revenue opportunities to making poor investments.

The benefits of data-driven decision-making are well-known - across businesses and industries. Data can contain valuable insights into customer behavior, the state of your competition, market trends, and much more. But gaining access to these insights requires more than a vast quantity of data. To ensure your data informs, rather than impedes, your decisions, your data must be correct, accessible, and clear.

From compliance to customer satisfaction

It's not just decision-making that is improved by having access to good-quality data either. Compliance is another important factor. In many cases, data is fundamental to a business' ability to meet regulator demands. This data needs to be correct or they may find themselves liable to sanctions.

There is also a customer satisfaction angle to consider. For instance, you may be a business that engages with a single customer across multiple systems - from newsletters to direct emails, to social media posts. If this is the case, it quickly becomes difficult to see what interactions your company has had with that customer. Perhaps the shipping department has a database and the marketing department has another. Without a holistic overview of your customer interactions, duplication occurs and customer frustrations can (justifiably) grow.

Using data to generate a more complete picture of the customer also delivers cost benefits. With low-quality data, there is a lot of manual work required to search, correct, and verify it. Manual work that is costly, time-consuming, and a real drain on employee productivity. Ultimately, good-quality data benefits us all: employees, management, customers, and more.

To summarize, some of the benefits of quality data for businesses are:

- It lowers operational costs
- It enhances decision-making with reliable, accurate data
- It improves customer and employee satisfaction
- It ensures compliance with data regulations
- It drives strategic growth and agility in competitive markets

Understanding Data Unity – What it is, and how it works

When organizations allow data disunity to continue, they see entities duplicated across datasets with inconsistent and unreliable attributes.

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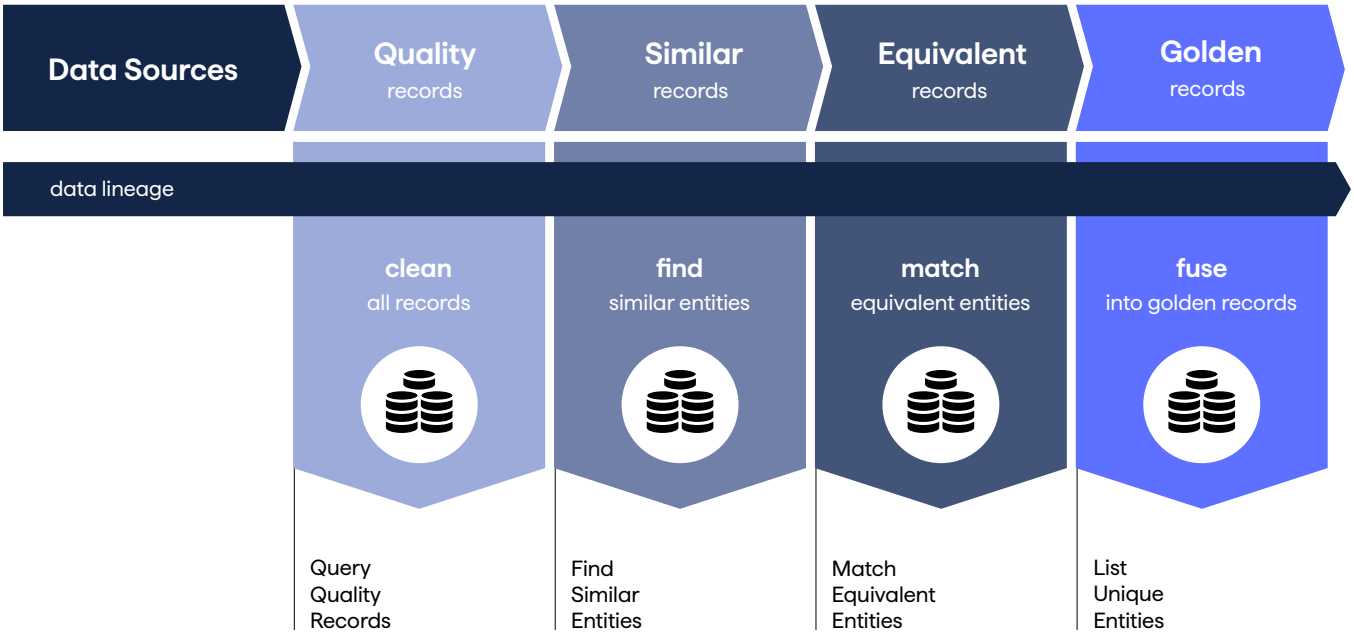
If many organizations are aware of the challenges that prevent them from making the most of their data, why do they continue to drown in the deluge? We believe it's because they are yet to fully embrace the concept of Data Unity: a solution that is able to unify your various data across all sources using advanced AI/ML techniques. We see data unity as being absolutely critical to data quality.

