

Spotlight Paper by Bloor

Author Robin Bloor

September 2023

Data Fabric and the Future of Data Management

Solix Technologies and the Data Layer



A data fabric provides a unified view of data across an organisation's disparate systems and clouds, enabling new data usage, applications, and technologies to be incrementally added. Solix's product portfolio delivers comprehensive solutions that enable organisations to create a data fabric.

Executive summary

In a data-driven world, organisations need to be able to manage the enterprise data resource intelligently and flexibly. A data fabric is the key enabler, providing a unified view of data across an organisation's disparate systems and clouds and enabling new data usage, applications, and technologies to be incrementally added.

The Solix Common Data Platform (CDP) delivers comprehensive solutions that enable organisations to create a data fabric. These solutions (illustrated below) include:

These solutions include:

- SOLIXCloud Enterprise Data Lake
- SOLIXCloud Enterprise Archiving
- SOLIXCloud Enterprise Content Services (ECS)
- SOLIXCloud Consumer Data Privacy
- SOLIXCloud Enterprise AI

They can be used together to create a data fabric that provides a unified view of data across an organisation's disparate systems and clouds. This will help organisations improve their data flexibility, data governance, and data quality. It will also improve the organisation's AI and BI capabilities significantly.

The Benefits

The primary benefits of creating a Solix-based Data Fabric are as follows:

- A multi-cloud resource management environment.
- Unified data management, providing a unified view and access to all data, regardless of where it resides.
- Simplified and effective data governance. This is provided within a comprehensive data governance framework, helping to ensure that data is secure, compliant, and accessible.
- Cost-efficient: Solix majors on reducing the costs of managing the data layer, particularly in its use of cloud archiving and data lake.
- Analytics-friendly: Solix provides powerful capabilities to support all varieties of analytics applications: AI, ML, NLP and BI.
- Agile development: Solix improves the agility of the data layer and its scales.

Conclusion

In our view, Solix offers the most complete set of solutions to help organisations create a data fabric and better organise and manage their data resources.

