

<div>
Developer
Day
Series
</div>

Agenda

10:00-10:30 Registration & Coffee

10:30-10:40 Welcome

10:40-11:00 API Strategy Update - Umer Nalla, Developer Advocate, Refinitiv - Jason Ramchandani, Developer Community Manager, Refinitiv

11:00-11:25 New Refinitiv Data Platform API Library (Python, .NET, Typescript) - Umer Nalla, Developer Advocate, Refinitiv

11:25-11:35 Refinitiv Data Platform Demo – Equity and Bond Portfolio News Filtering App - Umer Nalla, Developer Advocate, Refinitiv

11:35-11:45 Refinitiv Data Platform Demo – Creating a Dashboard App using multiple Data Sources - Umer Nalla, Developer Advocate, Refinitiv

11:45-12:00 Coffee Break

12:00-12:35 Eikon Data API / Various Quantitative Notebooks - Jason Ramchandani, Developer Community Manager, Refinitiv

12:35-12:45 New Eikon JupyterHub App - Jason Ramchandani, Developer Community Manager, Refinitiv

12:45-13:15 "AI, Python in Quant Finance" - Dr. Yves Hilpisch, Python Quants

13:15-13:30 Closing Remarks (including survey and T-Shirt)

13:30-14:30 Lunch and Networking

Event Information

Be Safe



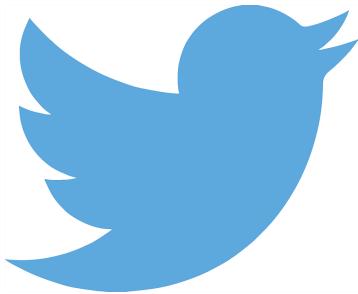
In case of fire, leave via the nearest exit

Get Online



Network:

Visit



@Developers

#TrustedData

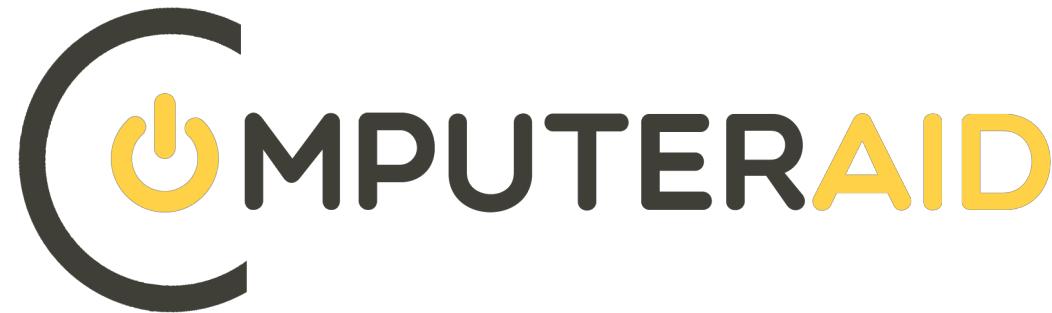
#Refinitiv

Join the Conversation

No Giveaways Here



SUSTAINABLE DEVELOPMENT GOALS



“Since Computer Aid’s founding in 1997, we have brought access to technology to over 14.5 million people. We want to build a world where everyone has equal access to technology.”

www.computeraid.org

Developer experience with the Refinitiv Data Platform, Open Desktop & Open APIs

Jason Ramchandani

Developer Community Manager / Advocate



REFINITIV™


The Refinitiv logo is located in the bottom right corner. It consists of the word "REFINITIV" in a bold, black, sans-serif font, followed by a trademark symbol (TM). Below the text is a blue graphic element resembling a stylized 'F' or a series of overlapping rectangles.

We are experts in extracting insight from large sets of data

60,000

Terabytes of data stored

11.8m

Economic
time series

250,000

Company events

8.7m

Private
companies

42.6m

Estimates and KPIs
internationally

13.4m

Fixed income
securities

57,000

Public companies

92.5m

Company financial
data points per year

3.4m

Research documents
per year

980,000

Merger and
acquisition deals

8m

Financial price updates
per second

520,000

Equity quotes from
over 295 exchanges

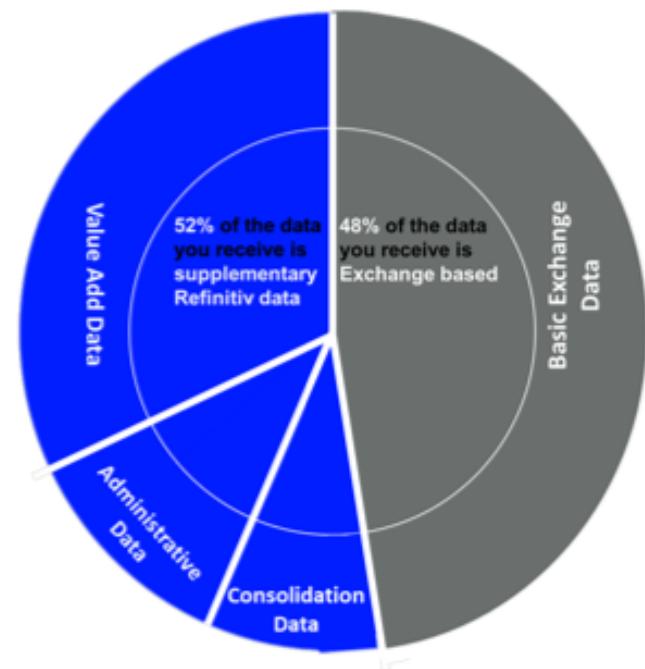
What do I receive with Refinitiv?

The **Refinitiv Difference** can be seen in all of the **additional** and unique data sets provided to our customers. For example, we provide:

Value Add
<ul style="list-style-type: none">Last bid/ask priceYear high/low indicatorsVWAP calculationsAuction priceOff-book trade informationCapital adjustment calculations

Administrative
<ul style="list-style-type: none">Product permissionsProduct currencyRIC informationIPO priceParent MIC codeCross-reference news data

Consolidation
<ul style="list-style-type: none">News retrieval codesEPS informationRatio of stock price to EPSAnnualized dividend informationCorporate Action information



Data Source: Euronext Equities

Any data company

can provide the generic data sets provided by the Exchanges

Exchange

- Last trade price
- Trade time and date
- Lot size
- ISIN code
- CFI code
- Orderbook trade volume
- Nominal share value
- Settlement price

Our content coverage is broad and differentiated



NEWS & COMMENTARY

- Commentaries
- Global and domestic news
- Newsletters
- BreakingViews
- Stocks and FX Buzz
- International Financial Reporting (IFR)
- Reuters polls
- Significant developments
- Videos
- News analytics
- Commodities research and forecasts
- Sentiment reports

RISK

- WorldCheck®
- Ultimate Beneficial Owner (UBO)
- Media Check
- Enhanced Due Diligence (EDD)

REFERENCE DATA

- Industry classifications
- Entity data (corporate structures)
- Corporate actions
- Security identifiers
- Terms and conditions

MARKET DATA & PRICING

- Equities
- Exchange-traded funds (ETFs)
- Commodities and energy
- Derivatives (futures, options and warranties)
- Fixed income (multi-asset coverage)
- Foreign Exchange (FX)
- FX and interest rate polls
- Loan pricing

INDICES & BENCHMARKS

- Global third party party and exchange offerings
- Cross asset indices and weighting
- Global benchmarks
- Global forecast aggregates
- Industry KPIs
- MarketPsych

COMPANY DATA

- Broker research
- Business classifications
- Credit (CDS)
- Company news
- Competitors
- Debt and syndicated loans
- Datastream
- Environmental, social and governance (ESG) data (ranking and ratings)
- I/B/E/S with registered trademark Estimates (detail and consensus)
- Filings
- Events and transcripts
- Fundamentals (standardised, as reported and point in time)
- M&A
- Officers and directors
- Ownership and bond holdings
- Private company data
- Research
- Shareholder activism intelligence
- Sanctions
- StarMine® scores
- Transactions
- Valuations

SUPPLY CHAIN DATA

- Suppliers
- Distributors
- Network of relationships
- Type, relevance and characteristics of relationships

MACROECONOMIC DATA

- Country data
- Key indicators
- Forecasts and polls
- Consumer confidence
- Industrial activity
- Economic fundamentals
- Point in time

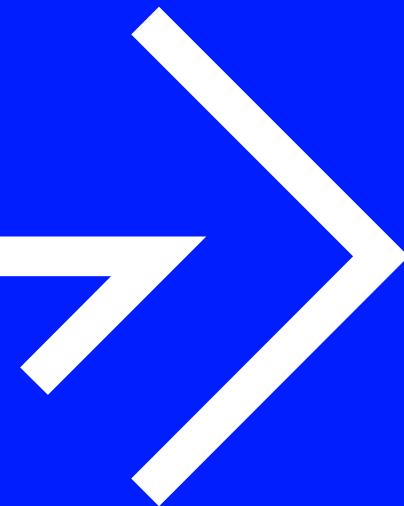
SPECIALIZED DATA

- Commodities fundamentals
- Deals and transactions intelligence
- Fund data (Lipper)
- Quantitative analytics and models (StarMine)
- Evaluated pricing service
- Private equity data

From Complexity to Simplicity

Refinitiv Data Platform

The Financial and
Risk business of
Thomson Reuters
is now Refinitiv.



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What is the job of this person?



