

Digital Twins as Investable Data Products: The Next Evolution of Data Commercialisation

From Operational Simulation to Structured Economic Asset.

Digital twins are rapidly becoming one of the most important developments within the modern data economy.

The concept of the digital twin can be traced to NASA's space programme of the 1960s, where engineers used physical replicas and sophisticated simulators to mirror spacecraft conditions and troubleshoot systems from the ground, most notably during the Apollo 13 mission in 1970. While these systems were not digital twins in the modern sense, they are widely regarded as important precursors to the concept.

The modern digital twin framework emerged through Michael Grieves' product lifecycle management work in 2002, with the term "digital twin" later popularised by NASA, particularly through the work of John Vickers around 2010. From these aerospace and engineering roots, digital twins evolved through manufacturing and industrial applications before expanding into the sophisticated, data-rich environments seen today across sectors including healthcare, energy, logistics, real estate and urban infrastructure, where organisations increasingly use them to improve forecasting, optimise performance and support predictive decision-making. Yet despite their growing importance, digital twins are still often viewed primarily through a technological lens.

A more significant shift may now be emerging.

As data ecosystems mature and governance frameworks become more sophisticated, digital twins may begin to evolve from internal operational models into structured commercial products capable of generating independent economic value.

In time, certain digital twins may even begin to resemble investable data assets in their own right.

What a Digital Twin Actually Represents

In practice, a digital twin is not simply a dataset or a software model.

It is a continuously evolving data environment combining multiple layers of information, including real-time operational inputs, historical records, predictive algorithms, simulation models and external datasets. Together, these components create a dynamic representation of a physical asset, operational process or broader system.

A digital twin may represent an individual machine, a transport network, an energy grid, a supply chain or even a human patient within a healthcare environment. Increasingly, digital twins are being deployed not merely to observe systems, but to simulate future outcomes, optimise performance and support strategic decision-making.

Importantly, digital twins are not static.

They evolve continuously as new information is incorporated, systems change and analytical models improve over time. Their value derives not simply from the existence of underlying data, but from the interaction between datasets, governance structures, predictive capabilities and ongoing operational relevance.

In this sense, digital twins are better understood as governed data environments rather than isolated digital assets.

The Shift from Internal Tool to Commercial Product

Historically, most digital twins have been developed and utilised internally.

Manufacturers have used them to monitor industrial assets. Infrastructure operators have applied them to predictive maintenance. Healthcare organisations have explored their potential for diagnostics and treatment modelling. In each case, the digital twin functioned primarily as an internal operational capability.

That position is beginning to change.

As organisations become more interconnected and data collaboration becomes increasingly important, digital twins are starting to move beyond the boundaries of the originating enterprise. Multi-party participation is becoming commercially valuable.

Infrastructure twins may now be relevant not only to operators, but also to investors, insurers, regulators and financing counterparties. Healthcare twins may support pharmaceutical research, clinical development and artificial intelligence training environments. Supply chain twins may enable optimisation across entire commercial ecosystems rather than within a single organisation.

In these contexts, the digital twin ceases to be merely an operational tool.

It begins to resemble a commercial data product.

Why Digital Twins Have Significant Commercial Potential

The commercial potential of digital twins lies in their ability to create scalable insight.

Unlike physical assets, governed digital models can support simultaneous utilisation across multiple users and applications. A well-structured digital twin may generate value through licensing arrangements, analytics services, predictive outputs, operational optimisation or broader ecosystem participation.

In some cases, the economic value generated by the twin may exceed the direct value of the underlying physical asset itself.

This is particularly true where insights are scalable, commercially reusable or capable of supporting multiple forms of downstream decision-making. Predictive infrastructure models, healthcare simulation environments and AI-enhanced operational twins may all produce outputs with independent commercial significance.

As a result, digital twins increasingly sit at the intersection of several major economic trends: artificial intelligence, data commercialisation, predictive analytics and digital infrastructure.

