

# **Enabling Privacy and Preventing Fraud through Identity Verification**



## **An Overview of RAF's Verification Engine**

**Mr. George S. Harbachuk**

Vice President Marketing and Products

RAF Technology, Inc.

425.867.0700

[george.harbachuk@raf.com](mailto:george.harbachuk@raf.com)

## RAF's Verification Engine™ Validates Identities With Simultaneous, Coordinated Querying of Multiple Databases

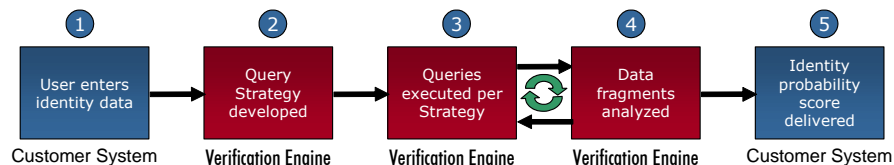
### Overview

The Verification Engine was created to address the problem of incorrect or missing data in commercial datasources. Verification against commercial datasources is only as reliable as the data contained therein. RAF recognized that all commercial datasources have incomplete or incorrect data. However, not all commercial datasources have the same incorrect or incomplete data. Therefore, it becomes necessary to compare the users's data with several combined sources before authorizing or rejecting verification.

For 6 years, RAF has supplied a patented identity verification plug-in solution to the US Department of the Treasury, underpinning Treasury's Pay.gov website, and to the US Postal Service. The Verification Engine is used by both agencies (and through Treasury by many others) to validate personal and commercial identities. It enables secure access to sensitive databases that would normally be difficult to query for privacy reasons. In a nutshell, the Verification Engine securely connects and integrates in real-time disparate databases containing different fragments of identity data. From the combined information, it calculates the probability that the claimed identity is real and belongs to the entity requesting system access. For each identity validation, the Verification Engine calculates a Query Strategy to most economically, efficiently, and effectively validate – or reject – the claimed identity.

### The Verification Process and How It Works

The Verification Engine is designed as a plug-in solution to existing systems. Integration often requires only minor process modifications in addition to integration with the databases required for the new process. Once implemented, the typical process works as follows.



The user is prompted via a web interface to enter data related to his/her identity and to the transaction he/she seeks to execute.



Currently, the Treasury is using the following pieces of data for verification; these are easily modified or expanded based customer requirements:

Personal Data		
Name	Telephone Number	Bank Account Number
Address	Date of Birth	Driver's License
Social Security Number		

Business Data		
Business Name	Telephone Number	Bank Account Number
Business Address	Duns Number	Tax Id Number / EIN
Contact Name	SIC Code	Parent Company
Contact Email	Incorporation Date	

Once the user has entered the requested identity data, the Verification Engine develops a custom Query Strategy that determines the priority and order in which the required data is accessed to develop the probability score.

Every Query Strategy comprises sophisticated algorithms designed to optimize three query components: effectiveness, efficiency, and economy.

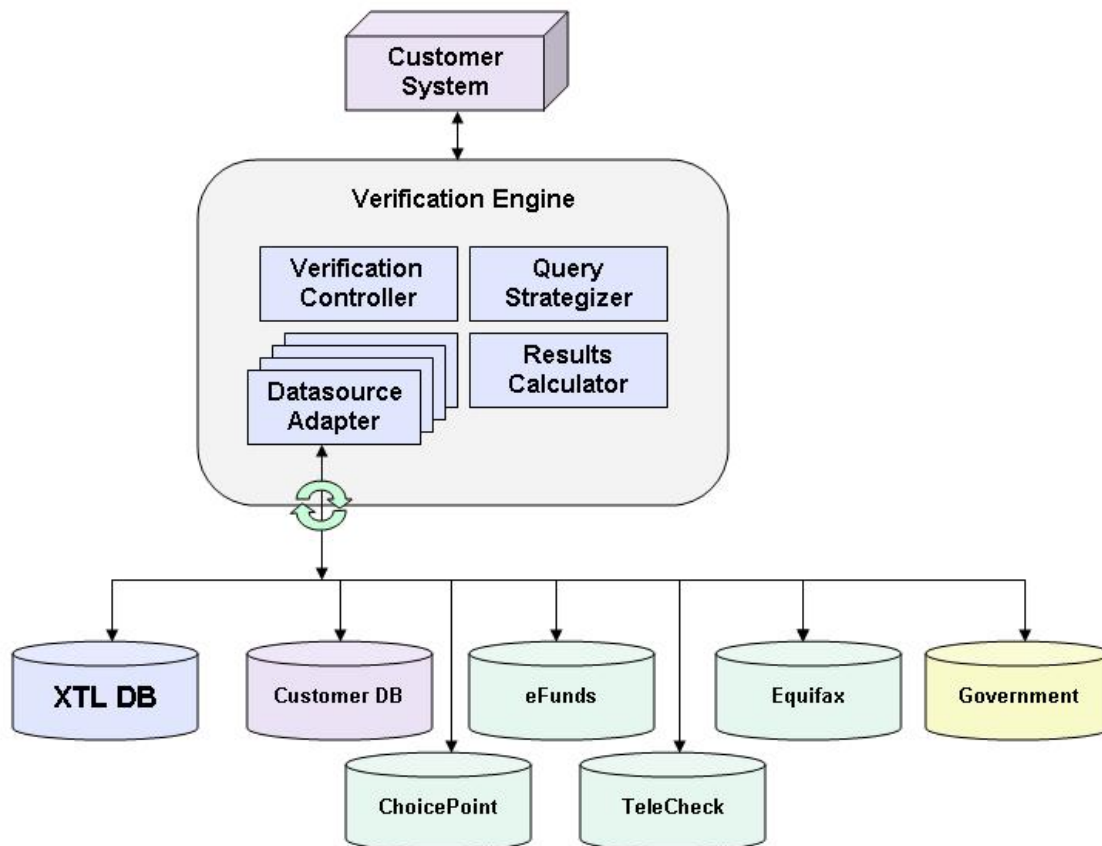
1. **Effectiveness** of the Query Strategy determines the robustness of the probability score. The Query Strategy generated is extensive containing many permutations for retrieving the necessary number of data elements. The Verification Engine executes the Query Strategy until a sufficient set of data fragments have been collected to calculate a reliable Identity Probability Score, database resources have been exhausted, or allotted time exceeded.
2. **Efficiency** of the Query Strategy directly impacts the duration of the query execution, which translates into user performance. The fewer data sources that are needed, the faster a score will be delivered. The Query Strategy is optimized to use as few data sources as possible.
3. **Economy** of the Query Strategy addresses the cost of each query. Typically data providers charge per query so the Query Strategy uses cost as a component when calculating both the optimal efficiency and effectiveness.