Different types of Developer



Business Analyst



Quant Trader



Data Scientist

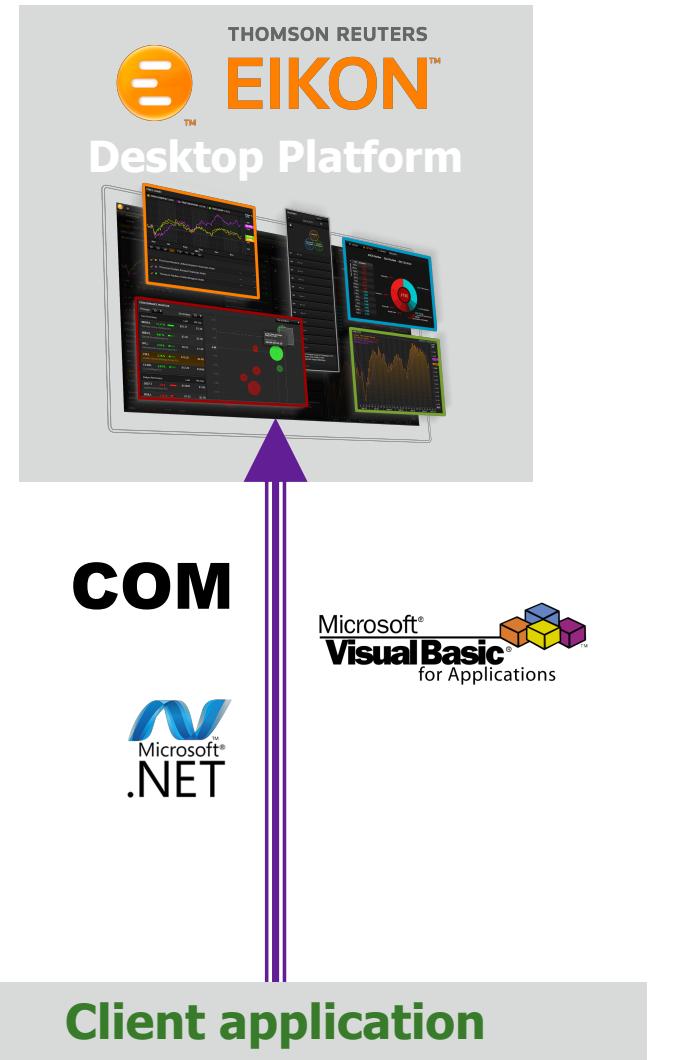
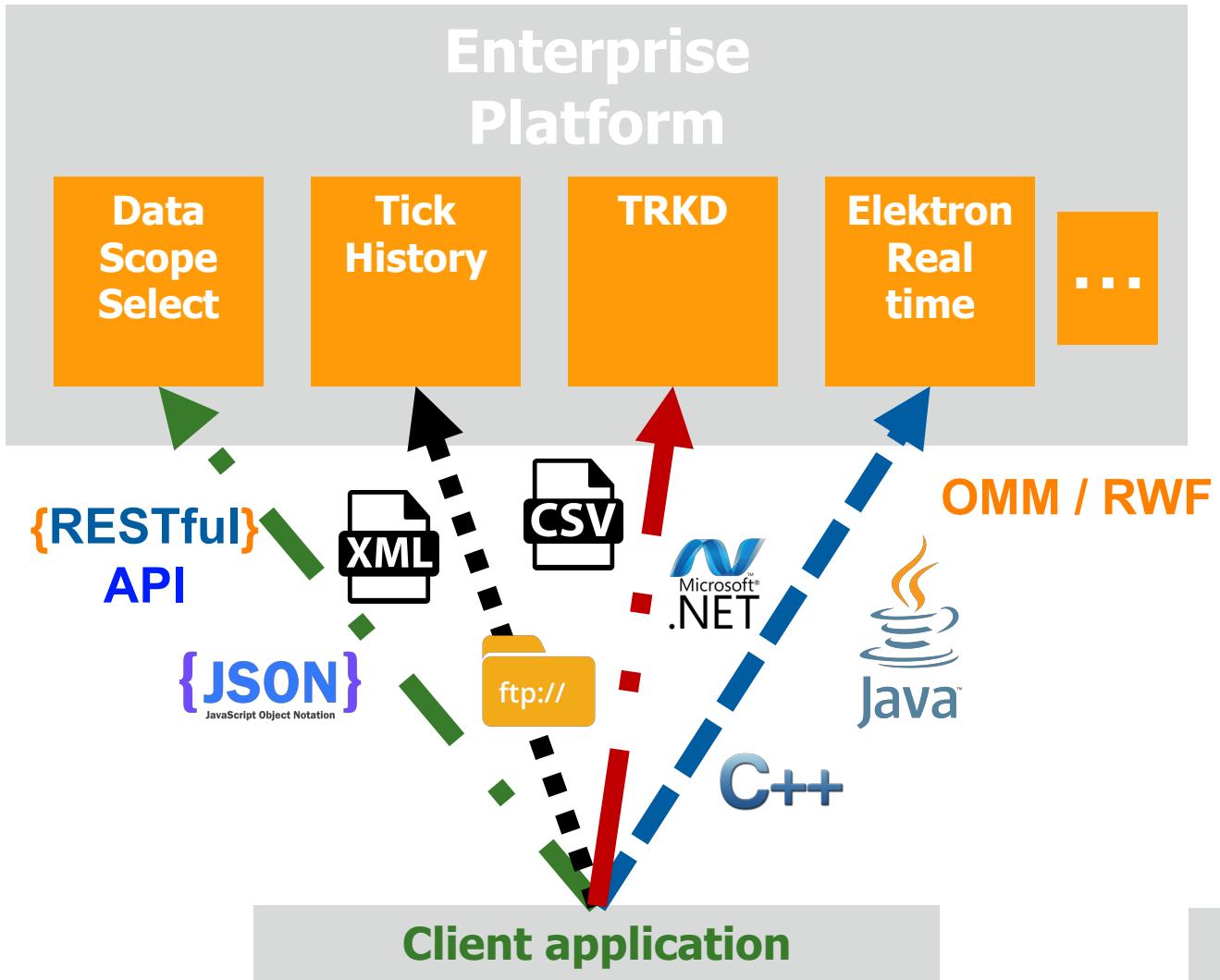