When organizations allow data disunity to continue, they see entities duplicated across datasets with inconsistent and unreliable attributes. Information about business objects can be present in multiple systems and different formats, which may be out of sync or outdated. Finding the most relevant and up-to-date information about a certain business object is challenging. Common challenges that arise when organizations are beset by data disunity are a failure to identify who their customers are, what products they have in stock, what assets they have, and what issues customers are currently experiencing.

Conversely, data unity leads to easy access to reliable and uniform data. A holistic view that integrates customer and asset information is created that reduces your inventory needs and streamlines operations while guaranteeing compliance with regulations and policies like GDPR.

Eraneos Data Unity

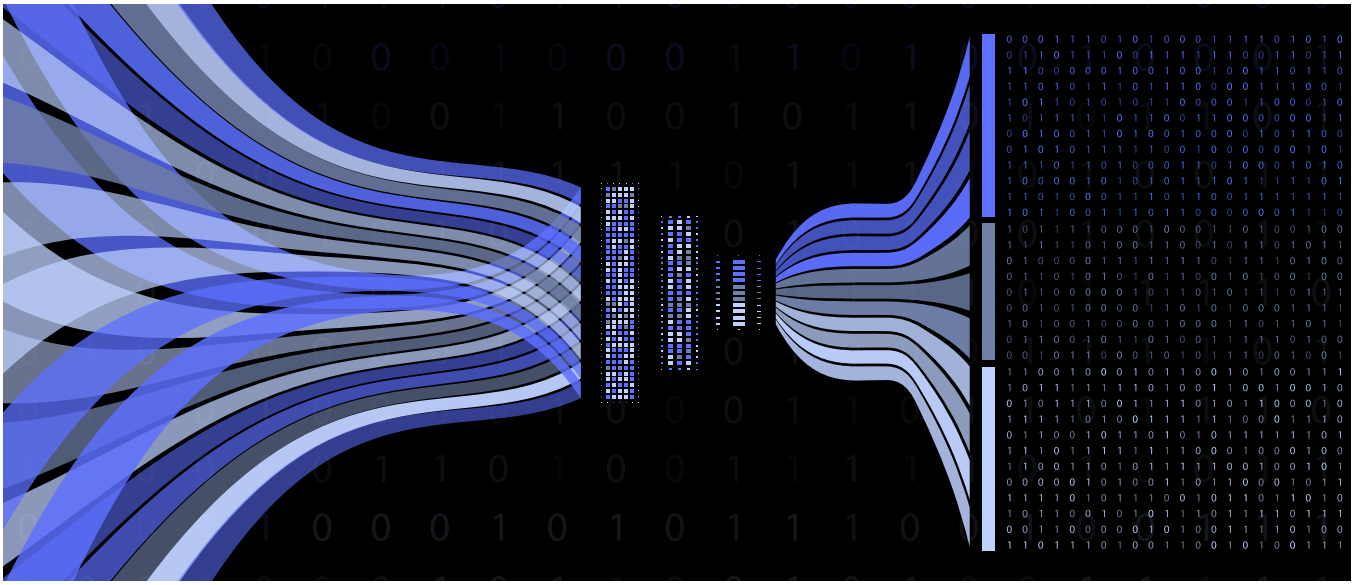


We believe there are four stages on the path to data unity: **Quality**, **Similar**, **Equivalent**, and **Golden**.

- **Quality:** The first step towards data unity is improving the quality of your data, ensuring all records are complete, correct, and well-formatted.
- **Similar:** Once your records are cleaned, it's important that organizations are able to search for similar business objects, whether they are customers, spare parts, or any other record.
- **Equivalent:** After you have a way of finding similar business objects withing your data records, it's time to define equivalencies. For example, if you are searching for a particular screw to use in the maintenance of your HVAC system, you may find one by a supplier that is the right dimensions and material but is available at a lower price compared with the vendor you usually use. It is equivalent, even if it is not the same.
- **Golden:** The final step on the road to data unity is selecting the most relevant attributes of the business object to create a Golden Record. Here, we fuse various records into a single, unique golden record, based on the criteria of quality, similarity, and equivalence.