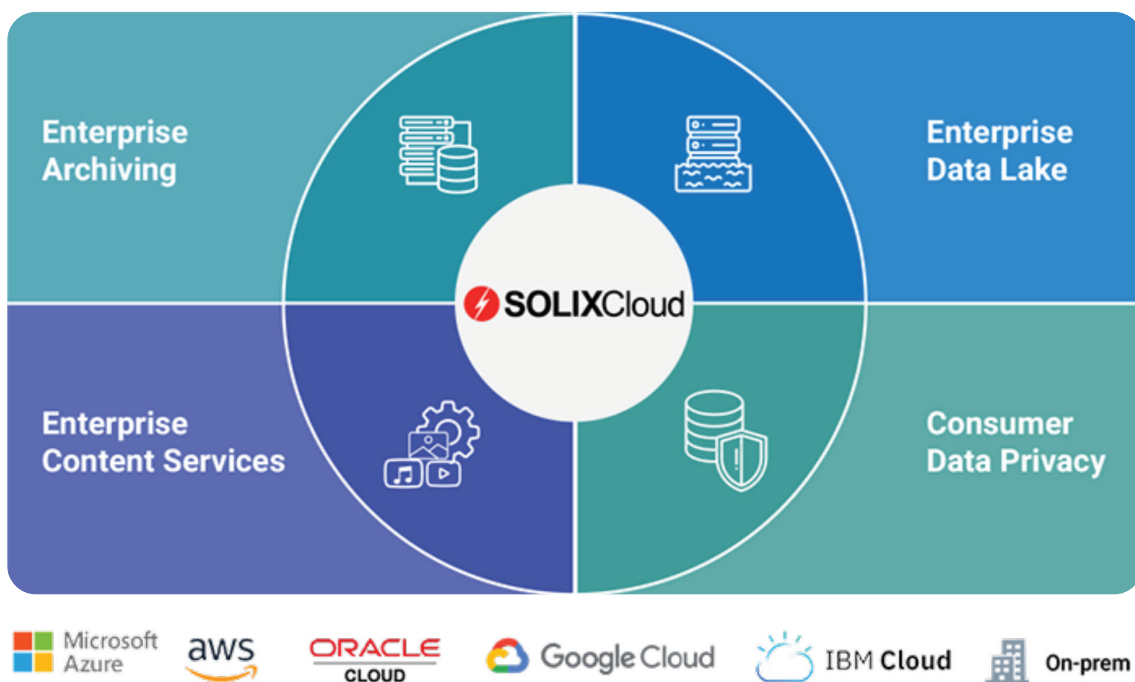
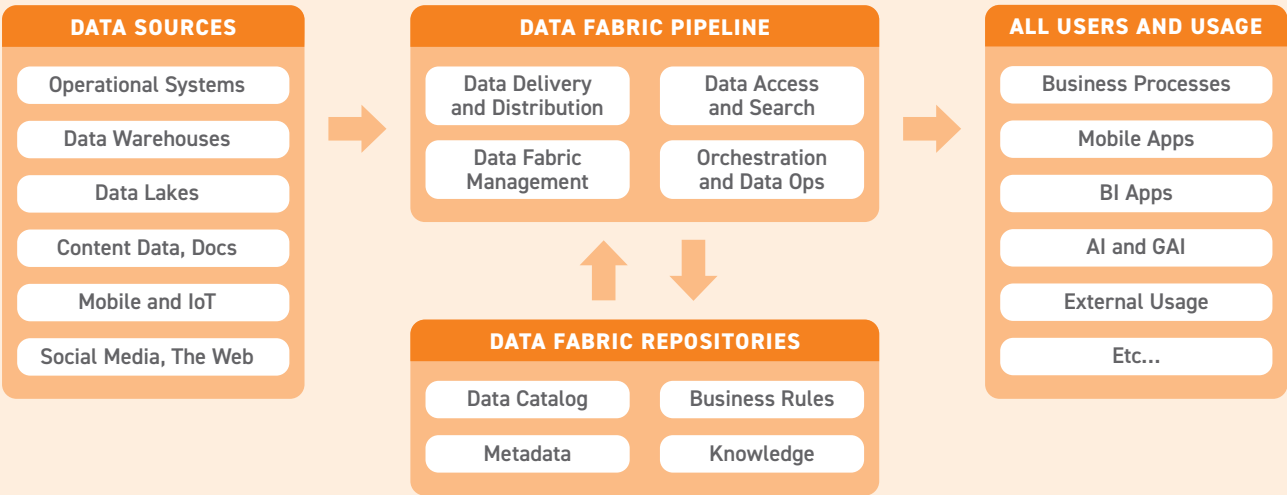
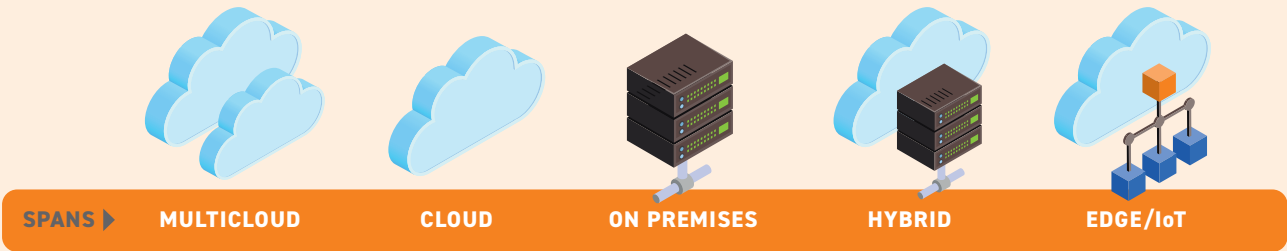


Figure 1 - Overview of the SOLIX Cloud Data Management Solutions

What is a Data Fabric?

A data fabric is a data architecture and infrastructure that organises and supervises the whole enterprise data resource, providing all systems and applications with timely access to all the data and services they may need.

- The data fabric serves the business so that its systems and applications can provide the desired services and be appropriately governed.
- It also serves the IT infrastructure so that it can deliver many of its data services efficiently and economically.
- Furthermore, a data fabric based on cloud native microservice architecture simplifies integration with future systems and applications that the business may choose to be deploy.



The Obstacles to Creating and Maintaining a Data Fabric?

To provide a well-organised data fabric is by no means simple. An uncoordinated data layer would be impractical, and thus, all businesses have some components of a data fabric in place, but few, if any, can claim to have the whole shebang. There is a series of obstacles that need to be traversed to achieve a data fabric. We discuss these, one by one:

1. The Enterprise Computing Infrastructure

Enterprise data can be stored in one or more cloud environments and within enterprise data centers, on desktops or mobile devices, or even on embedded edge devices. Resilience demands that all such data be properly backed up, adding to the complexity of the infrastructure. A data fabric needs to know and be able to traverse this infrastructure.