Bankers Who Code



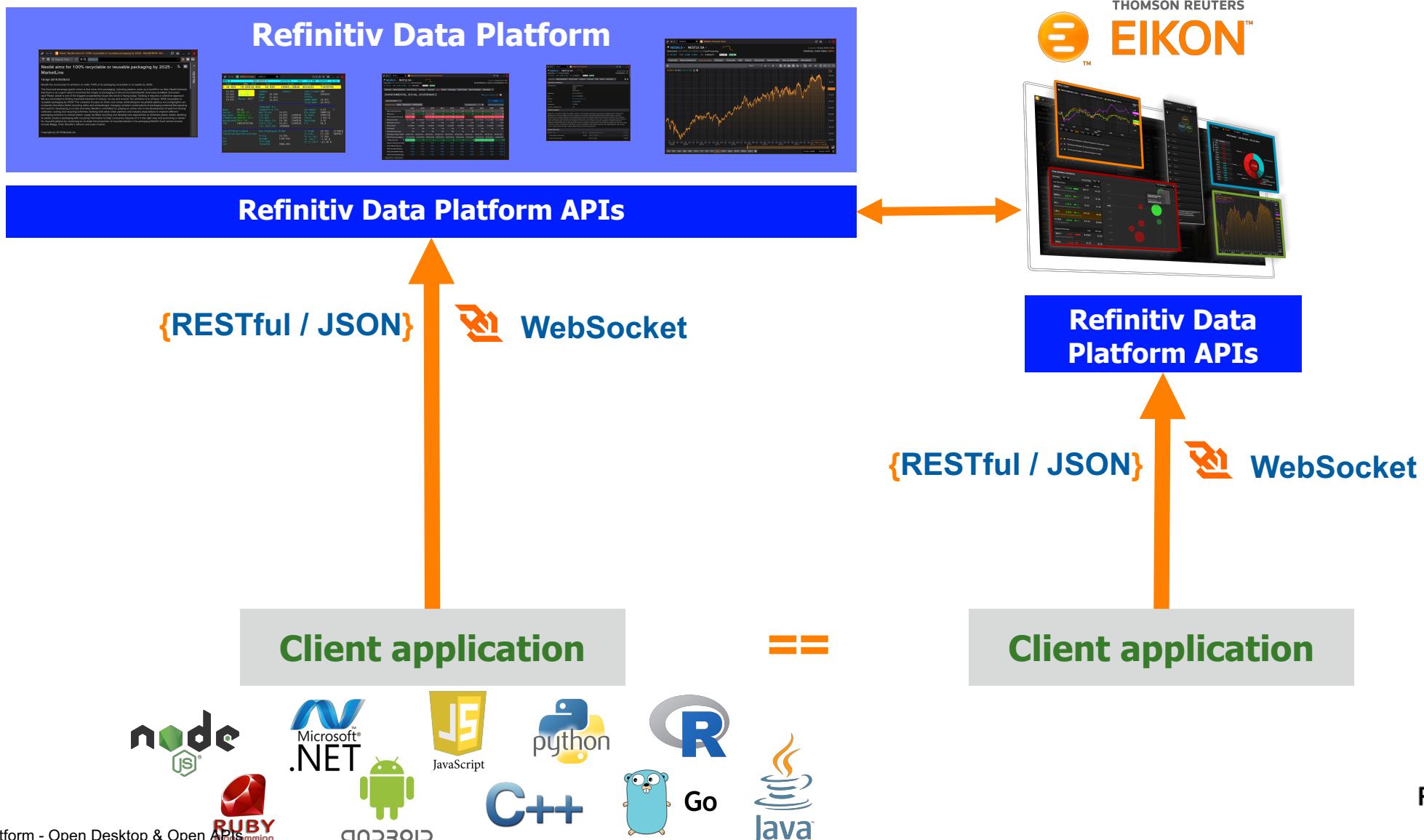
Computer Scientist

Refinitiv Products & their many APIs

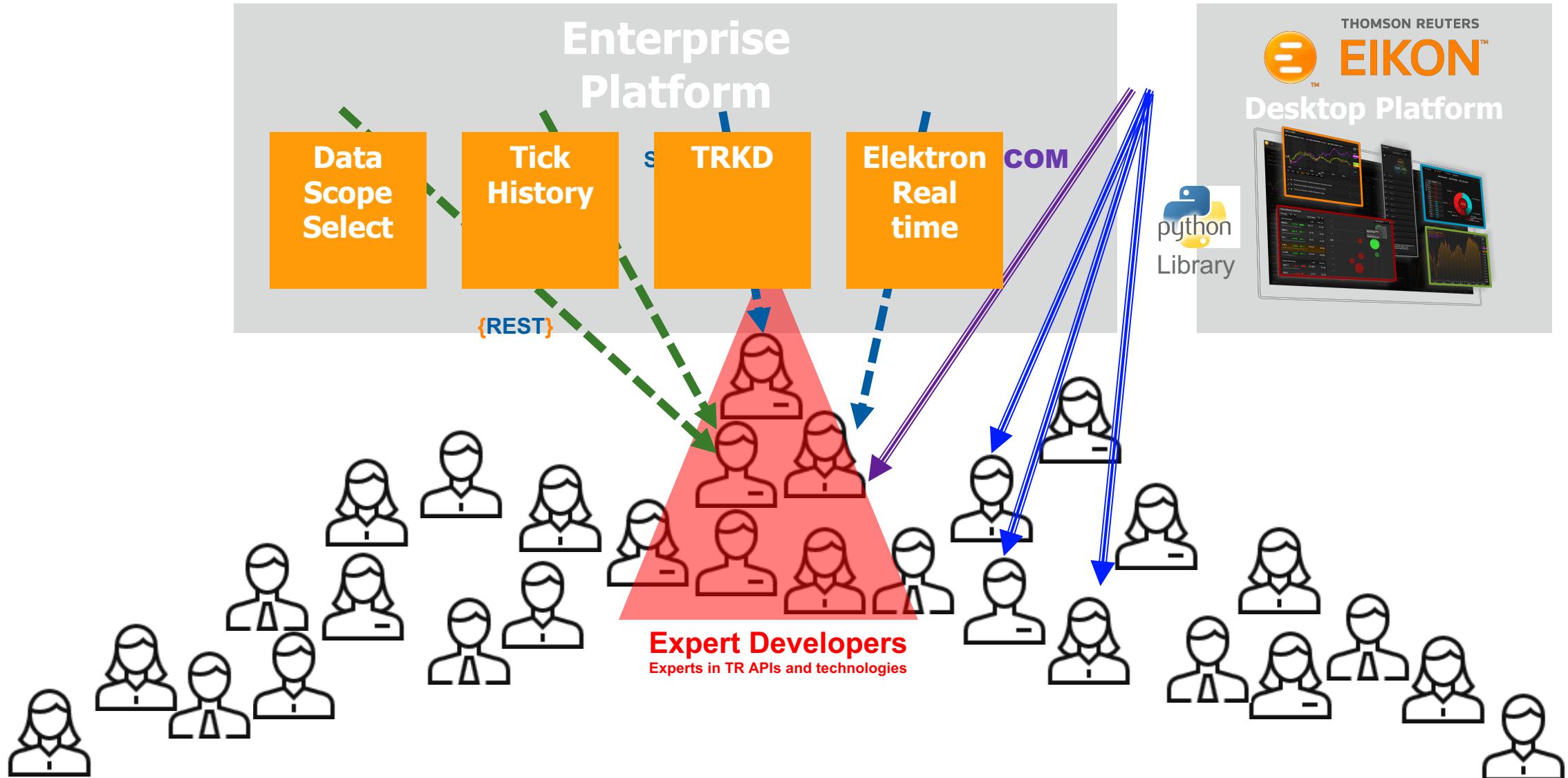


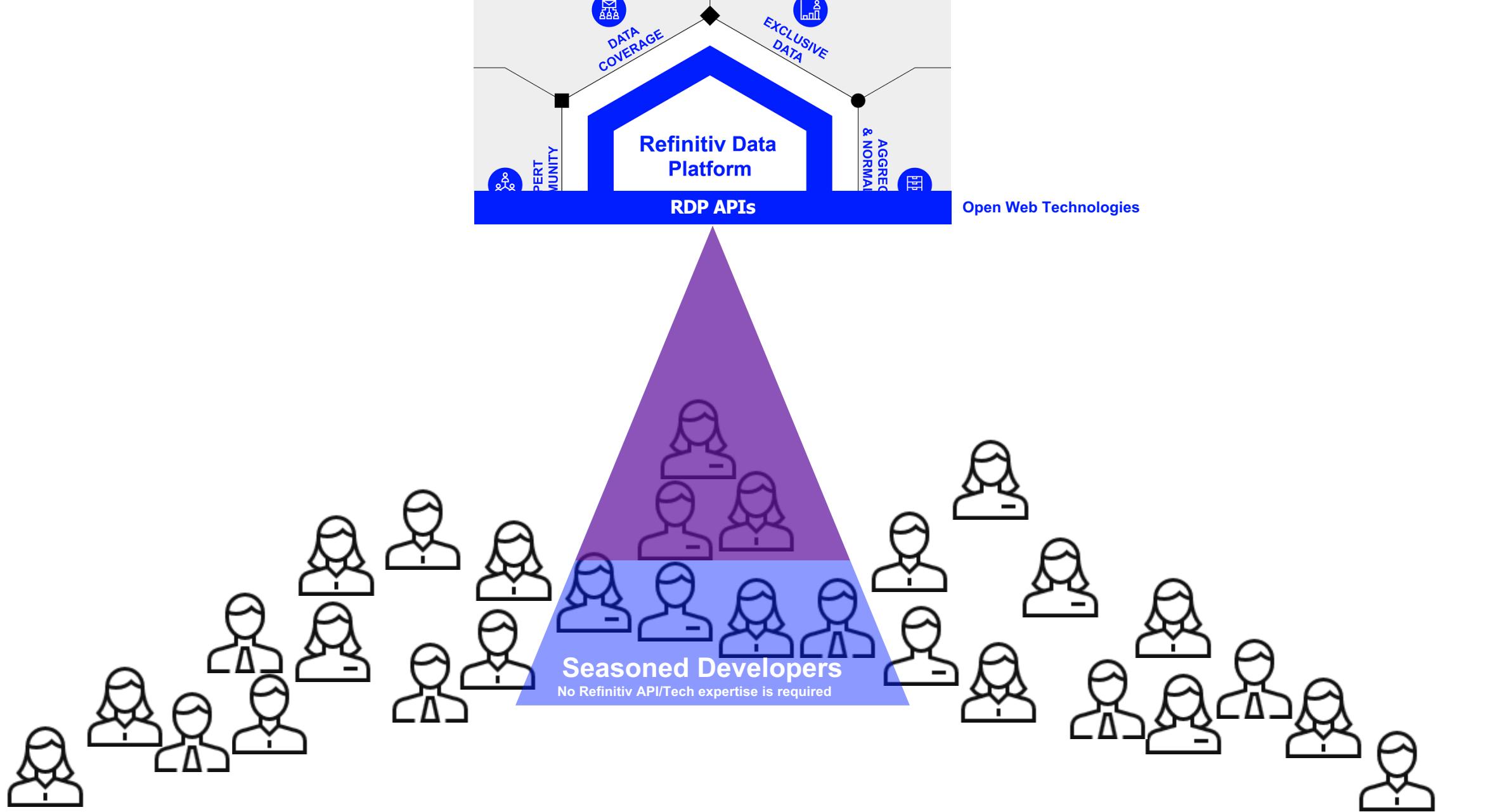
Refinitiv Data Platform

