

‘SAY HELLO’

Welcome the World’s 1st Digital Twin for Banks

A Percipient Product Paper

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TWIN™

1. EXECUTIVE SUMMARY

A world first, the Twinn™ lets organisations build ultra-modern digital journeys at an accelerated pace. This is achieved by creating a domain-specific and application-ready representation of the organisation's customer data. There is no need to overhaul, and no impact on, legacy systems.

Twinn™ does this by creating a powerful, application-ready representation of an enterprise's data.



A Well Thought Thru Product Journey

The Twinn™ was developed to address the challenges of digital transformation encountered by financial services organisations.

Prior to the Twinn™, Percipient had launched UniConnect 1.0 in 2017 followed by UniConnect 2.0. The central premise underpinning these two products - that a core ingredient for AI-powered digital outcomes is the ability to integrate its data - has been borne out over the past few years.

Once crippled by deeply-entrenched data siloes, users of UniConnect 1.0 and 2.0 are able to access stored and transactional data. This is made possible by leveraging the UniConnect suite of data virtualisation and API tools.

Technical Debt

But even organisations that are able to overcome their data integration difficulties continue to struggle with their aging IT, that is, the use of short term fixes over longer term legacy transformation. Like financial debt, many organisations “borrow against the future” by adopting tactical workarounds to tackle digital initiatives. However, such debt must be repaid, and sooner rather than later.



Meanwhile, the tipping point for modernisation has sped up over the past few years. Digital enhancement cycles have been squeezed from years to months, and as a result, spends have necessarily ballooned. Gartner estimates that this year, every dollar spent on digital business innovation will require at least three dollars to be spent on modernizing legacy application portfolios.

On the other hand, the potential rewards that digital transformation bring have multiplied in a post COVID-19 world. A large percentage of customers took to their banks' digital services for the very first time driven by the lockdown. But banks should not assume that this crisis-induced change in banking behaviour is permanent or that their customers will stay loyal. That said, those able to capitalise on this change have much more to gain than even just a year ago.

Unlike industrial companies, which seek to convert physical processes into virtual models, service organisations look to build their models from data generated by human behaviour.



2. INTRODUCTION

Rather than enabling a virtual representation of a product or process, Percipient's Twinn™ enables a virtual representation of a customer. This representation is based on data generated by all of the customer's interactions, and across all touchpoints.

What-If Digital Transformation

To help banks achieve digital transformation in the most accelerated and cost effective way possible, Percipient adopts a unique digital twin approach popularised by industrial companies in sectors as diverse as car production, wind farms, oil and gas, aerospace and city infrastructure.

The industrial world is dominated by complex machines, each comprising thousands of components. In the past, identifying points of failure would require the entire machine, or even the entire plant, to be shut down. The same was true of scheduled maintenance cycles. Even new product launches caused normal operations to be halted for testing to take place. Meanwhile, the plant remained reliant on the knowledge and skills of a few highly experienced personnel.

More recently, many leading manufacturers have realised that digital models of each machine and/or each product, combined with AI tools, offer a cheaper, more efficient way to diagnose problems and design new products.

These virtual replicas of their factories and machines, aided by IoTs, are used to understand, predict and improve product performance without affecting the factory's operations. Outages can be predicted before they happen, and products can be monitored across their entire lifecycle.

Service-Based Digital Twin Technology

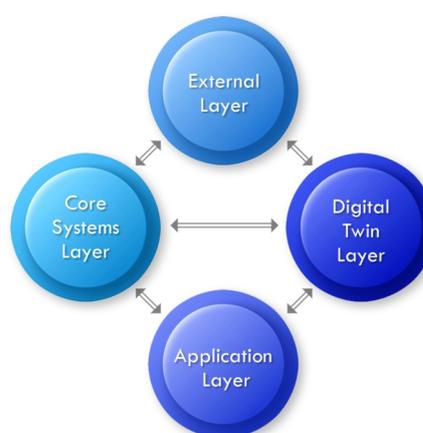
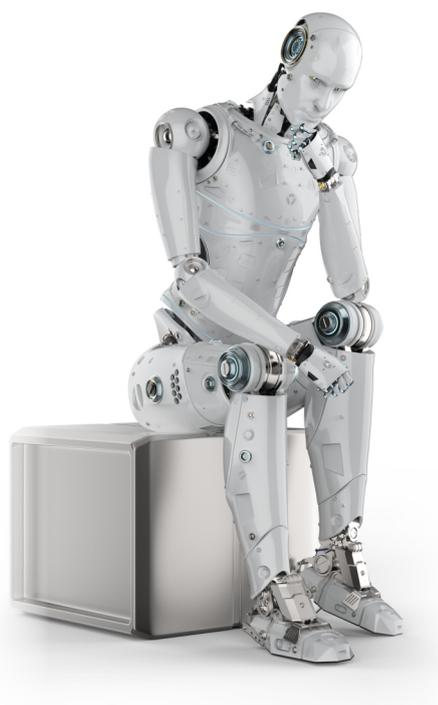
While the digital twin approach has not been widely applied by service organisations yet, the world is waking up to its power.