2. Data Resource Registry

The location and fundamental details of every data object, whether a small file or a huge database, must be known and cataloged in a global manner. Few companies have such a registry. Instead, they are awash with data silos that are poorly integrated with other data resources or not integrated at all. A data fabric requires a data resource registry to locate and integrate all the data assets.

3. Data Governance

Data governance implements policies, rules, and procedures to ensure that all data is managed in a consistent way and is compliant with all enterprise and regulatory imperatives. Data governance in many businesses is weak and poorly implemented. The data fabric needs to be at the service of data governance.

4. Data Quality

While the situation varies, in general, poor data quality is an obstacle in various areas of enterprise IT. Aside from there being inaccurate data, there is also the uncertainty introduced by the lack of data lineage information. Data that does not have a reliable audit trail should not be used in any analytical applications, whether AI or BI, as it can lead to inaccurate and misleading results. It is of the utmost importance in training data for AI. A data fabric can help to improve data quality by providing a single view of data and applying automated data quality checks.

5. Data Security

Both data security and data quality can be viewed as aspects of data governance. Data security is a critical concern for all organisations, which can be assisted by a data fabric providing a single point of access for data, encrypting data in transit and at rest, and implementing role-based access controls.

6. Data Privacy

Consumer data privacy regulation is on the rise globally and consequently the data fabric must support powerful search, metadata management and data catalog features as well as perform critical functions like masking, redaction and erasure.

The primary activities of a functional data fabric can be described under four headings as follows:

1. Data Mapping (Metadata, Data Catalog and Discovery)

A data fabric delivers a data catalog and maps all the components to the enterprise data layer by:

1. Collecting metadata from disparate data sources:

The data fabric collects metadata from all of the data sources that are integrated into it. This metadata is then stored in the data catalog.

2. Indexing and tagging metadata:

The data fabric indexes, labels, and tags the metadata in the data catalog. This makes it easier for data users to search and filter for data assets.

3. Mapping metadata to the enterprise data layer:

The data fabric maps the metadata in the data catalog to the enterprise data layer. This makes it possible for data users to access data assets from the enterprise data layer through the data catalog.

Note that the data mapping capability of a data fabric is distinctly different from a master data management (MDM) resource and far more comprehensive. A data fabric encompasses all data, not just whatever master data is defined within an MDM repository. It is more agile and far more scalable. It can be used to manage data from a variety of sources, including on-premises, cloud, and hybrid environments and any application. In general, it is also more likely to be well-automated. An MDM repository, where one exists, could be included within a data fabric.

2. The Data Fabric and Enterprise Computer Infrastructure

The data fabric sits on top of the enterprise computer infrastructure, providing a layer of abstraction that makes it easier to manage data. The fabric uses a variety of technologies, such as metadata cataloging, APIs, and federation, to connect to different data sources and provide its unified view of data.

Cloud native, W3C standards are essential to enable multi-cloud data fabric connections between computer resources whether in the cloud, in a data center or on the desktop.

3. Data Fabric, Data Governance and Data Lineage

Data fabric naturally integrates with data governance and lineage. It thus supports all areas of data governance, not just the enterprise policies and procedures for managing data but also data security and whatever external data compliance rules are implemented.

In respect of data lineage, ultimately, the data fabric map needs to record and maintain the data lineage of all data. While this will already be done for a portion of the data resource, it will rarely be done for the whole resource.

4. The Data Fabric and the Data Lifecycle

The data fabric is inevitably involved in every stage of the data lifecycle, from data creation to deletion. We have already discussed its importance in data governance and data management, so here we confine ourselves to the start and end of the data lifecycle. The fabric is aware of all points of entry of data into the organisation and is involved in all archiving activities.

At the front end, it needs to record the creation of all new data objects (files, back-ups, databases, new data added to data lakes and so on). This may involve metadata capture and the updating of data audit trails.

Nowadays, data archiving is less about data deletion than it used to be and is more about migrating rarely used data to less expensive storage space in the cloud. For example, you can store a terabyte of data in the cloud for less than \$100 per month, and the cost of data storage tends to fall at about 7% per annum. In general, deleting data can be more expensive than storing it cheaply. That, of course, depends on how well the data layer is organised. The cost of deleting data includes the cost of identifying and locating the data, the cost of physical deletion and the cost of ensuring the data is irrecoverable.