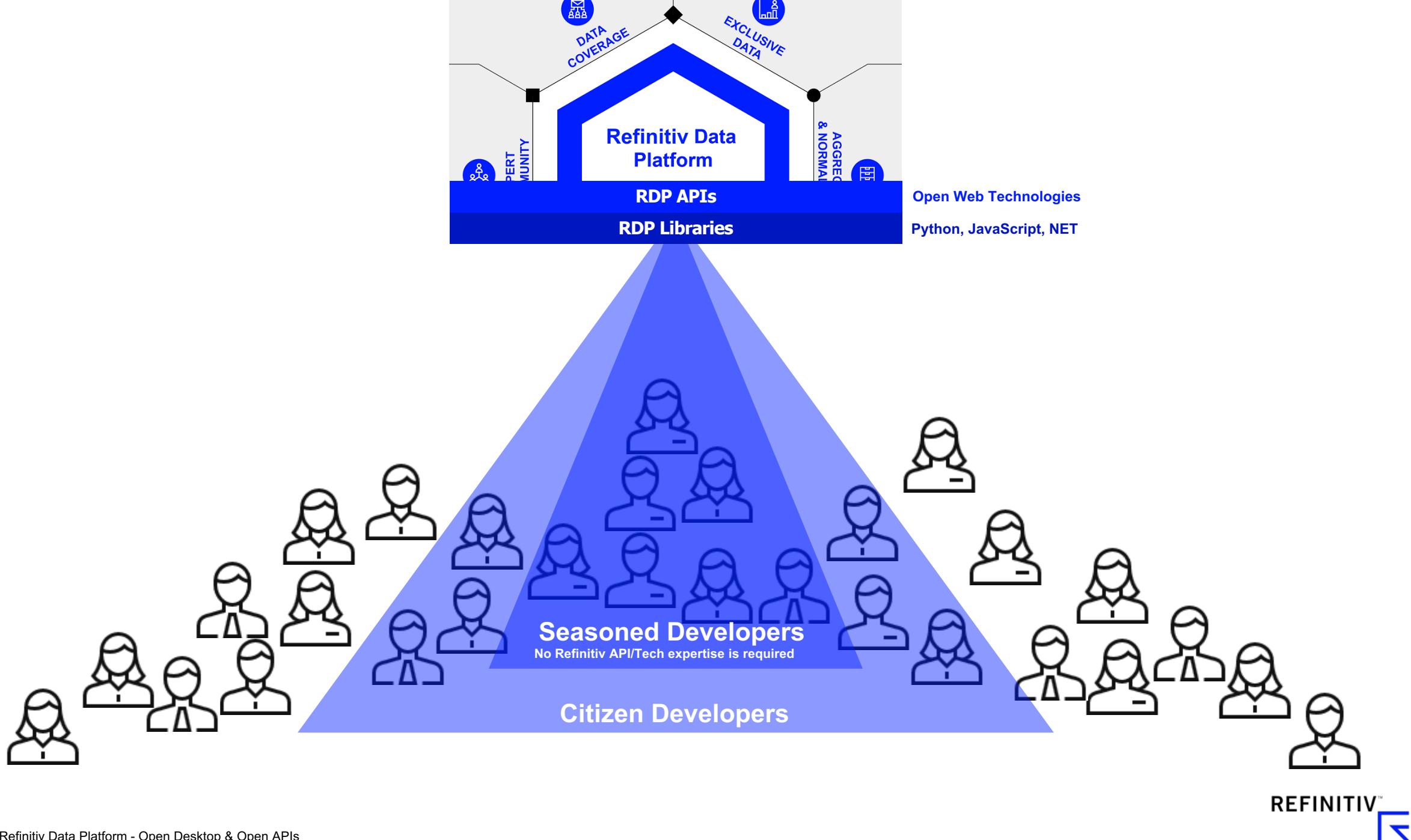
A single platform for all Refinitiv data

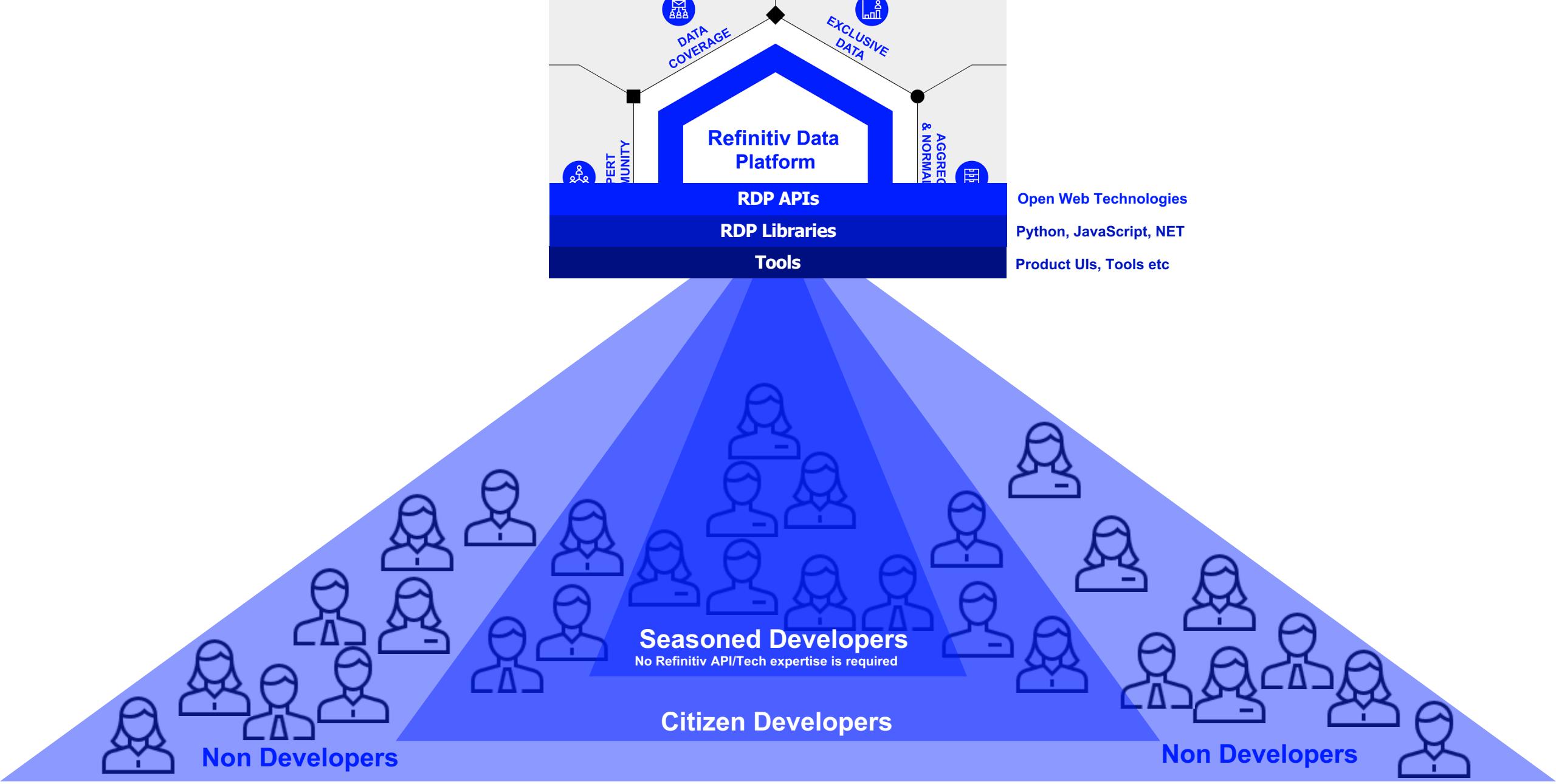


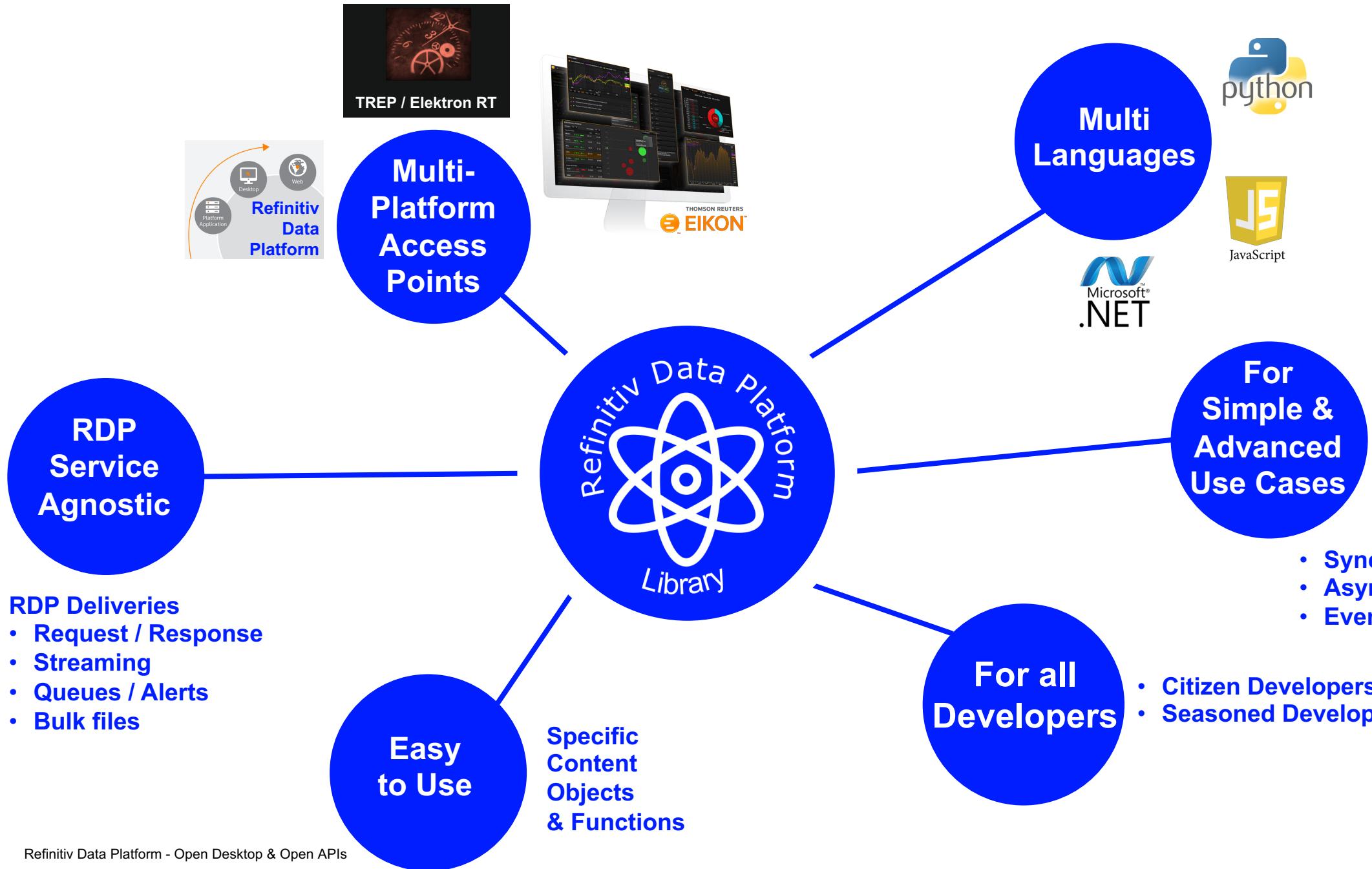
APIs for what developer audience?