Following the data lineage line

With a golden record, businesses also have access to a more reliable data lineage line. They can look back at where each piece of data comes from and how it was determined that what were originally separate records actually relate to the same entity. „Thus, improving explainability."



Key technologies behind data unity: AI and Machine Learning

Artificial intelligence (AI) has an abundance of applications - including data unity. One place where we are using AI in data unity is in determining similarity. The specific technology we use is vector similarity search, where we use an AI model to encode the properties of all the different records we have into a vector, before determining what the distance is in vector space between those objects. This allows us to say where one record looks similar to another. We also employ state-of-the-art machine learning techniques to process multi-modal data: images, audio, video, documents. This enables turning your unstructured data into structured data.

For each of the attributes of an object you are modeling, AI gives you a certain degree of confidence. All of these things grouped together in a weighted manner give you the total confidence to say that two records actually relate to the same entity. After determining the clusters of related records, we identify the most reliable value for each of the attributes to build the resulting golden record.

How Eraneos delivers data unity

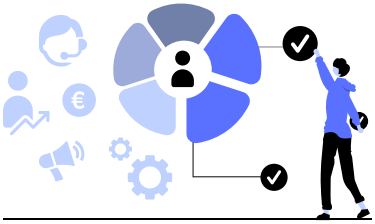
Eraneos can deliver data unity for our client on top of their own data and systems. The first step is to understand the customer's needs. What is the purpose of their data? Once this is clarified, we can carry out a proof of value test, before integrating the data unity concept into the client's processes and building functionality around data quality, similarity, and equivalence. This is distinct from us running a SaaS platform where clients can upload their data and have it cleaned and verified.

The data lineage aspect is key for setting us apart from competitor solutions. The explainability that this lineage gives clients is key. It allows us to explain exactly why data records are combined or kept separate and why specific attribute values are chosen as the most trustworthy. It also enables auditing for accounting, control, and compliancy purposes. It means our approach to data unity is comprehensible, transparent, and coherent. Ultimately, it just makes sense.

Real-World Applications of Data Unity

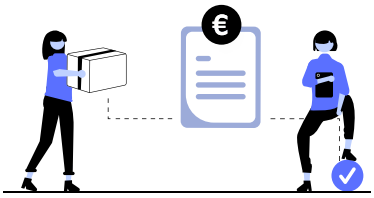
With Data Unity, you can unify all the available data from various sources using advanced AI and Machine Learning. Below, you can learn more about the main applications of the solution.

There are other real-world applications of data unity too, such as:



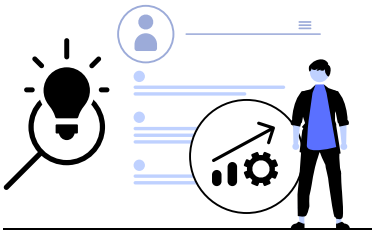
Customer Data: Golden Records

Here, the main use case arises when businesses hold their customer data across multiple databases. With our data unity platform, we consolidate this customer data into a single unique list so businesses have a holistic, 360-degree view of each customer. It's the merging of all your customer data into master records that makes it easier for organizations to deliver personalized insights.



Procurement & Tender Support

Real-world applications of data unity for procurement start with the collection of all the inventory lists of an organization's suppliers before identifying which parts are identical. This provides them with a clear view of where parts are cheapest so they can make financial savings during procurement.

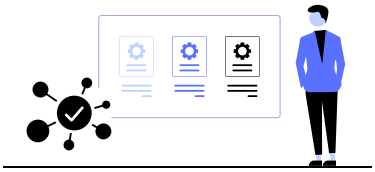


Spare Part Spend Optimization

Similarly, when businesses need to purchase spare parts for asset maintenance or upgrades. Data unity can reduce costs by unifying spare part inventories and identifying equivalents.

Distributed Stock Inventory

When businesses have multiple warehouses, each keeping its own stock, it becomes difficult to gain oversight into areas where stock is sufficient and where it is in need of replenishing. For this, you need a centralized globally unique list to streamline stock management.



Asset Inventory

Applying the data unity concept to asset inventory, unifying asset records is the only way for organizations to gain comprehensive insights.

