

Xenomorph Case Study

Hartford Investment Management Company

“Many other firms still believe that having the best-of-breed analytics solves their risk management problems – unfortunately this is only part of the solution. Without the right data there are no analytics; without analytics there is no risk management.”

From the get go, HIMCO recognized the need to get the right data at the right time to the right place and selected TimeScape to help transform data into information that the business can use for effective risk management.”

Naj Alavi, Managing Director, Xenomorph

EXECUTIVE SUMMARY

Country/Region: United States

Industry: Financial Services, Insurance and Investments

Customer Profile:

Hartford Investment Management Company (HIMCO) is a subsidiary of The Hartford and invests in a variety of complex assets and derivatives.

Business Situation:

HIMCO invests in a variety of asset classes that require a selection of input data, market data and model data. HIMCO had developed an in-house solution to manage this data through a process of data capture, viewing of the data and assessing its quality to learn whether it was fit-for-purpose. They wanted to enhance this process to include more flexible data validation and allow for a wider array of validations before data is pushed to the derivative valuation platform for scenario analysis.

Solution:

By implementing Xenomorph's TimeScape analytics and data management platform, HIMCO has been able to enhance:

- the automation of the data capture process from multiple data vendors;
- both simple and complex data validation rules across selected instruments;
- custom business logic.

These enhancements enrich market data before sending it to the derivative valuation platform, now through configurable applications and interfaces rather than raw XML.

BENEFITS

- **Increased efficiency** of market data acquisition, storage and validation and better transparency through TimeScape
- **Empowering** Middle Office staff to monitor data quality, detect priority issues and correct them before that data is needed for Risk Management
- **Customizable** functionality to extend data validation beyond the norm and provide data enrichment where data is illiquid or simply not quoted
- **Transparent**, open-API to allow HIMCO to build their own dashboard and custom functionality to blend into the daily process
- **Automated** and configurable 'push' to derivative valuation platform requiring less time from IT to maintain this process

"One of the key decisions for implementing TimeScape was its ability to be flexible enough to handle complex data management. It is not just about storage of such data, including many different types of curves, matrices, skews and schedules, but the ability to validate and enrich the data using custom HIMCO logic and algorithms.

TimeScape's extensibility is intended to empower the HIMCO Middle Office team to validate a wide array of data and verify that it is correct, complete and fit-for-purpose before being used within the risk management process."

Mark Woodgate, Founding Partner, Xenomorph

INTRODUCTION

HIMCO invests in a variety of complex assets and derivatives, including credit, FX and various futures and swaps. Such asset classes require a variety of input data, market data and model data such as volatilities, correlations, curves, spread curves and more complex datasets such as swaption skews.

SITUATION

HIMCO invests in a variety of asset classes that require a selection of input data, market data and model data. HIMCO had developed an in-house solution to manage this data through a process of data capture, viewing of the data and assessing its quality to learn whether it was fit-for-purpose. A key issue was the management of market data, for which HIMCO had implemented its own database solution to capture data sourced from various industry-standard vendors as well as internally-generated data. This solution required detailed knowledge of the database and had no supporting GUIs to browse the actual data.

Furthermore, the derivative valuation platform was able to accept only data produced in large, complex XML files that required detailed knowledge of how the derivative valuation platform works internally. Such files had to be produced in the required format and order by a custom HIMCO C# application.

HIMCO decided to investigate potential vendor solutions that would:

1. Provide fast, efficient, flexible, transparent and centralized storage of market data
2. Allow data of all types to be validated and corrected where necessary; missing or illiquid data to be generated and/or enriched
3. Enable integration with its derivative valuation platform to be automated and configurable

SOLUTION

HIMCO selected Xenomorph's TimeScope to help satisfy its requirements.

