

Identity Search and Match Use Case

Identity of a person is a set of unique characteristics that define an individual. This information becomes a foundation to recognise the person for the benefit of:

- Security
 - Border control enforcements
 - Criminal record checks
 - Corporate Access Control
- Customer Relationship Management
 - Customer Loyalty Programmes
 - Verifying Credit History
 - Patient Healthcare
- Fraud prevention
 - Identity Thefts
 - Transaction Monitoring
- Locating missing persons
 - Natural Disasters
 - Criminal activities

In today's world the drive to capture personal data has resulted in a multitude of systems holding the identity of an individual.

The need for extracting key information for comparison, data harmonisation, de-duplication, fraud investigations and testing data quality is greater than ever. The need to make the most of the data available to an organisation is becoming increasingly apparent. The opportunities available to gain the edge over the competition need to be realised. Accuracy of data matching and retrieval are the key differentiators and selection of a tool that is simple, effective and straightforward is the critical success factor for each and every implementation.

Data is the heart of nearly every operation in today's complex business environment. Getting correct, relevant and complete data in a timely manner is critical for almost all business operations. Concorde Search uses industry knowledge, technical expertise and intellectual property to enable our customers to achieve increased operational efficiencies, better decision making and superior customer service.

At NouveauTech, we apply lateral thinking, quality procedures and technical expertise to each and every customer engagement.

Concorde Search is a fast, scalable, easy to use, customisable and configurable search solution for Identity Search and Match.



Concorde Search: The Solution for Identity Search and Match

Concorde Search Solution provides the capability of finding the relevant identity information across your organisation's disparate information repositories. The software provides a simple and effective interface to search using full-text (fuzzy) search, structured search and analytics. The management functions provide the capability to configure, secure and audit the utilisation of the search engine to meet the goals of the implementation.

Why Concorde Search?

Concorde Search Solution is developed to bring the technology to the end users. Concorde Search offers tools that simplify the adoption of complex algorithms for data searching and matching techniques. The solution empowers IT users with the ability to configure, administrator and operate the implementation using the out-of-the-box features. The product provides well defined web service interfaces to aid uncomplicated integration using industry standard techniques. The ability to tune the engine using the experience from the organisation for its specific implementation not only improves the results, but allows the organisation to expand the use of this technology to get a better return for its investment.

Concorde Search solution aims to keep the operation of **Search and Match** as a single atomic step to the end user. Let us define what Search and Match operations are individually with the following example:

If the requirement is to search for the identities matching the following criteria: (FirstName: 'CHRISTIANA', LastName: 'MINUGH', DocumentID: 'Y100588271', DOB: '09-06-1967')

Field Name	Search Filter Type	Search Value	Field Weightage	Action
FirstName	FUZZY	CHRISTIANA	30	+
LastName	FUZZY	MINUGH	30	+
DocumentID	FUZZY	Y100588271	20	+
DOB	EXACT	1967-06-09	20	+

score	PersonID	FirstName	LastName	FullName	FirstName_Ar	LastName_Ar	FullName_Ar	DocumentID	Gender	COB	POB	DOB	DocumentType	Nationality
100.0	39723373	CHRISTIANA	MINUGH	CHRISTIANA ROLLAND MINUGH	کریستینا	مینوگ	کریستینا	Y100588271	F	POL	Warsaw	1967-06-09	O	POL
57.9	39722781	CHRISTINE	MINUGH	CHRISTINE NUMBERS MINUGH	کریستین	مینوگ	آرلاند کریستین	N111851047	F	ISR	Jerusalem	1998-01-28	O	ISR
55.5	39733703	CHRISTIANA	MINUGH	CHRISTIANA ROLLAND MINUGH	کریستینا	مینوگ	کریستینا	Y100588271	F	POL	Warsaw	1967-06-09	O	POL

Field Score: DOB (20.0)
AlgorithmWeightagePercentage FieldID FieldIDScore FieldIDValue FieldIDWeightage MatchedCountCorrection MatchedInputTokens ScoreAggregation SearchAlgorithm TotalInputTokens
30.0 DOB 20.0 1967-06-09 20.0 NONE 1 EXACT 1

Field Score: FirstName (30.0)
AlgorithmWeightagePercentage FieldID FieldIDScore FieldIDValue FieldIDWeightage MatchedCountCorrection MatchedInputTokens ScoreAggregation SearchAlgorithm TotalInputTokens
30.0 FirstName 27.0 CHRISTIANA 30.0 NONE 6 PHONETIC 6
30.0 FirstName 3.0 CHRISTIANA 30.0 NONE 5 DISTANCE 5

Field Score: LastName (30.0)
AlgorithmWeightagePercentage FieldID FieldIDScore FieldIDValue FieldIDWeightage MatchedCountCorrection MatchedInputTokens ScoreAggregation SearchAlgorithm TotalInputTokens
30.0 LastName 27.0 MINUGH 30.0 NONE 4 PHONETIC 4
30.0 LastName 3.0 MINUGH 30.0 NONE 5 DISTANCE 5

Field Score: DocumentID (20.0)
AlgorithmWeightagePercentage FieldID FieldIDScore FieldIDValue FieldIDWeightage MatchedCountCorrection MatchedInputTokens ScoreAggregation SearchAlgorithm TotalInputTokens
30.0 DocumentID 20.0 Y100588271 20.0 NONE 1 EXACT 1
30.0 DocumentID 0.0 Y100588271 20.0 NONE 1 DISTANCE 1



Search: The process of searching the repository using the entire criteria supplied by the user. Concorde Search provides various search controls that the users can adjust and tune to control the behaviour of the search without the need for IT support and algorithm experts.