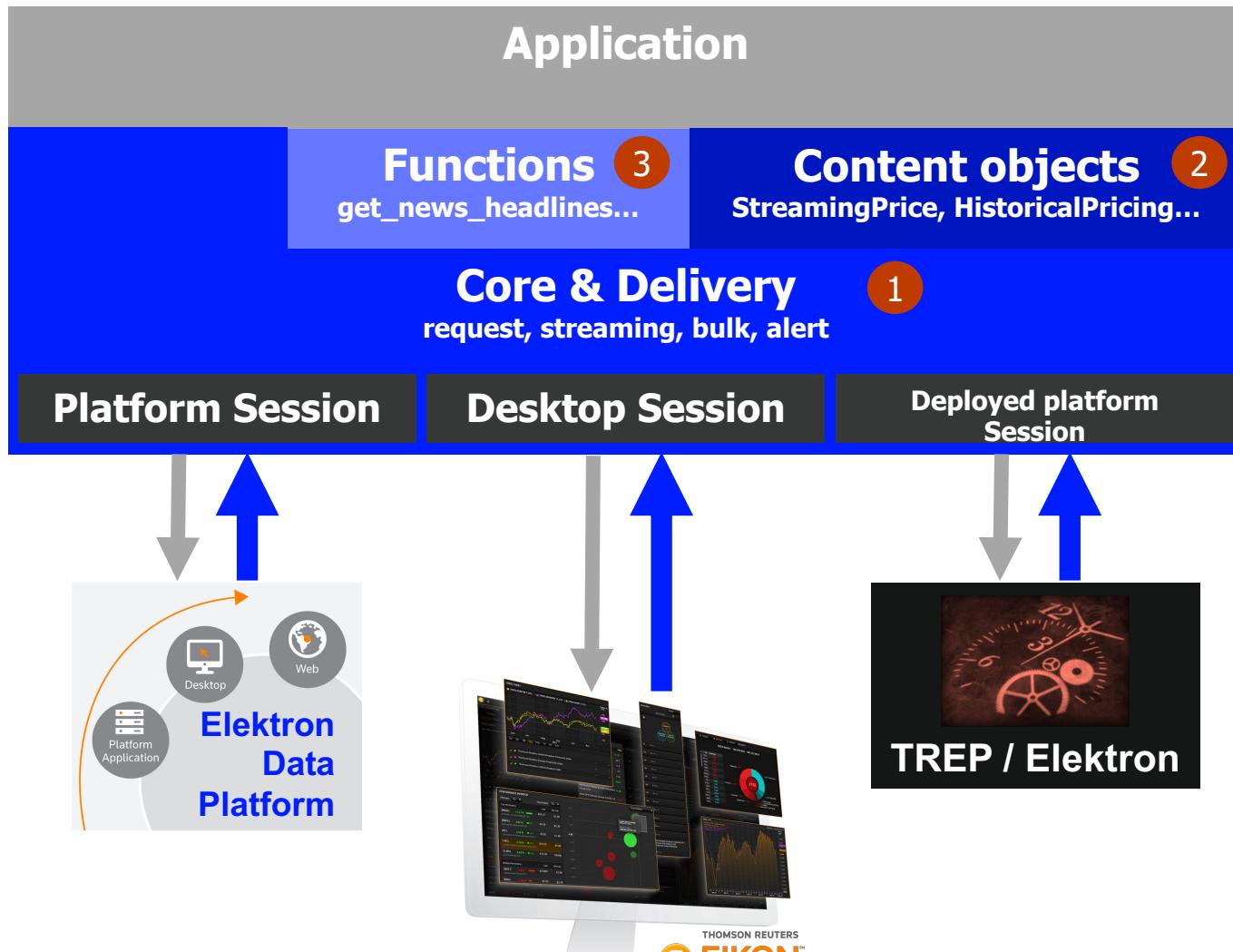








Refinitiv Data Platform Libraries – 3 Layers



Refinitiv Data Platform APIs –vs- Refinitiv Data Platform Libraries

Streaming Real-time data
retrieval with raw APIs

A dark-themed code editor window displaying a large, multi-line JSON or XML document. The code is highly nested, indicating a complex API request structure. The syntax highlighting shows various colors for different data types like strings, numbers, and booleans.

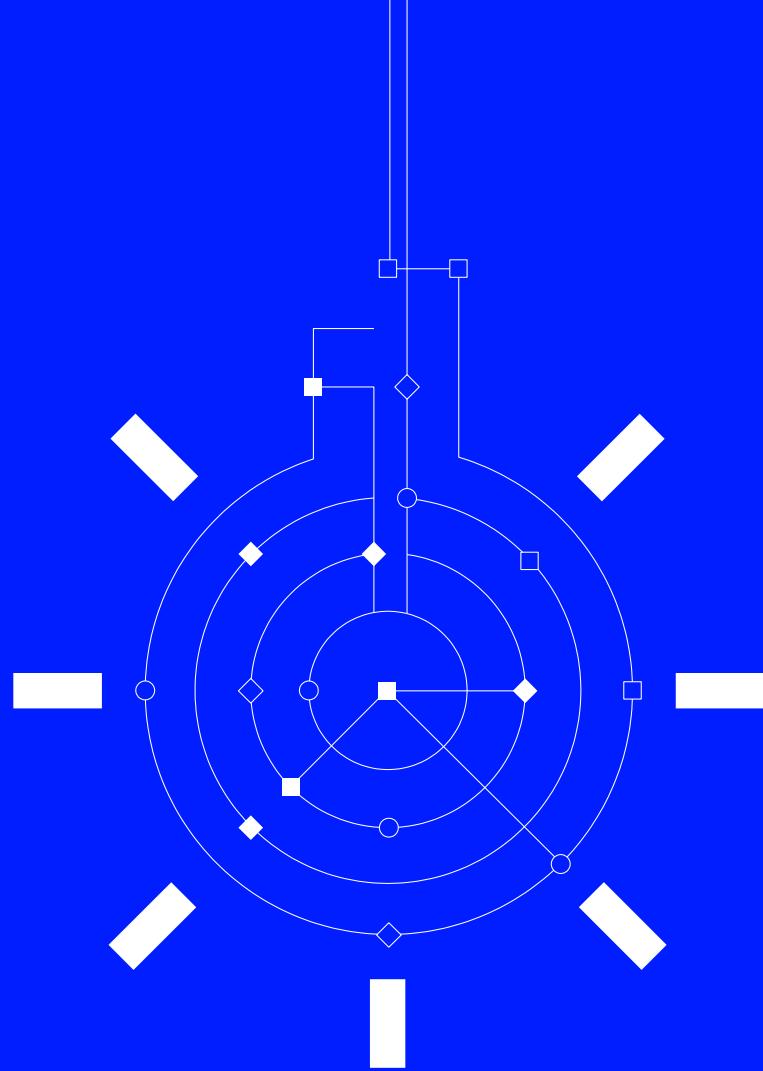
Streaming Real-time data
retrieval with Libraries

A dark-themed code editor window showing a significantly shorter and more readable piece of code compared to the raw API version. This code likely represents the same functionality as the API above but utilizing a library's built-in functions and classes to handle the data retrieval process.