Unlike the commodity-based digital twin, which is a virtual model built to represent the behaviour of physical objects or processes, Percipient's services-based digital twin is a virtual model built to represent the behaviour of specific customer groups based on their everyday activities, real-time context and interactions.

However, for a services-based digital twin to deliver real value to a services organisation, it must be geared towards the creation of innovative and interactive domain-specific customer journeys.

This requires certain prerequisites to be met:

1. The twin must offer three levels of data synchronicity, ie to core transaction systems, to external data sources, and to data applications.



2. The twin must enable bi-directional data flows, and therefore communication across all four layers, in real-time or near real-time.
3. The twin must ensure that data is organised in a way that supports current business processes and logic, while facilitating innovation.
4. The twin must provide access to data generated across the customer's entire lifecycle, but also by the customer's immediate activities.
5. The twin must act as a high-fidelity representation and single source of truth for multiple objectives, and therefore multiple users and personas.
6. The twin must ensure tight controls are in place so that replicated data is secure, reliable and audit able.

Beyond Traditional Use Cases

Armed with these prerequisites, it is possible for service organisations to realise some of their most desired yet intractable digital ambitions.

- **Customer 360++**

Constructing a profile of an individual over an extended period is standard practice across industry sectors. However, digital twin technology enables organisations to create digital copies of individuals, track their real world interactions, and incorporate that real world data. This can help improve a variety of industries & use cases for example facilitate, real-time marketing offers, and even prevent accidents.

- **Hyper-Personalised Experiences**

To date, AI is applied on distinct elements within a customer's transaction journey, such as selection, fulfilment, rewards. The digital twin can help expand the scope of transaction-based AI to cover processes well before/after the transaction, as well as incorporating real-time and third party data. This includes past product usage, service histories, cross-merchant purchases, real-time geo-location, asset price movements, dynamic pricing, amongst others.

- **Digital Assistants**

A key use of digital twin technology is in the design and development of virtual representations of existing manual processes. For example, in a bank, the availability of historic data collected via both branch and online interactions, coupled with real-time transactional data, opens the door to highly engaged chatbots capable of predicting queries and fulfilling personalised requests.

- **Simulated Cyber-attacks**

A digital twin lets organisations power their digital applications without exposing its core transaction systems to the outside world. Furthermore, the twin can be used to assess the security of core systems against malicious attacks. This is done by internal or external “hackers” testing the defenses of the twin by creating different types of viruses and anti-virus software.



Digital twin technology enables organisations to create digital copies of individuals' real world behaviour and interactions coupled with third party data.