The archiving of data inevitably involves data governance, and there can be compliance rules that forbid or even mandate the deletion of data (such as *"the right to be forgotten"* in GDPR).

It's worth noting here that the advent of GAI may deter data deletion, as there may be a virtue in training LLMs on some old enterprise data – in which case this will alter the actual value of older data.

Data Categories

Logically, there are three different groupings of data in an organisation's data layer. Thus, there is a visible division that inevitably exists within the data layer of every organisation as regards managing data. These three categories are:

1.

Operational data

The data that runs all the applications that carry out the activities of the business.

2.

Analytical or knowledge data

The data gathered and used to review the activities of the business by AI and BI applications and systems.

3.

Content data

The data artifacts that are created in the operation of the business including documents, website data, images, videos etc.

In general, we can think of all operational data as also being **source data** for analytical systems. This is important from the perspective of establishing reliable data lineage, which analytic systems need. The audit trail of all "**knowledge data**" needs to be complete. This means that the same attention to data lineage needs to be given to all other data sources (public sources, data rental sources, data from partners and agents, etc.).

You will see these three categories emerge as you read our description of the Solix product portfolio and Data Fabric technology. However, a data layer involves more than these three categories. Data is not self-managing and, hence, needs to be managed with respect to its lifecycle and its availability for use. It also needs to be governed.

In the description of the Solix portfolio that follows, it will be easier to understand its structure and functionality if you think in these terms.

The Solix Product Portfolio

Taken together, the Solix software portfolio provides a very broad and deep set of capabilities to the enterprise data layer, which includes the establishment of a data fabric. We will discuss its capabilities in a logical order as this will help to clarify how they integrate and how they can be applied.

The SOLIXCloud

The natural place to begin is with the SOLIXCloud, a cloud-based data management platform that provides a single view of all enterprise data, regardless of where it resides. It is powered by Solix Common Data Platform and consists of key components – Solix Connect, Solix Data Governance, Solix Metadata Management, and Solix Discovery, which are common across both the Enterprise Archiving and Enterprise Data Lake.

Technically, it implements a cloud-native W3C open architecture. This means that it can enable access from anything to anything, anywhere in a multi-cloud/on-premises environment.

It can ingest, manage and access data as illustrated in **Figure 2**.

Data ingestion: It can ingest data from a wide variety of sources, including relational databases, NoSQL databases, cloud storage, mainframes, production applications and data warehouses (via Solix Connect) – covering almost every data source there is.

Data Management: Solix provides four specific contexts for the data it presides over and manages, as illustrated in **Figure 2**, named Enterprise archiving, Enterprise Data Lake, Enterprise Content Services and Consumer Data Privacy, which comprise the Solix Common Data Platform. We discuss all of these below.

A set of services presides over the Common Data Platform (CDP), which is activated when data is ingested or changed within the CDP. These services enable Data Governance and Metadata management and also text search and structured query access. Additionally, an API to the data is provided so that it can be exported for AI and BI activity.

