

# Identifying illicit activity through financial transactions

Architectural approaches for fast, effective transaction analysis



To shield against emerging threats from sources such as rogue states, terrorist groups, organized crime and disaffected internal elements, financial intelligence units (FIUs) need to use financial intelligence (FI) solutions to collate and analyze information from multiple source systems. This paper presents the two fundamental architectural approaches for FI solutions – the database-centric and application-centric approaches. It will be argued that abstracting financial data sources in an application layer provides the optimal flexibility, scalability and performance required to integrate data from multiple, heterogeneous source systems for analysis in an FI solution.

## Introduction

Today, complex networks of rogue states, terrorist groups, organized crime and disaffected internal elements pose an increasing risk to global security. To develop effective early-warning systems to guard against emerging threats, intelligence agencies around the world rely on information gathered from multiple disciplines to build up detailed patterns of illicit activity. One of the major disciplines is financial intelligence, in which evidence of illicit financial transactions is used to provide insight into the activities, plans and behavior of individuals, groups or states, and into the connections between them.

Because key evidence of threats may lie in identifying and understanding the relationships between a large number of financial transactions, gaining accurate insight requires financial intelligence units (FIUs) to analyze financial data from multiple different sources – including banks, insurance companies and other financial services providers.

Increasing the number of financial source systems for analysis dramatically improves the quality and consistency of intelligence. Unlike big data – where complex, unstructured datasets are mined for statistical correlations to identify hidden trends – FIUs need to analyze highly structured data against a strict set of business logic. FIUs know exactly what they are looking for; as a result, the tools traditionally associated with big data are not applicable.

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## Challenge

To deliver actionable intelligence, FIUs need specialized financial intelligence (FI) solutions to collate and analyze data from multiple source systems.

Choosing the underlying architecture for the FI platform is an important decision, as it will ultimately determine the performance, scalability and future utility of the solution. There are essentially two architectural approaches to developing a FI platform – the database-centric approach and the application-centric approach.

## Database-centric approach

When faced with the challenge of developing a platform for FI, using a database-centric solution often seems a tempting option; databases are, after all, a proven method for efficiently managing large quantities of data.

A database-centric architecture initially appears to offer quick results, low costs and efficient use of hardware resources; however, the inflexibility of the platform means that those adopting a database approach for an FI platform will quickly encounter challenges.

Although databases can efficiently store and retrieve large amounts of data, the sheer number and variety of data sources required for FI creates enormous complexity. This complexity only becomes apparent when attempting to add data from new sources.

For example, suppose that an FIU requests transaction data from three banks, and designs a database specifically for the purpose of analyzing this data. If the results of the initial analysis show indications of illicit transactions, the FIU will have to add additional data sources to enrich its analysis and confirm its suspicions. However, data from different sources will often violate many of the assumptions that were defined when the database was first built. In this case, the database will need to be extensively re-designed to accommodate the new data sources – a complex, time-consuming and costly process.

Re-designing a database to accommodate data from new source systems is complicated by the architecture of platform. Although using domain-specific languages such as SQL make it relatively simple to query a relational database, they lack the versatility of high-level languages.

The ability to add new data sources quickly and easily is a prerequisite for a successful FI solution. For this reason, FIUs should consider an alternative approach when choosing the underlying architecture of their system.

## Application-centric approach

Application-centric approaches to FI solve many of the challenges of a database-centric approach. By abstracting the source data using an application layer, it is simple for FIUs to integrate new data sources. Because the source data remains unchanged, FIUs can also modify the business logic of their FI solution quickly using high-level programming languages.

With more data sources available for analysis, FIUs have a more complete picture. Furthermore, the ability to rapidly add new data sources significantly reduces time-to-insight – enabling FIUs to increase the number of investigations they can conduct each year.

Although applications are not typically suited to managing large quantities of data, using workload parallelization and in-memory processing enables application-centric FI solutions to complete complex transaction analyses at a speed equivalent to database-centric solutions. However, the cost and time required to design, build and configure an application of this kind are high.

## Conclusion

The two approaches outlined above both aim to make it possible to build intelligence through the analysis of complex webs of financial transactions. This white paper argues that an application-centric approach offers the necessary flexibility, scalability and performance required to process financial data from multiple, heterogeneous source systems.

If FIUs decide to adopt the application-centric approach recommended in this paper, they can minimize risk and shorten time-to-value by investing in a turnkey solution pre-configured to meet their unique requirements. ■

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