Implementation was carried out in stages, the first part being the capture and storage of market data including:

- **Prices / Rates** – sourced externally including index spots, FX spots, future spots, basis swaps, fixings, swap rates, cap volatilities, FX forwards, inflation swaps, FX volatilities, swaption volatilities (ATM), overnight indexed swaps
- **Swaption Skews** – sourced externally
- **Credit Data** – sourced externally including CDS Spreads, CDX Quotes, Tranche Quotes and Base Correlations
- **Internal Data** – including index volatilities, dividend swap schedules and volatility spreads and various correlations

Once the market data capture had been automated, the next part was data validation, and to focus primarily on what is needed to remove 'false positives':

- **Prices / Rates** – Simple validation, based on gaps (taking into account holiday calendars), flat spots and percentage or absolute limits on day-to-day changes
- **Surfaces** – Custom validation to compare tenor pair values internally within various surfaces, and also day-to-day changes historically for given tenor pairs
- **CDS Spreads** – Ability to validate CDS Spreads but only those traded as opposed to the entire universe (some 15,000+)

All of the exceptions produced by these validation tests produced similarly formatted output which was then incorporated within a dashboard to report such exceptions and allow their correction.

Prior to the (validated) data being passed to the derivative valuation platform, the data was further enriched as follows:

- **Prices / Rates** – Built-in TimeScape missing value rules allow gaps to be filled if required to ensure there are no critical missing points for trade valuations
- **Surface Transformations** – An external vendor supplies surface data at an individual ticker level. These need to be transformed using TimeScape SpreadSheet Inside Technology into a complete surface on any given trade date. This includes transformations from Butterfly-Risk Reversal format to Put/Call format
- **Surface Filling** – Any missing tenor pair values not quoted for ATM swaption volatilities and swaption skews are filled centrally within TimeScape; this ensures a 'full' surface/cube for trade valuations
- **Curve Construction** – Individual tickers from an external vendor are combined within TimeScape to form yield curves, OIS curves, basis swap curves, repo curves, credit spread curves and real rate curves. Such compositions can vary historically and curves that are formed from illiquid currency pairs (e.g. SGD/JPY) that are not directly quoted are synthesized from splicing other currency pairs that are quoted

The final part of the implementation was to make the market data available to the derivative valuation platform. The key features of this were:

- **Automated** – The 'push', once scheduled, requires no manual intervention. Internal staff monitor the process and respond to issues that may arise
- **Configurable** – Each data set (e.g. yield curves) can be processed independently if required. This allows different data sets to be pushed as the market data becomes available
- **Transparent** – For regulatory purposes, all market data is stored historically in TimeScape; if there is a requirement to re-value trades at a point in the past, the push can be configured to run as of a particular (past) date

BENEFITS

- **Increased efficiency** of market data acquisition, storage and validation through TimeScape
- **Greater transparency** of market data across the organization
- **Empowering** Middle Office staff to monitor data quality, detect priority issues and correct them before that data is needed for Risk Management
- **Customizable** functionality to extend data validation beyond the norm and provide data enrichment where data is illiquid or simply not quoted
- **Automated** and configurable 'push' to derivative valuation platform requiring less time from IT to maintain this process