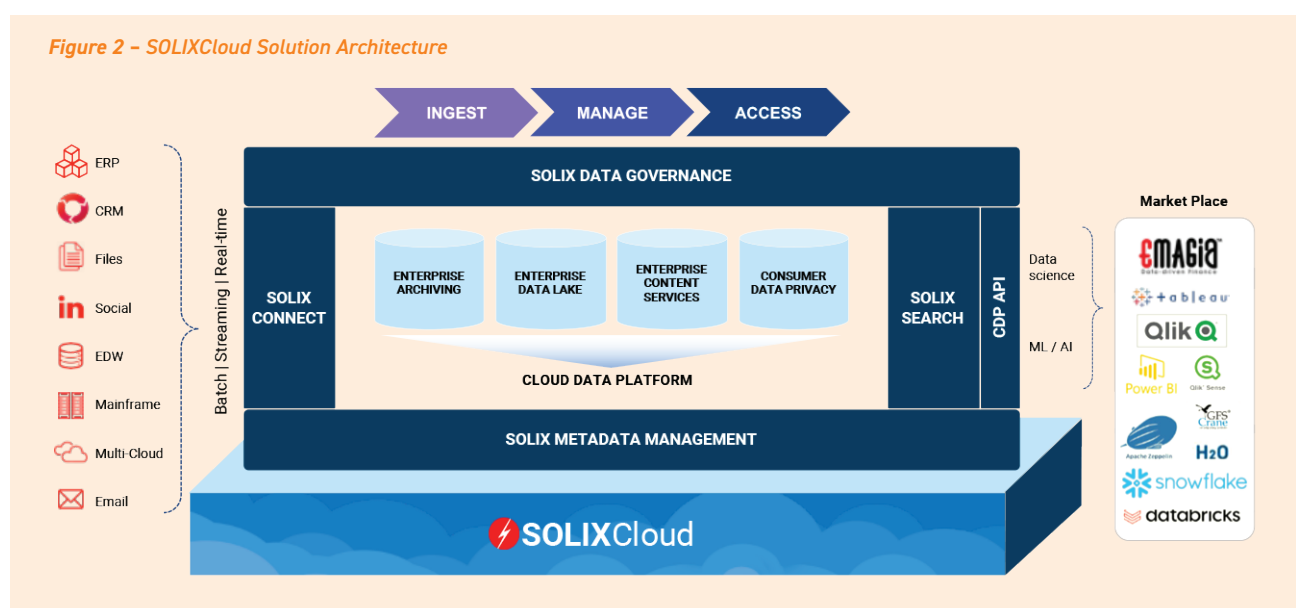
Data Access: A common Search capability as well as structured query access is provided for the CDP. Additionally a powerful API is provided for access to data from third party AI & BI tools.

Solix Enterprise Archiving

The Solix archiving capability embodies a Unified Information Lifecycle Management (ILM) framework enabling organisations to archive inactive enterprise data to improve application performance, reduce infrastructure costs, and achieve compliance goals. SOLIX CDP 3.0 continues to support Hadoop. In addition to that we have introduced SOLIX SafeArchive based on the Citus Distributed Postgres database and caters to both structured and unstructured data. It has four components:

- **Data classification:** This component helps organisations classify their data according to its value, sensitivity, and retention requirements in order to determine which data should be archived and for how long.
- **Data migration:** This helps organisations to migrate their data from production systems to the archive, in real time or in a batched manner.
- **Data management:** This provides a centralised repository for managing archived data. It includes features such as governance, compliance, search, and reporting.
- **Data protection:** This component protects archived data from unauthorised access, deletion, and corruption. Its features include encryption, auditing, and disaster recovery.

Figure 2 – SOLIXCloud Solution Architecture



Using this suite of products, organisations can archive all data, whether structured, unstructured or semi-structured, into a common repository with a single set of ILM data governance controls and a single data catalog view. It caters to database archiving, application retirement, file archiving and email archiving. Archiving can be tailored to specific needs based on almost any factor, including regulatory requirements.

It is scalable and secure. Data is encrypted at rest and in transit. Archived data is fully accessible, with access controlled by role-based permissions and provided through various methods, including text search, structured reports, and ad hoc queries.

Solix Enterprise Data Lake

Solix provides what we believe to be an intelligent enterprise data lake solution. It is cloud-based, enabling organisations to securely collect, store, and manage their data in one place. It is a unified repository catering to all data, structured or unstructured. We tend to think of it as the natural enterprise store for all knowledge data.

The data lake is highly scalable and can ingest data from a variety of sources, including on-premises data sources, cloud data sources, and streaming data sources. It provides a variety of features to help organisations manage, prepare and pipeline their data with respect to data quality, data lineage, and data governance. And, as previously noted, there is an API with connectors to the various AI and BI tools.

It comprises two component products: Data Preparation and Data Pipelining.

- **The Data Preparation** component embodies comprehensive data profiling, cleansing, enrichment, transformation, and modeling capabilities. It prepares data for analytical purpose and can serve up data to cloud datawarehouses, machine learning, customer analytics and BI applications.
- **The Data Pipelining** component enables users to create and manage data pipelines to move data from various sources to the data lake and then to downstream applications – often working hand-in-hand with Data Preparation. It includes a library of predefined data pipelines that can be used for common tasks, as well as tools and templates to create and manage custom pipelines. The data pipelining component includes data quality monitoring features that can be used to track the performance of data pipelines and identify any potential problems.