Inaccurate or unreliable data can lead to flawed decisions, ineffective strategies, operational inefficiencies, compliance issues, and missed opportunities, jeopardizing business success.

Data: Bringing the digital to life

Because of the ubiquity of data today, used in everything from manufacturing to medicine, it is easy to forget about it - but every button you press, every website you visit, and every credit card transaction you make creates more data. It is up to businesses to transform this data into something that has real-life impact.

Analytics is helping to turn data into value for businesses but even the best tools are only as good as the data they are fed. But when this data is of good quality, the impact is undeniable. 23 times more likely to acquire customers and enjoying an 8% increase in profits, data-driven organizations transform numbers on a screen into clear advantages for shareholders, employees, and customers.

Transforming Industries with Data Unity

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Today, it's hard to find an industry that hasn't been impacted by data. However, not all organizations see data as universally beneficial. Many sectors are struggling with their data, suffering under the weight of multiple data sources and duplicate records.

Organizations can mitigate these issues by embracing data unity. This will allow for the standardization, cleansing, and deduplication of their data, unlocking the potential held within it.

There are several industries that stand to benefit from data unity:

•Government:

Under the General Data Protection Regulation (GDPR), citizens have the right to access and delete their personal data. Municipalities are therefore obliged to provide access to stored data upon request, and to correct or delete it if necessary. In practice, this seems to be a particularly complex task. Due to the variety of social tasks, municipalities often have a highly fragmented application landscape. Processing a single request often takes dozens of hours and in some cases it can take months. Even then, a complete and reliable record is not guaranteed.

The problem is that data management within municipalities is rarely well organized. There is no central repository of personal information, making it virtually impossible to link a citizen to a „golden record". Without this link, officials must manually search for information in dozens of systems. Not only is this process inefficient, but it also poses specific GDPR risks: how can we be sure it's the same Jan Smit? How do we know that all the information is up to date?

The solution lies in a central system that identifies a ‚golden record' and determines which data should be statistically linked to it. Data Unity helps municipalities with an intelligent solution that quickly locates relevant personal data without a lot of administrative effort. In addition, the system identifies where there is static uncertainty so that an employee can assess whether it is actually the same person. In this way, Data Unity saves dozens of hours per GDPR request, significantly reduces turnaround time, increases data accuracy, and helps local governments act in a demonstrably GDPR-compliant manner.

•Manufacturing:

Where data unity is used to streamline spare parts management and inventory optimization, businesses involved in manufacturing can reap significant benefits. To see optimization on a global basis, organizations need visibility into stock levels everywhere, unencumbered by data duplication or fragmentation.

In being able to look at all the different suppliers available to them and their stock inventories, they can determine the best price or shortest delivery times. Here, there are also scale opportunities, as businesses can order in batches when prices are low.

•Retail:

Retailers can enjoy improved customer insights, more effective marketing campaigns, and greater supply chain efficiency as a result of data unity. Regarding marketing campaigns, for example, it becomes easier for retailers to make sense of the different channels they use to interact with customers. By merging data across these channels and removing duplication, businesses can be more assured that their marketing messages are being sent to the right people. It also enables them to send more personalized messaging. For customer service, frustration can easily build when retailers are unaware of previous interactions with a customer or are unable to quickly see a clear picture of engagements across channels. By having a correct and clear picture of each customer and the interactions that have already taken place with them, retailers are more likely to see higher levels of satisfaction among customers.

•Healthcare:

For businesses involved in healthcare, data unity can be hugely important for patient wellbeing. For example, imagine an individual visits a hospital suffering from a particular condition and healthcare staff are unable to see a holistic picture of all their previous medical records. As a result, doctors cannot see the patient's allergy to a particular type of antibiotics and may prescribe them as a result. This could have disastrous consequences for the patient but is easily avoided when data unity is pursued. It is also important for compliance adherence.

•Logistics:

If you look at logistics companies, being able to say exactly where assets are is essential. They are likely to interface with many different systems, so having global visibility of stock and asset tracking, as well as widespread interoperability is key.

Maintenance of logistics fleets and spare part management also benefit from data unity. It means logistics providers can keep track of the use and longevity of the parts that make up their fleet, allowing for preventative maintenance and long-term health.