Refinitiv Data Platform Libraries

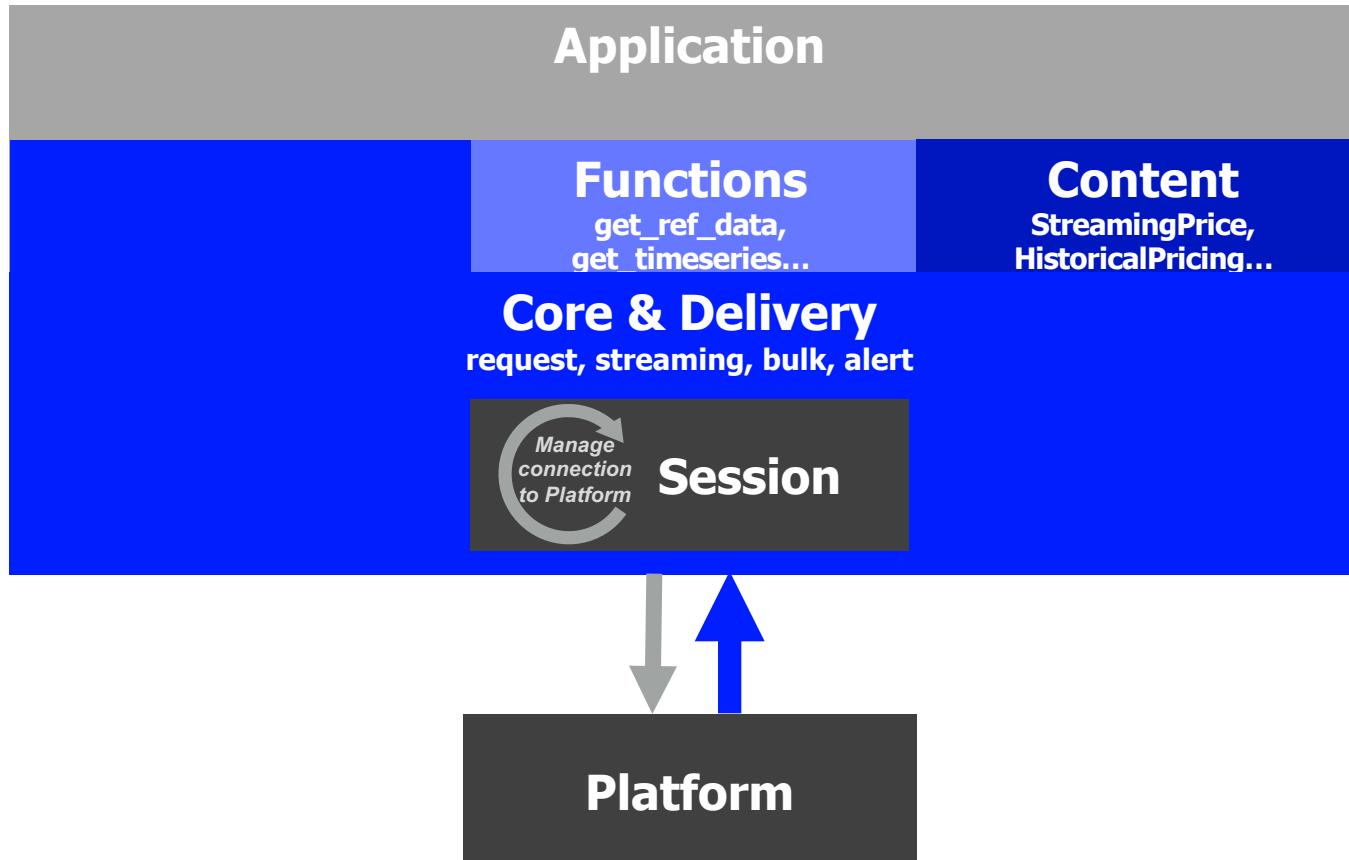
Umer Nalla

API Consultant / Developer Advocate



Three abstraction Layers

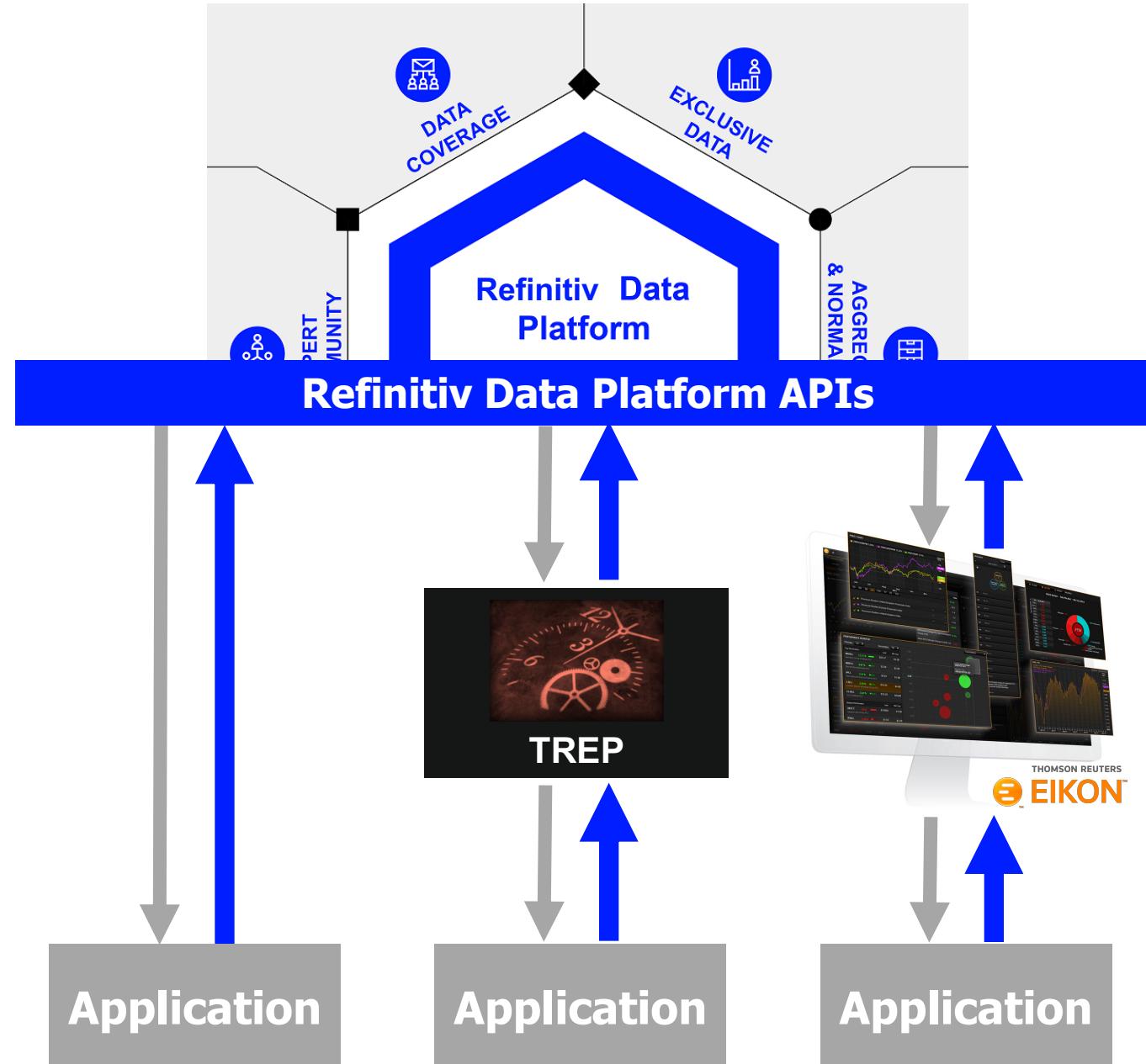
For all types of developers



Three Access Points & Sessions

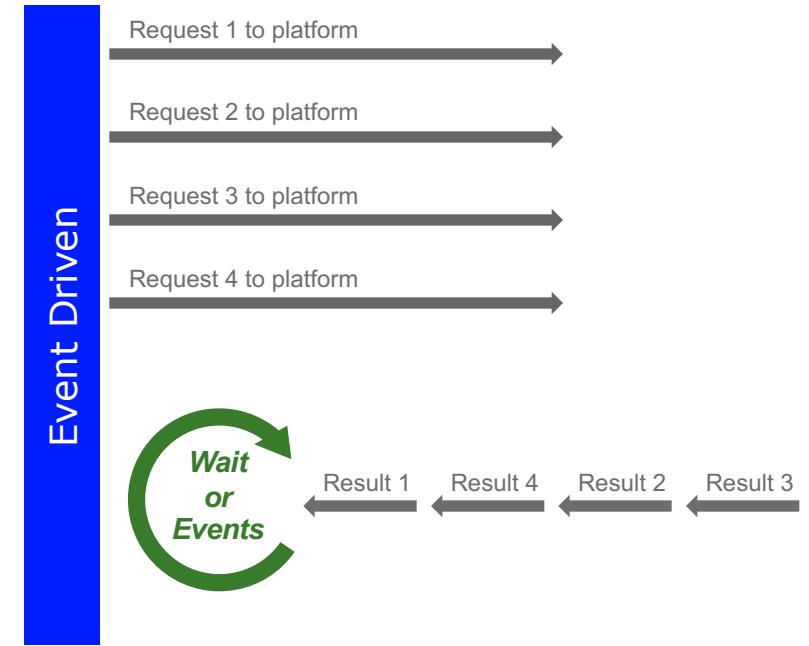
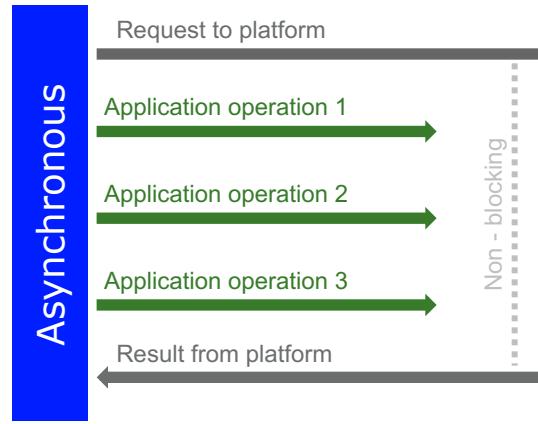
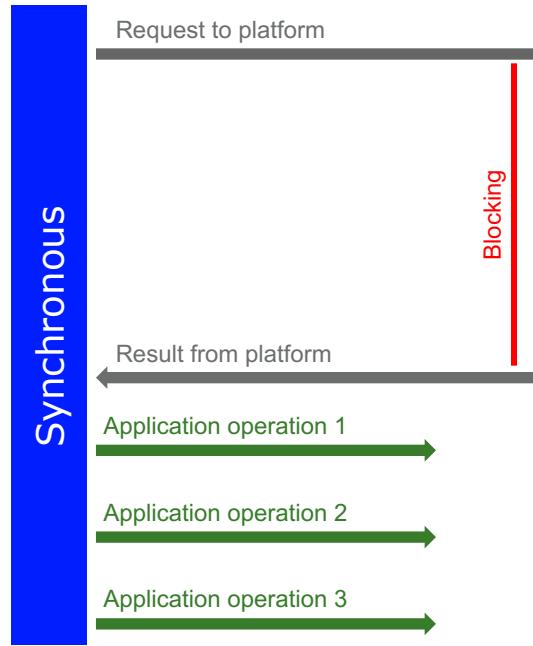
Accessible via different access points