Solix Enterprise Content Services (ECS)

Solix ECS provides a cloud-based content management platform that helps organisations store, govern, access, share, and collaborate on all their content. This is content in its widest sense, documents, images, videos, audio files, web content in all its variety and other files such as CAD files or medical images.

ECS provides a secure, centralised content repository, a single place to store all content, regardless of its format or origin. It makes all content available and easily accessible. This includes file sharing with internal and/or external users. You control who has access to the content by setting permissions. It can also automatically archive content based on defined retention policies.

It helps with the digitisation of paper-based documents. It offers a wide range of features to help you comply with data privacy regulations, such as GDPR and other related regulations, such as CCPA. This includes features for managing consent, encrypting data, and auditing access to content.

Solix Consumer Data Privacy

This component provides a suite of integrated solutions that target consumer data protection. The suite includes end-to-end encryption, metadata management, data profiling, data governance rules, sensitive data discovery, data masking, and data compliance to ensure that all personally identifiable information (PII) is properly identified, classified, masked, and able to meet regulatory requirements.

This component specifically satisfies all the stringent requirements of GDPR and other prominent regulatory requirements such as CCPA and LGPD. It provides organisations with a comprehensive view of their data management practices and how they align with the requirements of these regulations. It implements a broad set of PII principles derived from GDPR and expanded to embrace other flavors of PII – and it automates their application.

Its general compliance reporting capabilities include personal data discovery and reporting, data retention and disposal, data access and processing controls, and data breaches and security incidents. It also provides many reports required by and specific to particular compliance regulations.

The data that the Solix Consumer Data Privacy suite manages includes:

- **Personally identifiable information (PII):**
Information such as names, addresses, phone numbers, email addresses, etc.
- **Sensitive data:**
Such as financial data, medical data, and criminal records.

Solix and The Data Fabric

The Solix Common Data Platform is a software solution that helps organisations to implement a data fabric. It provides all of the functionality we have described above and more that we've not delved into. It provides cloud data management – multi-cloud and multi-tenant – and embodies an application framework for creating and deploying applications.

Those applications include Enterprise Archiving, the Enterprise Data Lake, Enterprise Content Services and Consumer Data Privacy. They may also include data preparation, pipelining, and enterprise AI and BI.

A Solix Data Fabric is built and maintained by employing the various components and services of the Solix CDP. Such a data fabric provides an end-to-end information architecture within which many applications and services can be deployed.

Solix CDP provides the data fabric with comprehensive capabilities for Governance, Security, Compliance and the whole gamut of AI and BI applications that feed from the four different forms of data store and beyond.

The Data Fabric created within this environment can provide a global data access capability to all applications and users. It can support data preparation, data transformation, data flows and data quality activity. It can cater to applications of any type, feeding data from data stores of any type, including semantic applications. It can support workflows knitting together applications of any kind. It enables a full data catalog with comprehensive support of all metadata and provision of data lineage. It can provide comprehensive support for DevOps: source code control, continuous integration, continuous delivery and continuous deployment.

“ A Solix Data Fabric is built and maintained by employing the various components and services of the Solix Common Data Platform. Such a data fabric provides an end-to-end infrastructure architecture within which many applications and services can be deployed. ”

Benefits and User Experience

You can think of the benefits of the Solix software portfolio as being both strategic and tactical. By providing a cloud-based data platform, Solix provides a compelling strategic offering that combines a global cloud-based data capability that lays the foundation for a Data Fabric. However, in general, businesses adopt particular software solutions to address immediate pain points. They may select their solution with strategy in mind, but the goal will be to fix a problem in a specific area.

If an organisation intends to gradually deploy the full Solix solution, then each step forward that addresses a particular need will have a strategic dimension. So, it's worth summarising here the strategic benefits that Solix can provide. They are:

- **Unified data management:** Solix provides a unified view of all data, regardless of where it resides, making it easy to find, access and utilise.
- **Centralised data governance:** Solix provides a comprehensive but simplified governance framework for your data. It helps to ensure that data is secure, compliant, and accessible in a permission-based manner.
- **Cost-effective:** Solix majors on reducing the costs of managing the data layer, particularly in its use of the cloud for both archiving and providing a global data lake.
- **Analytics-friendly:** Solix provides powerful capabilities to support all varieties of analytics applications: AI, ML, NLP and BI.
- **Agile development:** Solix improves the agility of the data layer and it scales. It provides an environment that favors building and deploying new data-driven applications.