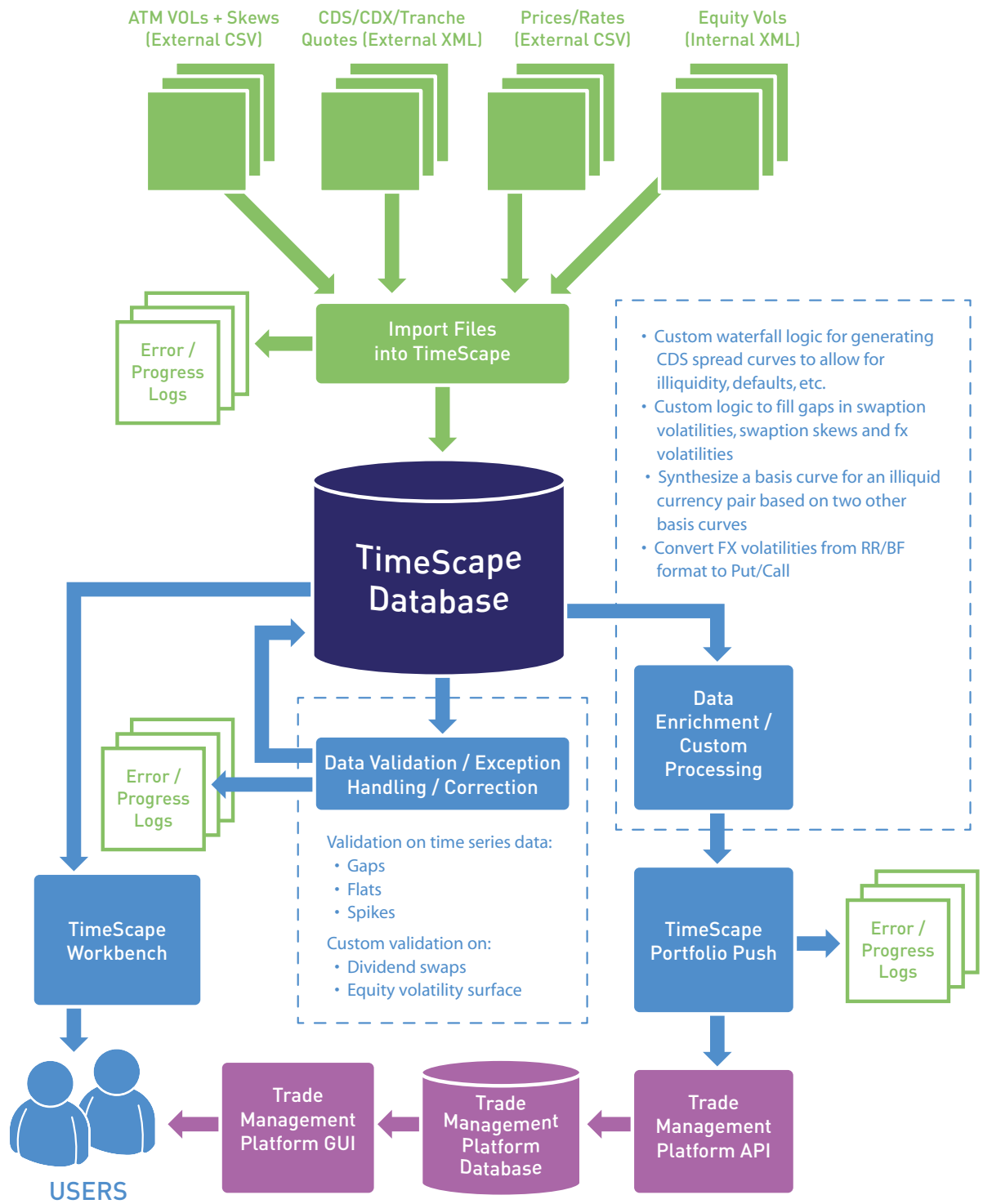


Figure 1. The TimeScale solution implemented at HIMCO

ABOUT XENOMORPH

Xenomorph provides trusted data management solutions to many of the world's leading financial institutions.

The company has more than two decades' experience managing large volumes of complex data and analytics.

Over that time, we have consistently reinvested in our technology, culminating in our latest generation enterprise data management platform TimeScape EDM+.

Our software is built to be future-proof. With our rules-based single-stack architecture, flexible data model, easily configurable workflow engine and integrated feature updates, TimeScape EDM+ empowers you to address any future requirements. It can be operated by business users without any prior programming expertise, which means it offers a truly agile and cost effective solution to address evolving business, regulatory and technology trends.

The platform also excels at managing and validating model-derived data, thereby enabling firms to address their model risk management challenges by making sure inputs and outputs of business critical models are always validated and kept in sync.

For more information on Xenomorph, our clients, services and solutions, please see www.xenomorph.com.