Multiple sessions in single application



Three Operating modes & Multi-language

To fulfill the vast majority of use cases



- **Refinitiv owned editions**

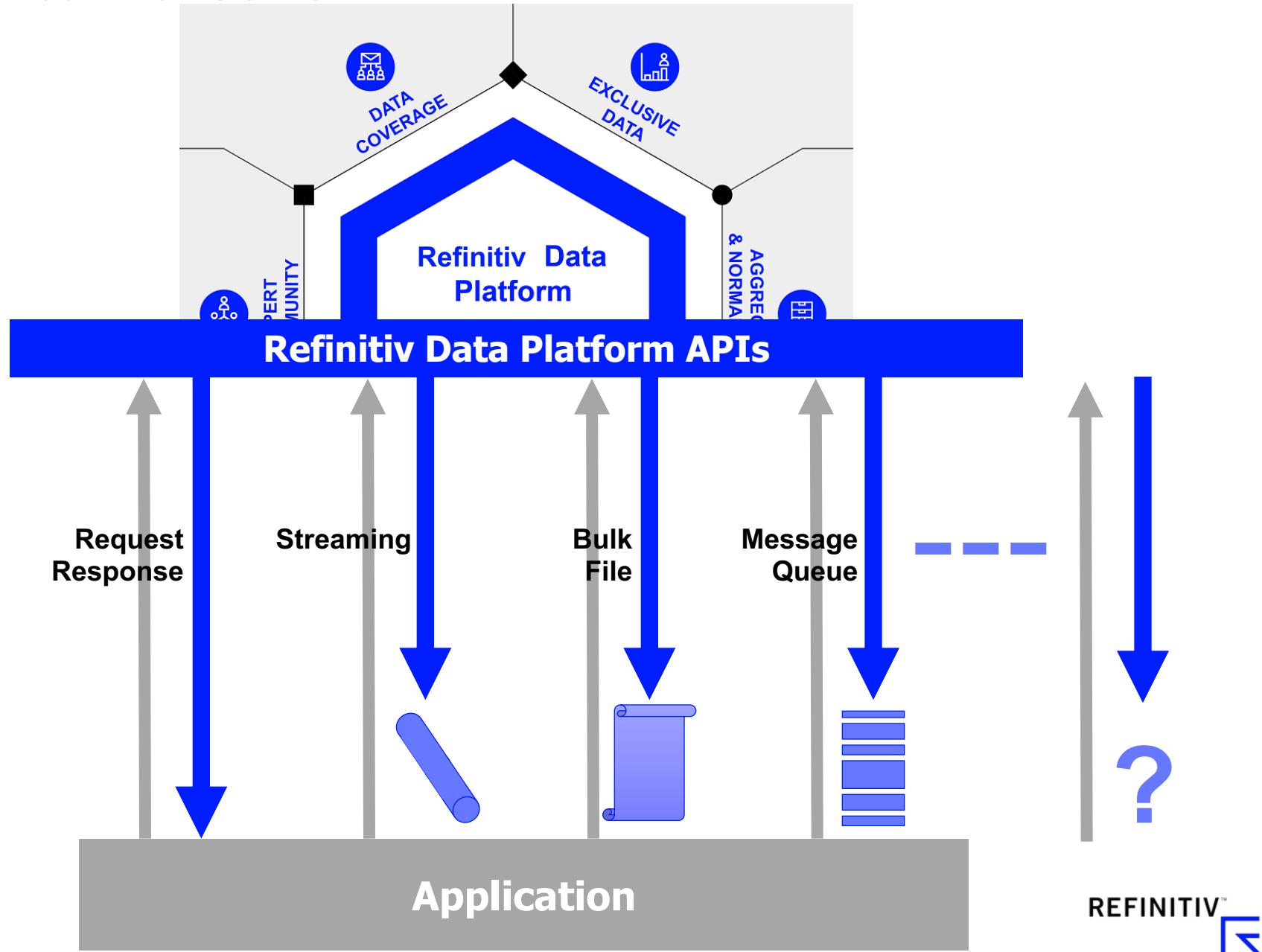


- **Community owned editions**



Four delivery modes for a wealth of Content

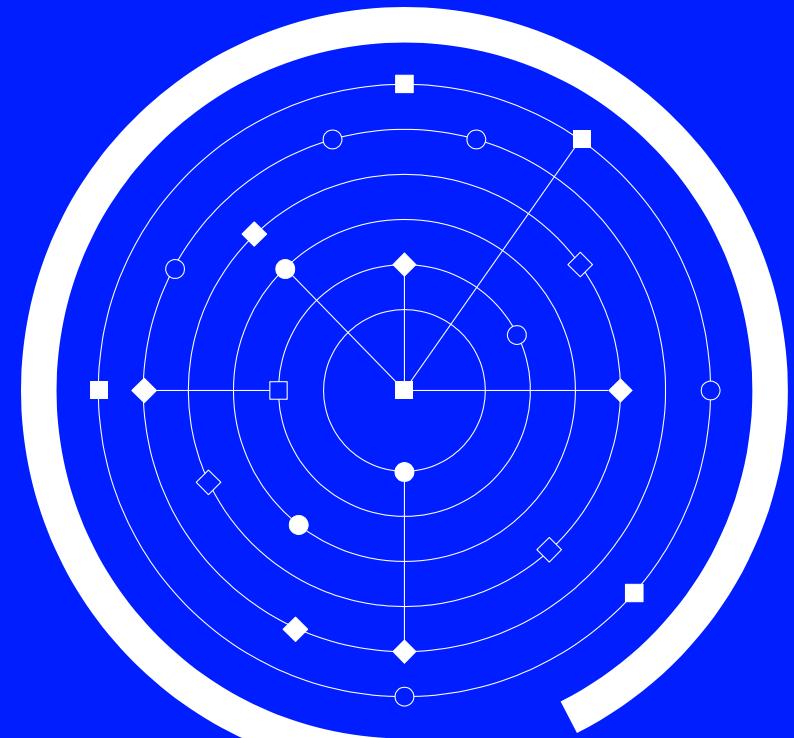
- Request / Response
- Streaming
- Bulk File
- Message Queue



Python demo

And some .NET examples too!

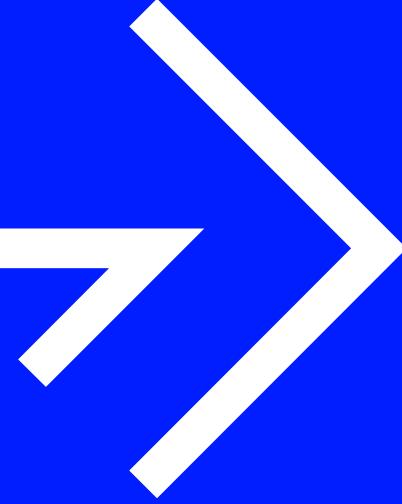
Refinitiv Data Platform Libraries



REFINITIV™ 

Simplifying the Dev Workflow

Eikon & Refinitiv Workspace, Tools for Developers



The Financial and
Risk business of
Thomson Reuters
is now Refinitiv.

REFINITIV™
The Refinitiv logo consists of the word "REFINITIV" in a bold, sans-serif font with a registered trademark symbol, followed by a stylized "R" icon made of three slanted bars.

REFINITIV WORKSPACE FOR INVESTMENT BANKERS

The Financial and
Risk business of
Thomson Reuters
is now Refinitiv.

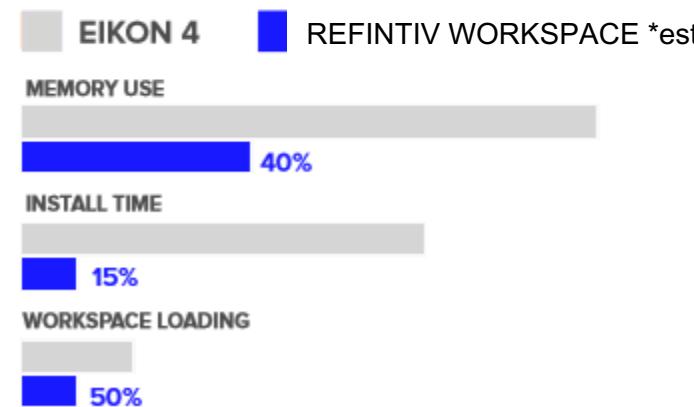


TECHNOLOGY & PERFORMANCE

A lighter framework, based on web-based, market leading technologies, runs faster and provides more modular access to capabilities across platforms.