When an organisation gradually adopts Solix, these benefits gradually increase as new components are implemented.

Below are a series of user stories highlighting individual tactical applications of Solix.

User Stories

The following is a selection of genuine user stories that have emerged from Solix deployments.

Data Integration

Data engineers need to easily merge data from different sources like databases, cloud services, and APIs. Solix has been applied in many instances for this purpose, making it possible to establish a unified and *“current”* dataset for analysis and reporting, eliminating the need for extensive and ad-hoc manual data extraction and transformation.

Real-time Data Streaming

A business analyst needed to create real-time data streams from diverse applications and devices. Solix made this possible, thus empowering the business analyst to closely monitor key performance indicators and make well-informed decisions based on fully up-to-date data.

Data Governance and Regulatory Compliance

Data stewards are tasked with defining and implementing governance policies across the organisation. Data stewards have implemented Solix for this task, ensuring the precise and appropriate protection for sensitive data (PII) while granting authorised individuals and personnel efficient access to and utilisation of the data in full compliance with GDPR.

In respect of this, auditors who need to trace the origin and transformations of specific data points can ensure data lineage and provide transparency into how data is processed and utilised throughout its lifecycle.

Additionally, the compliance officer was able to ensure that the organisation abided by industry regulations around data privacy and retention policies. The compliance officer was able to identify, classify automatically, and archive data based on predefined rules and timelines through the Data Fabric that was established. Thus, it was possible to maintain a compliant data repository, respond to audit requests, and meet legal and regulatory obligations.

Self-Service Data Science

One of the obstacles to the speed of data science projects is the time spent to discover and marshal the data to be analysed. A data scientist uses Solix specifically for this purpose because of its ability to search data, understand metadata, and thus enable the discovery of pertinent datasets and its ability to establish data pipelines. The autonomy this provides to data scientists reduces their reliance on IT teams to carry out the data pipeline work, which in turn reduces the *“time to insight.”*

The data scientist can integrate machine learning models within the Data Fabric seamlessly, allowing him to leverage real-time data for model training and deployment. Thus, establishing a central hub for data and model management is possible.

Multi-Cloud Strategy

A cloud architect uses Solix to deploy the organisation's Data Fabric across multiple cloud providers. This ensures flexibility, prevents vendor lock-in, and is cost-effective. It also streamlines data management and availability across a variety of environments.

For example, they may be interested in improving their data archiving capability. In that instance, the primary benefits are likely to be reduced storage costs, improved performance and availability, and better-automated archiving.

If they are interested in establishing a global data lake, their primary goal may be to improve data governance and compliance because of the capabilities Solix provides in that area. If they proceed, they will likely reduce storage costs, improve their control of metadata and better facilitate their AI and BI activities.

The point we're making here is that adopting Solix will likely provide an immediate tactical pay-off but will also deliver a downstream improvement in other aspects of data management.

Solix CD customers are able to implement features to establish a Data Fabric rather than attempting to create one from the get-go.

Future Proofing and the Entropy Issue

Data is the lifeblood of an organisation. It is used to make decisions, track performance, and improve operations. But it can also be a liability. If it is not managed properly, it can become disorganised, inaccurate, and even out of date. This can lead to a number of problems, including:

- **Increased costs:**
Data management costs can easily escalate, requiring investment in resources, software, and personnel just to stop the data resources from spinning out of control.
- **Reduced productivity:**
When data is disorganised, it takes longer for users and even applications to find and access the data. This leads to lost productivity and, sometimes, missed opportunities.
- **Poor decision-making:**
When data is inaccurate, it causes inferior decision-making, which can have a negative impact on the organisation's line. The garbage-in/garbage-out maxim applies.
- **Regulatory non-compliance:**
Organisations are subject to a number of regulations that require them to keep accurate data. If they fail to do so, they could face fines or other penalties.

The entropy problem is a natural consequence of the way data is used in organisations. As data is collected, stored, and processed, it becomes increasingly disorganised and inaccurate. This is due to:

- **Human error:**
People make mistakes. Data entry errors, program errors, DBA errors, file errors – all can lead to inaccurate data, lost data or breaks in the data audit trail.
- **System errors:**
Software and hardware systems can also fail. This can lead to data corruption, loss, or deletion.
- **Data growth:**
The amount of data that organisations collect is growing exponentially. Unless it is properly tracked and managed, data can simply get lost.