Match: The process of scoring the fetched identities using various scoring algorithms and re-ordering the results based on the score. Concorde Search provides various scoring algorithms out of the box that the user can tune to get the best possible match without the need for IT support and algorithm experts.

In summary, Search and Match operation is a single function for the user (or a consuming app). This negates the need for a multi-step iterative process to locate the information and determine if the retrieved data equates to the specified identity.

Key Features and Functions

- **Customisable Fuzzy Text:** Concorde Search Engine provides a large selection of industry standard Fuzzy search & relevancy scoring algorithms. These enable you to configure and use the scoring algorithms without the need for programming.
- **Flexible and Configurable:** Concorde Search Solution is built to enable the user to use the product on a self-service mode without the need for IT support. Concorde Search offers various “real-time” customisation options that allows the user the ability to configure and tune the engine to give the best possible result for their business. Concorde Search provides the end user with the administrative features to create a repository, load data, tune engines and search repositories. The end user does not have any reliance on the IT technical support to create and maintain the search engine.

The screenshot displays the 'Repository' configuration page. At the top, the 'Repository Name' is 'red_watchlists' and the 'Created On' date is '27/11/2016 11:40:21'. The description is 'highly critical watchlists repository containing the biometric details of targets'.

Below this is the 'Repository Fields' section, which contains a table of field configurations:

Field Name	Field Type	Primary Key	Non-Latin field	Action
PersonID	string	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
FirstName	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
LastName	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
FullName	string	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
FirstName_Ar	string	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="⊞"/>
LastName_Ar	string	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="⊞"/>
FullName_Ar	string	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="⊞"/>
DocumentID	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
Gender	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
COB	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
POB	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
DOB	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
DocumentType	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>
Nationality	string	<input type="checkbox"/>	<input type="checkbox"/>	<input type="button" value="⊞"/>

Below the table is a 'Score Aggregate Function' configuration section:

Field Name	Score Aggregate Function	Action
FirstName	WEIGHTED_SUM	<input type="button" value="⊞"/>

Below that is a 'Search Criteria' configuration section:

Target Field Name	Rule Apply Condition	Transliterate	Search Criteria	Score Condition %	Action
FirstName	For Latin Values	<input type="checkbox"/>	PHONETIC	90.0	<input type="button" value="⊞"/>
FirstName	For Latin Values	<input type="checkbox"/>	NGRAM	10.0	<input type="button" value="⊞"/>

At the bottom, there is another 'Score Aggregate Function' configuration section:

Field Name	Score Aggregate Function	Action
FirstName_Ar	WEIGHTED_SUM	<input type="button" value="⊞"/>
FirstName_Ar	WEIGHTED_SUM	<input type="button" value="⊞"/>

- **Complex Search and Match:** Concorde Search defines and indexes documents as a collection of fields or a composite field holding unstructured text to increase the quality of matching whilst limiting request/response overheads.

- **Highly Indexed Data:** Concorde Search Solution stores indexed data to perform the search and match. Data is held in disparate source databases, designed for storage and transaction processing. To make the data available for effective and efficient search, the user has a choice to import data to Concorde Search repository or reference data via the Concorde Search repository. This provides an option not to hold any sensitive customer data in Concorde Search Solution.
- **Configurable Weightage and Percentage of Algorithm:** Concorde Search lets you specify the bias per field to allow the users to influence the weightage when presenting the query real time. Separate tools are not required to fine tune and maintain the configuration per repository for the search engine.
- **Match Score Illustrations:** Calculations of match scores are based on selected algorithms; this shows the users what has contributed to the score. The results can be used to refine and tune the search as well as match rules to improve the accuracy.
- **Multi-Language Support:** Concorde Search offers search and match capabilities for the data in Latin and Non-Latin languages. Its mature fuzzy logic overcomes phonetic transliteration, missing or out-of-order words and other data variation which include punctuations and delimiters. It also offers flexible transliteration capabilities that can be leveraged by the end-users on a need dependent basis for their search.
- **Results in an Intuitive User Interface:** Concorde Search and match results are listed in the order of relevancy ranking, with breakdown of the match scores being based on the search criteria and defined rules.