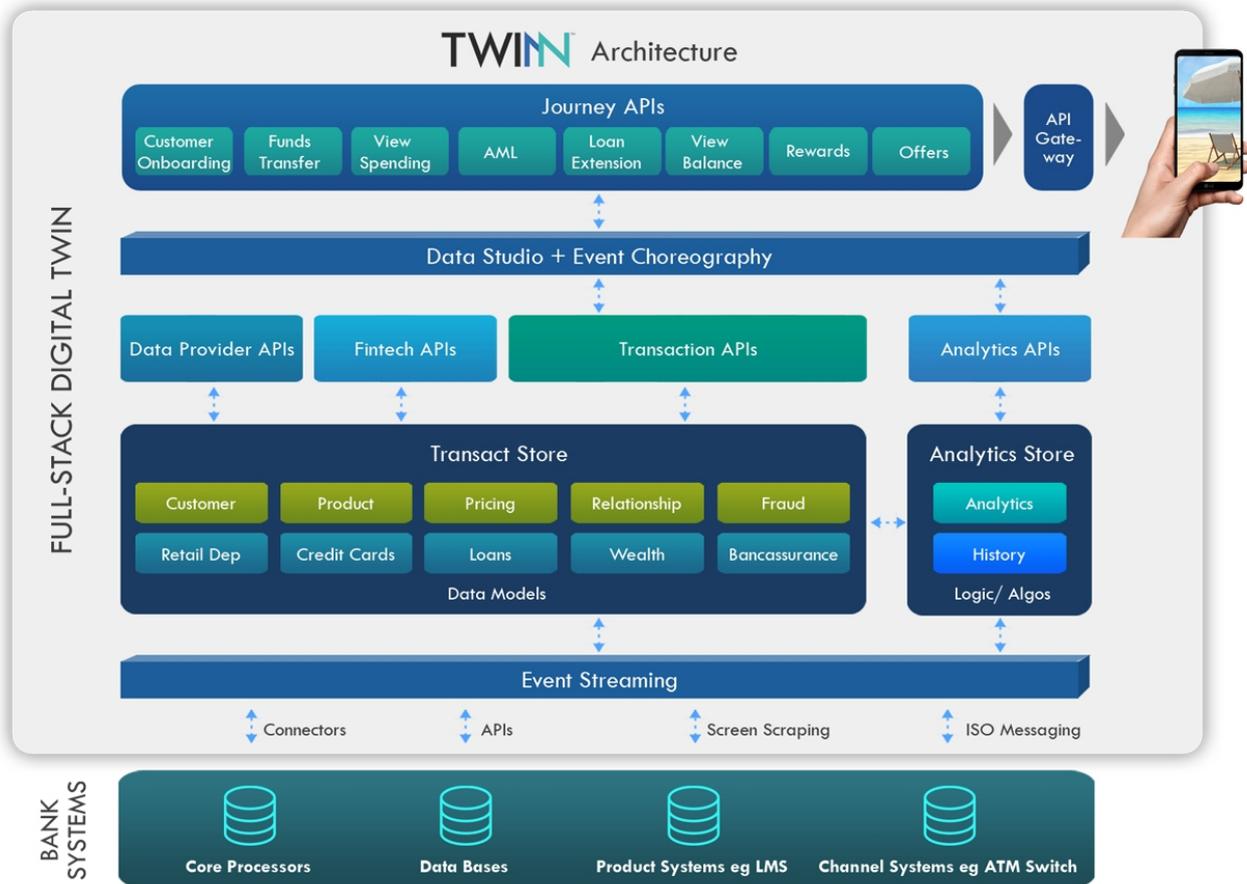
3. ARCHITECTURE AND FUNCTIONALITIES

The Twinn™ lets organisations implement a “living” digital twin architecture, that is, a real-time representation of their most up-to-date customer data and business logic across their entire ecosystem. This data remains ready-to-deploy via pre-designed APIs.

The Twinn™ serves as an application-ready, augmented and a hyper-manifestation of enterprise data. This allows organisations to explore new business opportunities, model new algorithms, design new customer journeys and test new processes without replacing core systems or interrupting existing operations.

The central components of the Twinn™ are shown on next page:





Domain Components

1. Pre-Built Transactional and Analytical APIs

The data ecosystem enabled by the Twinn™ is exposed as a rich set of out-of-the-box APIs.

To ensure that digital projects can be launched within an accelerated time-to-value, it is imperative that organisations maintain a set of APIs that are both business-relevant and ready-to-execute.

However, this requires a tricky balance of IT and business ownership. The former is needed to drive API governance and scalability, while the latter is needed to drive alignment with business outcomes.

The Twinn™ helps to overcome this organisational push-and-pull by offering a catalogue of ready-made APIs that reflect granular-level key business processes and analytics, for example authorization, account opening, fund disbursement, budgeting, AML, spending patterns, etc.

These APIs draw from multiple data sources within an organisation's ecosystem, pre-unified into a single source and truth-consistent.

2. Pre-Built Customer Experience APIs

The Twinn™ solution includes customer journeys designed to deliver compelling customer experiences.

By continuously monitoring incoming events, organisations are able to take real-time business actions

Digital applications are powered by data accessed from legacy systems. However, to deliver value, digital apps must do much more. They must ensure that users enjoy positive customer experiences combined into high-satisfaction digital journeys.

The Twinn™ solution addresses this by bringing deep domain knowledge to bear in the design of innovative digital journeys for lending, credit cards, AML, funds transfer and more. These journeys are underpinned by key design principles such as contact-free processing, minimal customer input, instant usability and minimal application cycle time.

While such journeys are instinctive at the front-end, they are likely to be complex at the back, with many APIs involved. The Twinn™ is able to mask such complexity via API choreography. Choreography is the process by which APIs are loosely coupled and each one can act asynchronously. By using a microservices “broker” rather than “conductor”, the Twinn™ enables journeys that focus on the customer experience rather than the technical orchestration of APIs.