The implications are potentially substantial.

Why Digital Twins Are Difficult to Commercialise

Despite their potential, digital twins remain institutionally difficult to commercialise at scale.

The problem is not technological capability. It is governance and legal structure.

Most digital twins rely upon multiple datasets originating from different organisations, jurisdictions and regulatory environments. Questions quickly arise regarding ownership, permissions, contribution rights and downstream usage.

Control becomes equally complex. If multiple parties interact with a digital twin, governance frameworks must determine who can access the environment, what forms of analysis are permitted, how outputs may be used and whether derivative insights can be redistributed or commercialised further.

The issue becomes even more complicated where the twin continuously evolves through new inputs and machine learning processes. Unlike conventional static assets, digital twins change over time. Their economic characteristics, governance obligations and commercial outputs may evolve continuously.

This creates challenges not only for operational governance, but also for valuation, contracting and financing structures.

In many respects, digital twins expose the same structural problem increasingly visible across the broader data economy: commercially valuable data environments often lack the institutional architecture necessary for reliable external participation.

The Institutional Gap in the Data Economy

All mature asset classes depend upon institutional infrastructure.

Property relies upon registries and title systems. Financial instruments rely upon clearing and settlement infrastructure. Intellectual property depends upon recognised legal rights, licensing frameworks and enforcement mechanisms.

Digital twins currently lack equivalent institutional structure.

Without clear governance frameworks, rights allocation mechanisms and enforceable operational controls, even highly valuable digital environments remain difficult to scale commercially. Trust becomes fragmented, counterparties become cautious and market participation remains constrained.

The challenge is therefore not simply commercial. It is structural.

For digital twins to evolve into investable or financeable data products, they must become more clearly identifiable, governable and externally reliable.

From Simulation Model to Structured Data Asset

Several conditions are likely to become increasingly important as digital twins mature commercially.

First, the digital twin must exist as a sufficiently defined and bounded environment. Participants need clarity regarding the scope of the model, the datasets involved and the operational parameters governing its use.

Secondly, rights and responsibilities must become more transparent. Organisations contributing data, operating the twin or accessing outputs require legal certainty regarding permissions, restrictions and commercial entitlements.

Thirdly, governance frameworks must become embedded within the operational architecture itself. Access controls, usage permissions, audit mechanisms and derivative rights management cannot remain purely informal or contractual.

Controlled utilisation models also become increasingly important. In many cases, unrestricted extraction of underlying data will be commercially unattractive or operationally inappropriate. Instead, value is likely to derive from permissioned access within governed environments.

Finally, valuation methodologies will need to evolve. As digital twins begin generating predictable commercial outputs, licensing revenues or operational savings, markets may increasingly seek ways to assess their economic significance more systematically.

The Role of Data Asset Foundations

This is where governance models such as the Isle of Man's Data Asset Foundation framework become particularly relevant.

The Data Asset Foundation model establishes a legal and operational infrastructure capable of supporting governed data assets within structured institutional environments.

Within such a framework, digital twins could potentially be housed inside dedicated governance structures, supported by registered datasets, subject to embedded operational controls and made accessible to multiple participants within permissioned environments.

This is a significant conceptual shift. Rather than treating digital twins merely as software tools or internal operational systems, frameworks such as Data Asset Foundations begin to position them as governed economic environments capable of supporting broader commercial participation.

The value of such an approach lies not simply in legal recognition, but in the creation of trust, governance and operational clarity around complex multi-party data ecosystems. In practice, this could support more sophisticated licensing models, collaborative environments, investment structures and potentially financing arrangements linked to governed digital infrastructures.



Could Digital Twins Become Financial Assets?

The next stage of this evolution, while still emerging, is increasingly difficult to ignore.

Where a digital twin generates predictable revenues, supports scalable licensing arrangements or underpins commercially significant operational environments, it may begin to resemble other categories of intangible asset already recognised within broader financial markets.