Unlock the Power of Quality Data

For organizations to use their data effectively, it must be reliable and trustworthy. But too many organizations are finding their data-driven decision-making hampered by data that is messy, unordered and unreliable. That's why data unity is so important. By prioritizing data unity, businesses gain access to clean, unified information that they can put to use to drive organizational success - now and in the future.

At Eraneos, we have extensive experience in helping organizations gain control over their data. With our Data Unity solution, you can lower costs, optimize operational processes, guarantee compliance, improve data insight, and more.

Reach out to Eraneos today to learn more about this solution.

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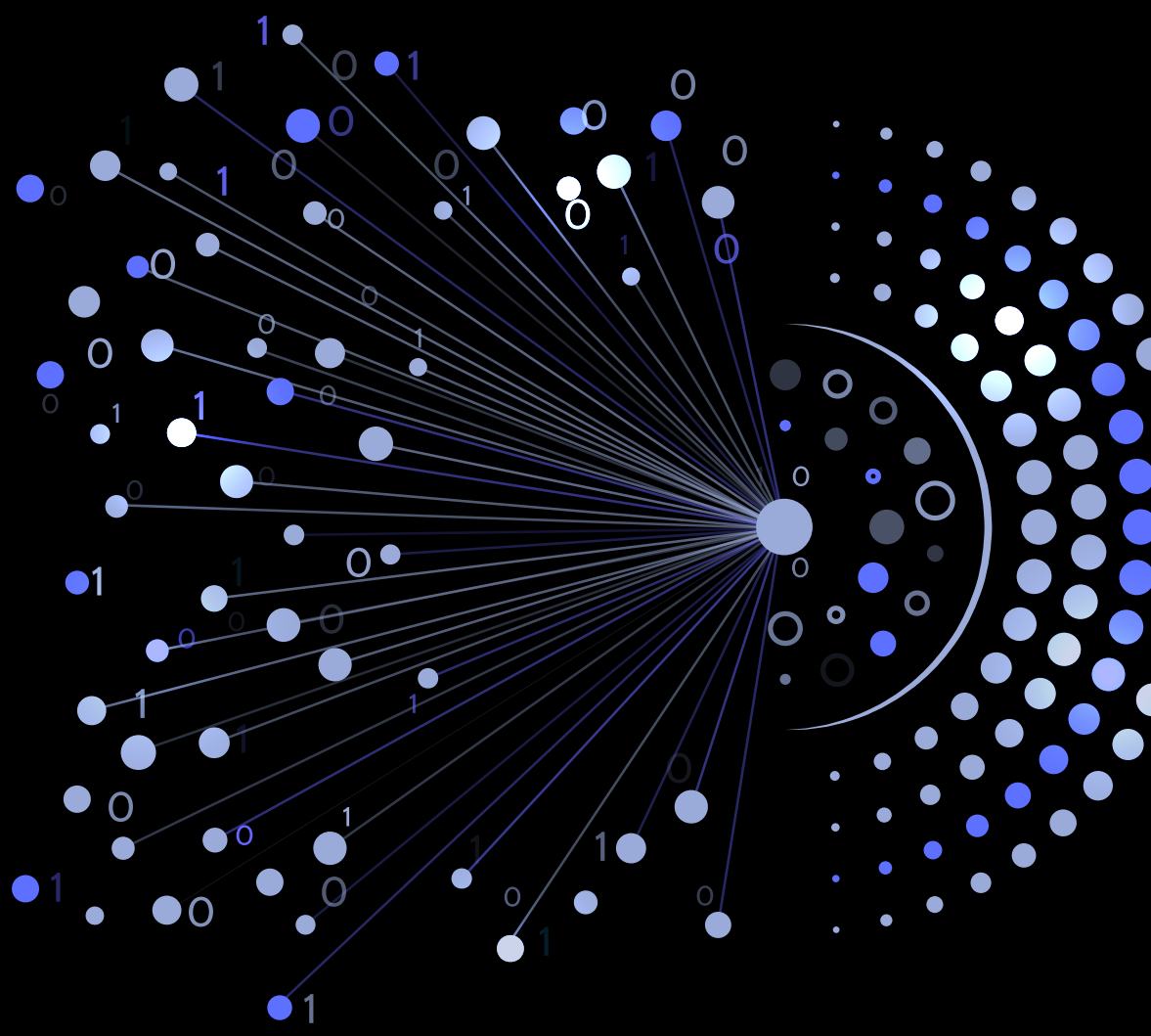

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