While the results of the database queries are being received, the system continually calculates the validation score. Once customer-determined accept or reject targets are exceeded (or resources exhausted) the final score is incorporated into the system's validation model.

## Architecture and Data Security

The Verification Engine is an n-tier J2EE 2.0 compliant application. It has been fully certified on Weblogic, JBOSS, and Websphere, and on both Solaris and Linux operating systems. As a J2EE application, it is easily adaptable to other J2EE containers and operating systems. Interfaces to the system are all XML/HTTP (with schema validation). Ease of integration was designed into the system from the outset. The diagram on the following page depicts the high-level architecture.

High-level architecture of the Verification Engine (as deployed at the Treasury)



For the Treasury, the Verification Engine currently processes data elements from ChoicePoint, Equifax, TeleCheck, and eFunds (proprietary databases whose access and usage are tightly controlled), various government sources, and RAF's own XTL database containing USPS provided names and addresses. The system has proven straightforward to extend to additional data sources as well as alter interfaces to emerging specifications of existing datasource providers. The platform makes use of a datasource adapter SDK that allows RAF to integrate new datasources in to the platform with minimal impact to cost and schedule.

These data providers, and most others that have sensitive personal and financial data, have rigid restrictions on how the data can be accessed, used and stored. The commercial providers are particularly sensitive when the data is to be used in conjunction with direct competitors' data, while the government sources are very concerned with data privacy and sensitivity. The Verification Engine accommodates these stringent and difficult requirements through its patented and highly structured querying approach. Only pre-defined queries, pre-contracted with the data source provider, can be processed. All data extracted from any system except the validation score is removed at the end of each query. Paradoxically, because the Verification Engine customer is never in possession of this sensitive data, they get the benefits of using data that would normally be unavailable to them.

The secret to data protection in the Verification Engine is this absolute restriction on how that data can be accessed. Not only is all access to the data limited to the Verification Engine and not passed on to the customer or the user, the data itself can only be retrieved according to the above-mentioned pre-defined, enforceable queries. If a query has not been specifically authorized by both the Verification Engine and the database provider, it cannot be executed by



anyone. This provides extremely strong security and the ability to pre-define which types and fields of data are permitted to be accessed together, and which types of data or fields can never be combined. For example, Social Security Numbers and bank account numbers could only be seen together if a specific query accessing both fields were built and authorized for mutual retrieval. Because the Verification Engine does not have a variable query language, if such a query were not authorized, such information could not be combined by our system.

## **Summary**

RAF's Verification Engine is a mature identity authentication and data security plug-in solution in its 4<sup>th</sup> generation of deployment in sensitive government and commercial applications. The Verification Engine makes it possible to connect many data sources that otherwise would not be mutually accessible. While controlling and protecting the data behind the decision the Verification Engine allows customers to efficiently, effectively and economically verify personal and business identities.

## **About RAF**

RAF Technology, Inc. is a world-wide leader in advanced pattern and image recognition, intelligent information extraction and data verification solutions for enterprises, government agencies and postal authorities.