This does not imply immediate commoditisation or standardisation.

However, it does suggest a possible trajectory.

Digital twins may evolve from internal operational tools into structured commercial products and, in certain cases, into governed data assets capable of supporting investment, valuation and potentially financing activity.

The significance of this possibility extends beyond technology itself.

It reflects the broader institutional evolution of the digital economy.

Why This Matters Now

Several structural trends are accelerating the importance of digital twins simultaneously.

Artificial intelligence increasingly depends upon large-scale simulation environments and governed training datasets. Infrastructure systems are becoming more connected and data-intensive. Businesses are seeking more predictive operational models. Investors and regulators are demanding greater visibility into complex systems and assets.

At the same time, existing governance frameworks are beginning to show their limitations.

The commercial value of digital twins is increasing more rapidly than the institutional structures surrounding them. This creates both opportunity and risk.

The organisations that succeed in the next phase of digital infrastructure development are unlikely to be those that simply generate the largest volumes of data. They are more likely to be those capable of structuring, governing and commercialising complex data environments in a way that external counterparties can trust.

Conclusion: The Emergence of Investable Data Products

Digital twins illustrate a broader transformation occurring across the digital economy.

Data is no longer functioning solely as an operational input. Increasingly, it is becoming the basis of structured commercial products capable of generating independent economic value.

Realising that potential, however, will depend upon more than technological sophistication alone.

It will require governance frameworks, legal structures and institutional infrastructure capable of supporting trust, enforceability and controlled participation at scale.

Frameworks such as Data Asset Foundations represent an early attempt to build that infrastructure.

If successful, they may help enable the transition from digital twins as internal analytical models to digital twins as governed, commercial and potentially investable data products.

The significance of that shift extends far beyond any single technology.

It may represent part of the next institutional evolution of the global data economy.

Frequently Asked Questions

Q1 What is a digital twin?

A digital twin is a dynamic digital representation of a physical asset, process or system that combines real-time data, historical information, predictive models and analytical capabilities within a continuously evolving environment.

Q2 Why are digital twins becoming commercially important?

Digital twins allow organisations to simulate outcomes, optimise operations, improve forecasting and generate scalable insights across multiple industries including infrastructure, healthcare, manufacturing and logistics.

Q3 Can digital twins generate revenue?

Yes. Digital twins may generate revenue through licensing arrangements, analytics services, predictive outputs, access-based commercial models and broader participation within governed data ecosystems.

Q4 Why are digital twins difficult to commercialise?

Digital twins often involve multiple datasets, contributors, jurisdictions and governance obligations. Questions regarding ownership, permissions, access rights and derivative outputs can become highly complex without structured legal and governance frameworks.

Q5 Are digital twins considered assets?

Currently, digital twins are generally treated as operational systems or software environments rather than standalone asset classes. However, governance frameworks may increasingly support their treatment as structured commercial data assets.

Q6 What role does governance play in digital twin environments?

Governance is critical. It helps establish control over access, usage rights, provenance, operational restrictions, auditability and commercial participation within complex multi-party data ecosystems.

Q7 What is a Data Asset Foundation?

A Data Asset Foundation is the legal and operational framework enacted in the Isle of Man to support the governance, registration, valuation and controlled utilisation of structured data assets.

Q8 How could Data Asset Foundations support digital twins?

Data Asset Foundations may provide governance infrastructure capable of supporting digital twins within structured legal environments, including rights management, controlled access, operational oversight and multi-party participation.

Q9 Could digital twins eventually support financing or investment structures?

Potentially. Where digital twins generate predictable commercial value and operate within robust governance frameworks, they may increasingly resemble other categories of intangible asset capable of supporting investment and financing activity.

Q10 Why is the Isle of Man associated with Data Asset Foundations?

The Isle of Man has established one of the first statutory frameworks specifically designed to support governed data assets through formal legal structures, registration systems and embedded governance standards.

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