Lightweight installation reduces desktop footprint, memory use and improves performance.



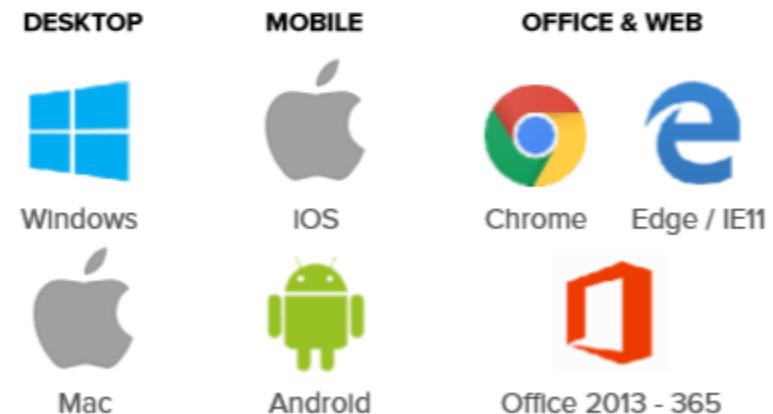
Financial operating system reimaged for the web using open source technology and standards.



All applications rebuilt in HTML5



Cross platform support runs on any device on desktop, mobile, web.



INTELLIGENT SEARCH

More relevant and powerful

Improved relevancy & performance

Visual feedback provides instant access to content in the search window

Access to people and content from auto-suggest

Smarter search for power users

Command line search allows navigation to specific content and analytics in seconds



OPEN DESKTOP

Platform for financial workflow

For application developers

Updated Eikon SDK for rapidly building content rich applications

Enable workflow and interoperability across any desktop application

For data scientists

Full access to Refinitiv content through the Eikon Data API

Instant access to Python Jupyter Notebooks from within Eikon desktop for any user



Eikon - A Tool for Developers

The screenshot shows the Thomson Reuters Eikon Request Builder application window. On the left, there's a sidebar with categories like 'DATA ITEMS', 'Issuer Level Credit Rating (30)', 'Price & Volume (342)' (which is expanded to show 'Price & Volume History (24)'), 'Price Performance (185)', 'Volume Measures (36)', 'Regression & Volatility (56)', 'Technical Indicators (37)', 'Short Interest (4)', 'Reuters Fundamentals (1148)', 'Period End Ratios (1097)', and 'Time Series Ratios (32)'. Below this is a 'Selected Items' list containing several items, with 'TR.PriceClose' highlighted. At the bottom, there's a code editor window showing Python code for generating a request:

```
data = ekf.get_data(  
    DataParams()  
        .instruments("IBM.N")  
        .fields(  
            "TR.PriceClose",  
            "TR.Price52WeekHigh",  
            "TR.PricePctChg52WkHigh",  
            "TR.Price52WeekLow",  
            "TR.PricePctChg52WkLow",  
            "TR.PriceTargetMedian"  
        )  
    )  
  
print(data)
```

Below the code editor are buttons for 'OUTPUT' (selected), 'Excel Formula', 'Python', 'Java', 'JavaScript', and 'TypeScript'. To the right of the code editor is a large panel for configuring fields, showing 'Price Close' selected. This panel includes sections for 'Parameters' (As of: 1D, Scale: 0, Currency: Default, Lag: blank, Output: value) and 'Quick Functions' (Treat As Zero If Not Available, Absolute Value, Change: % Over 1 D). A 'Show Less' button is also present.

Annotations with blue boxes and arrows point to specific features:

- A box labeled 'Multiple language support' points to the 'OUTPUT' tab and the code editor area.
- A box labeled 'Code Autogeneration' points to the code editor window.
- A box labeled 'Full Description of fields and parameters' points to the configuration panel on the right.
- A box labeled 'Open in a secure server-side Jupyter Notebook (Demo Later)' points to the 'Open In Jupyter App' button at the bottom right of the interface.

Eikon - A Tool for Developers

The screenshot shows a Jupyter Notebook interface. On the left is a file browser with several files listed. In the center is a code cell [2] containing Python code:

```
[1]: import numpy as np
import pandas as pd
import eikon as ek
ek.set_app_key('my_token_here')

def ric_to_isin(ric):
    return ek.get_symbology(ric, from_symbol_type='ric', to_symbol_type='isin')

[2]: num_steps = 500
df, err = ek.get_data('DE5Y|')
```

A dropdown menu is open over the code in line [2], showing a list of instrument suggestions for 'DE5Y'. The suggestions include various benchmarks and a warrant, each with a code snippet and a unique identifier.

Type	Name	Code Snippet	Identifier
BMK	Germany 5 Year Benchmark	DE 5Y BUND BOBL - THOMSON REUTERS	DE5YT=RR
BMK	Germany 5 Year Benchmark	DE 5Y TWEB BMK - TRADEWEB	DE5YT=TWEB
BMK	Germany BTEC 5 Year Benchmark	DE BTEC 5Y BMK - BROKERTEC	DE5YT=BTEC
BMK	Germany 5 Year Benchmark	DE 5Y TRPS BMK - THOMSON REUTERS EVALUATED	DE5YT=RRPS
BMK	Germany 5 Year Benchmark	DE5Y SMKR BMK - TULLETT PREBON	DE5YT=SMKR
BMK	Germany 5 Year Benchmark	DE 5Y TMKR BMK - TULLETT PREBON	DE5YT=TMKR
BMK	Germany Delayed Benchmark 5 Year Point	DE 5Y XX BMK - THOMSON REUTERS DELAYED	DE5YT=XX
BMK	Germany 5 Year Benchmark	DE 5Y CKLU BMK - CARL KLIEM SA	DE5YT=CKLU
BMK	Germany Close Fix Benchmark 5 Year Point	DE CF 5Y - THOMSON REUTERS CLOSE SNAP	DE5YT=CF
BMK	Germany Fix 1 Benchmark 5 Year Point	DE 1F 5Y - THOMSON REUTERS INTRADAY SNAP 1	DE5YT=1F
WAR	Deutsche Bank AG Put 3080 EUR Dow Jones EURO STO...	DEDE5YWN=DBBL	

At the bottom of the suggestion list, there is a link 'More search results for "DE5Y"' and a keybinding 'Shift+Enter'.

Inline instrument
autosuggest in Jupyter App

Eikon - A Tool for Developers

The screenshot shows a Jupyter Notebook interface. On the left, a file browser lists various files and folders. In the center, a code cell contains Python code. A dropdown autosuggestion menu is open over the line `df, err = ek.get_data('DE5YT=TWEB', ['next cou|'])`, showing several options related to financial data. A blue arrow points from the text "Inline data item autosuggest in Jupyter App" to this menu.

```
[1]: import numpy as np
import pandas as pd
import eikon as ek
ek.set_app_key('my_token_here')

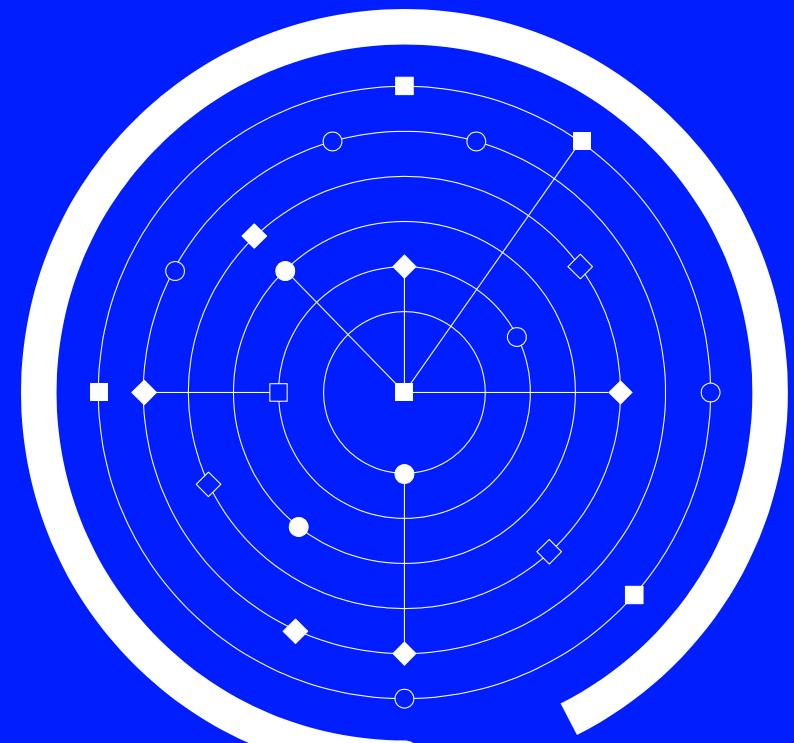
def ric_to_isin(ric):
    return ek.get_symbol(ric, from_symbol_type='ric', to_symbol_type='isin')

[2]: num_steps = 500
df, err = ek.get_data('DE5YT=TWEB', ['next cou|'])
```

FLD Next Coupon Duration
Next coupon duration.
FLD NEXT COUPON DUR
NXT_CPNDR
FLD Next Coupon Date
Next Coupon Date.
FLD Next Multi-Coupon Change Date
Date of `next` scheduled change in `cou`pon rate.
FLD Next Multi-Coupon Change Rate
New `cou`pon rate effective on the `next` scheduled change date.
More Signal ...
More search results for "next cou"
Shift+Enter

Inline data item
autosuggest in
Jupyter App

Python demo



THANK YOU

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