Twinn™ allows accelerated development of algorithms and APIs.

3. Domain-Specific Logical Data Models

The Twinn™ uses domain-specific logical data models to enable agnosticity across systems and sources.

The process of creating data models across traditional and new age data sources, and in a way that supports multiple consumption patterns, can take many months. It is one of the primary stumbling blocks for taking innovative ideas to market.

The Twinn™ offers a pre-packaged set of logical data models that recognise the detailed data structures and rules prevalent within a domain, but is independent of the sources of data used to populate these models.

Consumer Banking is one of the business domains strongly supported by the Twinn™. It incorporates logical data models that includes both core system-generated and externally-generated datasets. This allows for the accelerated development of algorithms and APIs.

Technical Components

1. Data Fabric Architecture

The Twinn™ helps shield organisations from data heterogeneity and data management complexities.

Data management tools abound, yet data management has never been more challenging. In order to derive value from their data assets, organisations today must overcome a series of data management challenges, including data cleaning, data prep, data transformation, etc. This amid ever-increasing volume, velocity and multi-locality of data.

The Twinn™ makes available a consistent data management paradigm that supports:

- a toolbox of 100+ stream and batch connectors and patterns
- the integration of data-at-rest and data-in-motion



- immutable snapshots of all data updates for audit purposes
- multi-modal data storage and data exposition
- metadata-based permissions and access controls



2. Event-Driven

The Twinn™ provides for the real-time capture, processing and routing of change events.

Change events can be an online transaction, an order fulfilment, or a sensor output. Rather than relying on the traditional data request model, the Twinn™ solution includes an Event Hub that asynchronously detects, routes and processes change events.

The Twinn™ enables change events, in the form of modern stream messages, to be ingested. The Event Hub ensures that these change events are used to update the Twinn's data repositories in real-time. By doing so, multiple services are able to access updated data simultaneously but independently of each other. The Event Hub is also able to apply business rules to streaming event data.

By continuously monitoring incoming events and applying business logic to these events, it is possible to build highly intelligent customer journeys. For example, the Twinn™ can help organisations automate a real-time credit approval process, offer product recommendations in response to a customer's immediate location, or detect fraud before a transaction is processed.

By continuously monitoring incoming events and applying business logic to these events, it is possible to build highly intelligent customer journeys.

3. Microservices Framework

The Twinn™ supports lightweight, microservices-based and cloud-neutral computing patterns.

To date, many enterprises continue to rely on monolithic platforms and SOA (Service-Oriented Architecture) techniques to run their digital offerings. These cannot achieve the speed, scalability and reliability required by modern applications.

Percipient's Twinn™ enables organisations to operate a microservices framework. It is the means by which an organisation is able to power its applications using services that serve distinct business purposes. Each microservice is treated as an independent component that can be subsequently replaced or upgraded as required. Microservices can also be easily decoupled from each other such that the application as a whole can be continuously modified, and scaled up or down.

Furthermore, a microservices framework allows organisations to leverage internal, partner, fintech and open APIs. These can be re-used across different applications, and are not tied to a specific project.

The Twinn™ is containerised, and can be run on any cloud environment.

4. AI Enabled

By helping create a consolidated, "always-on", and synthesised data store, the Twinn™ facilitates continuous analytics.

The Twinn™ is designed to consolidate not just internal data, but data sourced from partners, suppliers, agents, research houses and Open-API providers. The Twinn™ solution therefore offers not just a representation of the data at the core of an organisation, but also at its margins.

This representation is not a mirror image of legacy data models. Rather, the data is organised according to logical domain data models, with the data continuously updated in real-time. This makes the Twinn™ eminently suitable to support AI-driven deployments. AI projects can be planned, built and tested by leveraging the data enabled by the Twinn™, and the resulting data stored for ML training purposes.

The real-timeness of the data enabled by the Twinn™ can be further leveraged to support continuous intelligence, that is, the incorporation of AI into real-time customer journeys. Yet, because the Twinn™ abstracts the servicing layer required to support these journeys, core product processors are not directly impacted.

4. CONCLUSION



Percipient's Twinn™ provides organisations with the opportunity to :

- make digital-first strategies a reality faster
- accelerate the launch of top-notch digital journeys
- enable superior customer experiences that are backed by AI
- shrink investments needed to upgrade legacy systems
- shift from lagged to real-time customer interactions
- draw on a golden source of truth across all business verticals
- shield core product systems from intrusion and attacks
- monetise digital assets