Audit Search Filter

Event Type: User System Repository:

Event Name: Event Owner:

Event Date: From To Event Status:

Audit Search Result

(1 of 100) 1 2 3 4 5 6 7 8 9 10

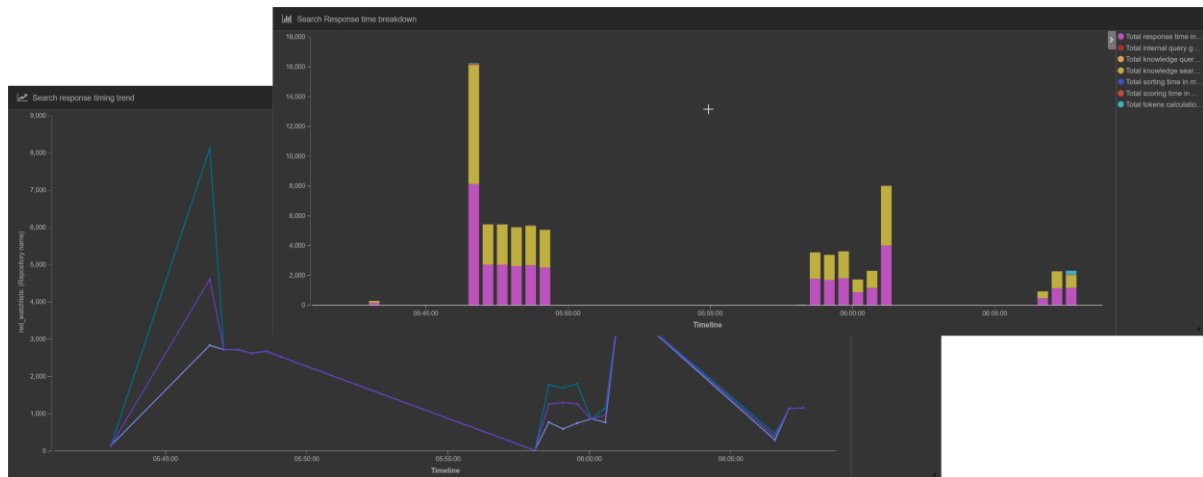
Event Name	Event Type	Event Date	Event Owner	Event Status	Action
Resolver Search	System Event	30/11/2016 06:07:31	sai	Success	<input type="button" value="Audit Record"/>
Resolver Search	System Event	30/11/2016 06:07:11			
Resolver Search	System Event	30/11/2016 06:06:57			
Resolver Search	System Event	30/11/2016 06:06:37			
Resolver Search	System Event	30/11/2016 06:01:27			
Resolver Search	System Event	30/11/2016 06:00:55			
Resolver Search	System Event	30/11/2016 06:00:31			
Resolver Search	System Event	30/11/2016 06:00:15			
Resolver Search	System Event	30/11/2016 05:59:54			
Resolver Search	System Event	30/11/2016 05:59:42			

Audit Event Payload

```

{
  "eventId": "0093eccd-b036-4186-899a-afde618561a8",
  "eventName": "RESOLVER_SEARCH",
  "repositoryName": "red_watchlists",
  "eventType": "SYSTEM_EVENT",
  "eventTimestamp": "201606091797",
  "eventOwner": "sai",
  "eventLogOutputPayload": {
    "request": {
      "minimumScoreThreshold": 0.0,
      "criteria": [ {
        "weightage": 100.0,
        "fieldName": "Fullname_ar",
        "normalizeValue": true,
        "fieldValue": "المكتب التجاري للخدمات",
        "resolveMethod": "FUZZY",
        "mergeField": false
      } ]
    },
    "minScore": 100.0,
    "responseHints": {
      "knowledgeSearchTimeInMilliseconds": 860,
      "totalResponseTimeInMilliseconds": 1197,
      "totalFieldTokenCalculationTimeInMilliseconds": 270,
      "recordsSortingTimeInMilliseconds": 0,
      "knowledgeQueryGenerationTimeInMilliseconds": 5,
      "scoringAlgorithmTimeInMilliseconds": 22,
      "internalQueryGenerationTimeInMilliseconds": 0
    },
    "repository": "red_watchlists",
    "maxScore": 100.0
  },
  "error": false,
  "strEventTimestamp": "30/11/2016 06:07:31",
  "eventDetailsAsString": null,
  "strEventType": "System Event",
  "strEventName": "Resolver Search",
  "eventStatus": "Success"
}
          
```

- **Product Operations Features:** Concorde Search includes Dashboards, Reporting and Monitoring. The operational features allows the user to track response time of the queries, memory usage, monitor the health/performance of the system and provide analytics on the transactions. Once implemented, the solution can be managed by the end user without having to rely on specialist IT technical support.



- **Industry Standard Integration Capability:** The solution offers a platform for seamless integration using RESTful web service interfaces. It integrates with standard user data sources like LDAP and Microsoft Active Directory.
- **Industry Standard Security:** Concorde Search Solution offers off the shelf security for authentication and authorization using robust industry standards.
- **Simplified and Unified Installation Process:** Concorde Search has been designed with a premise to provide a scalable distributed setup that is simple and configurable. Concorde Search configurations and installations are highly automated and are equivalent to the idea of "**single touch deployment**". Installing a true production-like set up of Concorde Search with multiple nodes and clusters can be done in a matter of minutes. Installing Concorde Search on a single developer server verses a production server with multiple nodes uses common installation routines.

For Further information and demonstration, please contact:

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