Establishing a Common Data Platform and within it, a data Fabric is, in many ways, an antidote to this. Not only does it minimise the impact of data entropy, it also provides a flexible data layer that can be adjusted according to the emergence of new and unexpected data requirements.

Generative AI

An excellent example of this is the recent emergence of Generative AI, which was foreseen by very few IT commentators and analysts, if any. This has become a compelling technology that is applicable in almost all organisations, and it did so in the space of a few months.

Although this technology is still in its infancy, it is already clear that it will need to have access to most, if not all, of an organisation's data in order to deliver its benefits. The data organisation it will require and the associated workloads are not yet clear. However, what is clear is that many organisations will be impeded from exploiting this new technology because of the disorganised state of the enterprise data layer.

However, those companies that have established a proven Data Fabric will be well-situated to take advantage of this new and promising technology.

It is in the nature of the IT industry that disruptive technology developments regularly appear as if from nowhere – the Internet, Social Networks, Cloud Computing, Big Data and Generative AI are all examples.

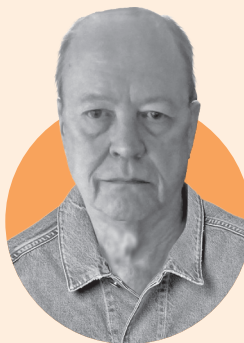
To have a Data Fabric is to be able to leverage such unpredictable and unexpected developments.

“Establishing a Common Data Platform and within it, a data Fabric is, in many ways, an antidote... Not only does it minimise the impact of data entropy, it also provides a flexible data layer that can be adjusted according to the emergence of new and unexpected data requirements.”

About the author

ROBIN BLOOR

Founder



Robin Bloor is a leading authority and influencer in the industry. In his role as an industry analyst, Robin has become an influential commentator on many corporate IT issues and is in great demand as a presenter at conferences, user groups and seminars addressing audiences across the world on a variety of technology topics from eCommerce through to IT Strategy and trends.

For a decade and a half he was the driving force behind the research effort at Bloor Research, and authored many of its industry reports and product comparisons. He has expertise across the whole field of IT with particular expertise in database, development tools, system management, IT security and hardware technology.

His best-selling business book "The Electronic Bazaar: From the Silk Road to the eRoad" was featured as book of the week by the Times, referred to as "a classic" by Publisher's Weekly (in the US), and described by the Library Journal (also in the US) as "One of the Best Business Books of 2000".

Now living in Austin, Texas, he is still a regular visitor to Europe. He is also a Partner in Hurwitz & Associates, a partner company to Bloor Research which provides IT analysis services to US companies.

He has been influential in shaping the direction and thinking of a generation of IT strategists and continues to provide insight on the direction of IT as it moves forward.

Bloor overview

Technology is enabling rapid business evolution. The opportunities are immense but if you do not adapt then you will not survive. So in the age of Mutable business Evolution is Essential to your success.

We'll show you the future and help you deliver it.

Bloor brings fresh technological thinking to help you navigate complex business situations, converting challenges into new opportunities for real growth, profitability and impact.

We provide actionable strategic insight through our innovative independent technology research, advisory and consulting services. We assist companies throughout their transformation journeys to stay relevant, bringing fresh thinking to complex business situations and turning challenges into new opportunities for real growth and profitability.

For over 25 years, Bloor has assisted companies to intelligently evolve: by embracing technology to adjust their strategies and achieve the best possible outcomes. At Bloor, we will help you challenge assumptions to consistently improve and succeed.

Copyright and disclaimer





This document is copyright **Bloor 2023**. No part of this publication may be reproduced by any method whatsoever without the prior consent of Bloor Research.

Due to the nature of this material, numerous hardware and software products have been mentioned by name. In the majority, if not all, of the cases, these product names are claimed as trademarks by the companies that manufacture the products. It is not Bloor Research's intent to claim these names or trademarks as our own. Likewise, company logos, graphics or screen shots have been reproduced with the consent of the owner and are subject to that owner's copyright.

Whilst every care has been taken in the preparation of this document to ensure that the information is correct, the publishers cannot accept responsibility for any errors or omissions.



Bloor Research International Ltd

-  20-22 Wenlock Road, London N1 7GU, United Kingdom
-  +44 (0)1494 291 992
-  info@Bloorresearch.com
-  www.Bloorresearch.com