

# Grow your business with Predictive Analytics



Herve Kauffmann  
GTM Predictive Analytics

# What is BusinessObjects Predictive analytics



# SOLVE REAL BUSINESS PROBLEMS

By Optimizing Resources and Improving Margins

## SALES & MARKETING



- Churn Reduction
- Customer Acquisition
- Lead Scoring
- Product Recommendation
- Campaign Optimization
- Customer Segmentation
- Next Best Offer/Action

## OPERATIONS



- Predictive Maintenance
- Load Forecasting
- Inventory/Demand Optimization
- Price Optimization
- Manufacturing Process Opt.
- Quality Management
- Yield Management

## FRAUD AND RISK



- Fraud and Abuse Detection
- Claim Analysis
- Collection and Delinquency
- Credit Scoring
- Operational Risk Modeling
- Crime Threat
- Revenue and Loss Analysis

## FINANCE AND HR



- Cash Flow and Forecasting
- Budgeting Simulation
- Profitability and Margin Analysis
- Financial Risk Modeling
- Employee Retention Modeling
- Succession Planning

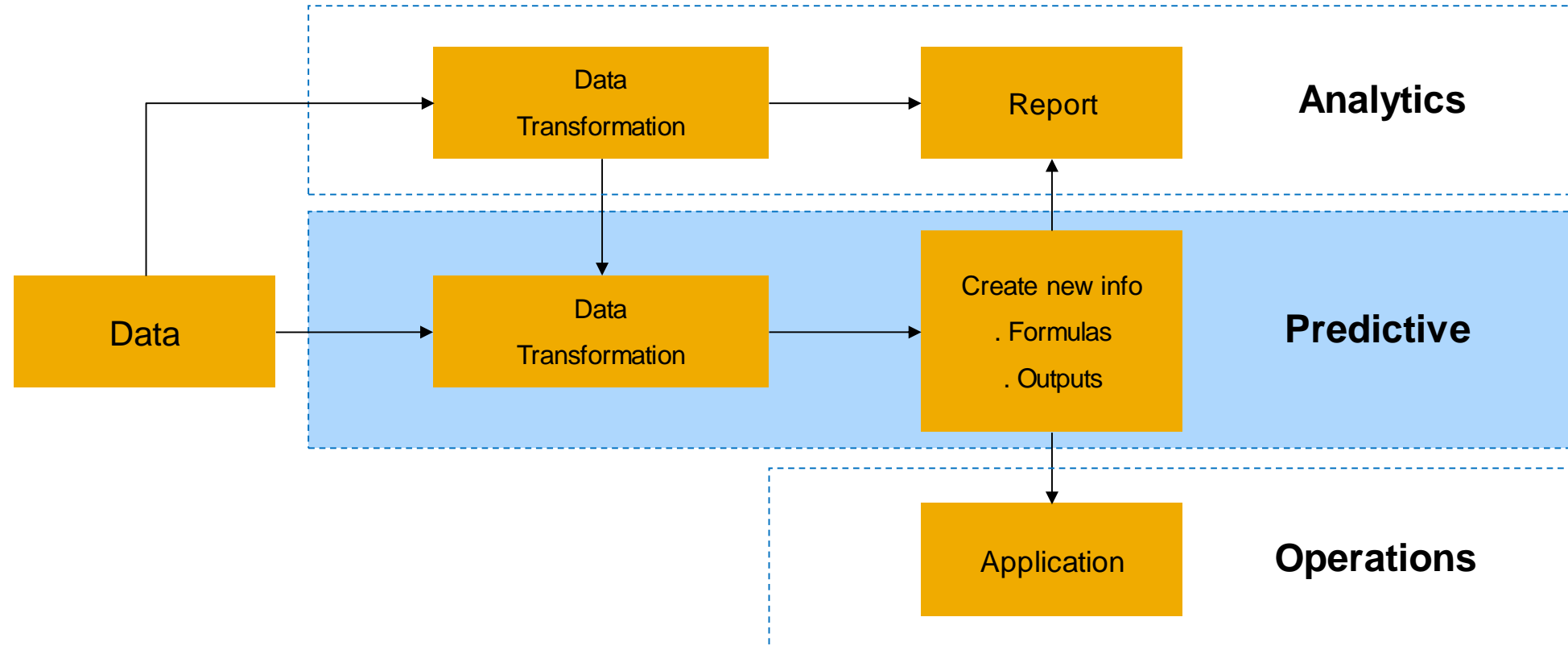
## OTHER SECTORS



- Life Sciences
- Health Care
- Media
- High Education
- Public Sector / Social Sciences
- Construction and Mining
- Travel and Hospitality
- Big Data and IoT

# Data Drive Predictive Analytics

*By 2018, 75% of enterprise and ISV development will include cognitive/AI or machine learning functionality in at least one application, including all business analytics tools (IDC Dec 2016).*





# SAP BusinessObjects Predictive Analytics portfolio

A standalone ready to use solution

## **SAP BusinessObjects Predictive Analytics 3.1:** Ready for sell on premise solution

- On Premise Machine learning Solution
- Enable users to build, execute, and manage their own predictive models in various environments

## **SAP Cloud Platform predictive services:** Ready for sell cloud solution

- Collection of ready to use RESTful web services
- Dedicated to Java developers
- Deliver cloud based applications providing predictive outputs

## **BOC for Predictive:** Ready for sell predictive extension for BOC

- Set of ready to use guided machine learning and discovery features
- Help all users to run what-if analysis, forecasts, and predictive scoring in BOC for BI

# Strengths & Weaknesses of SAP Predictive Analytics for OEM

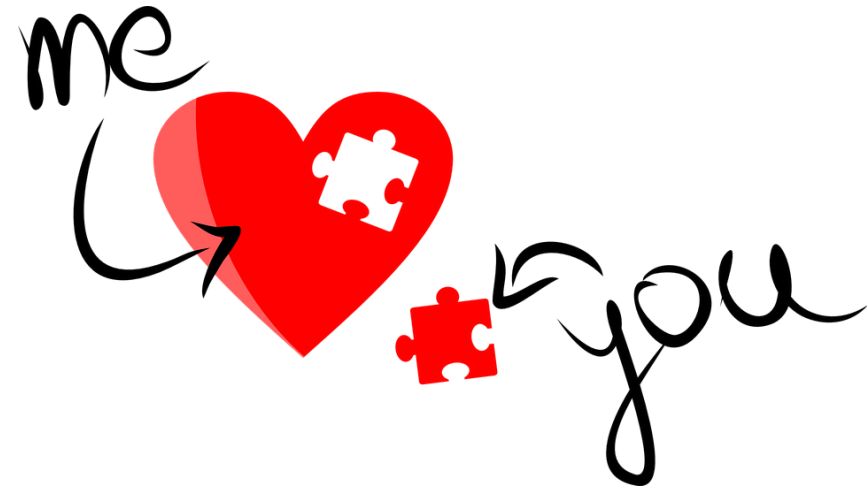
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## Strengths (what we do customers love)

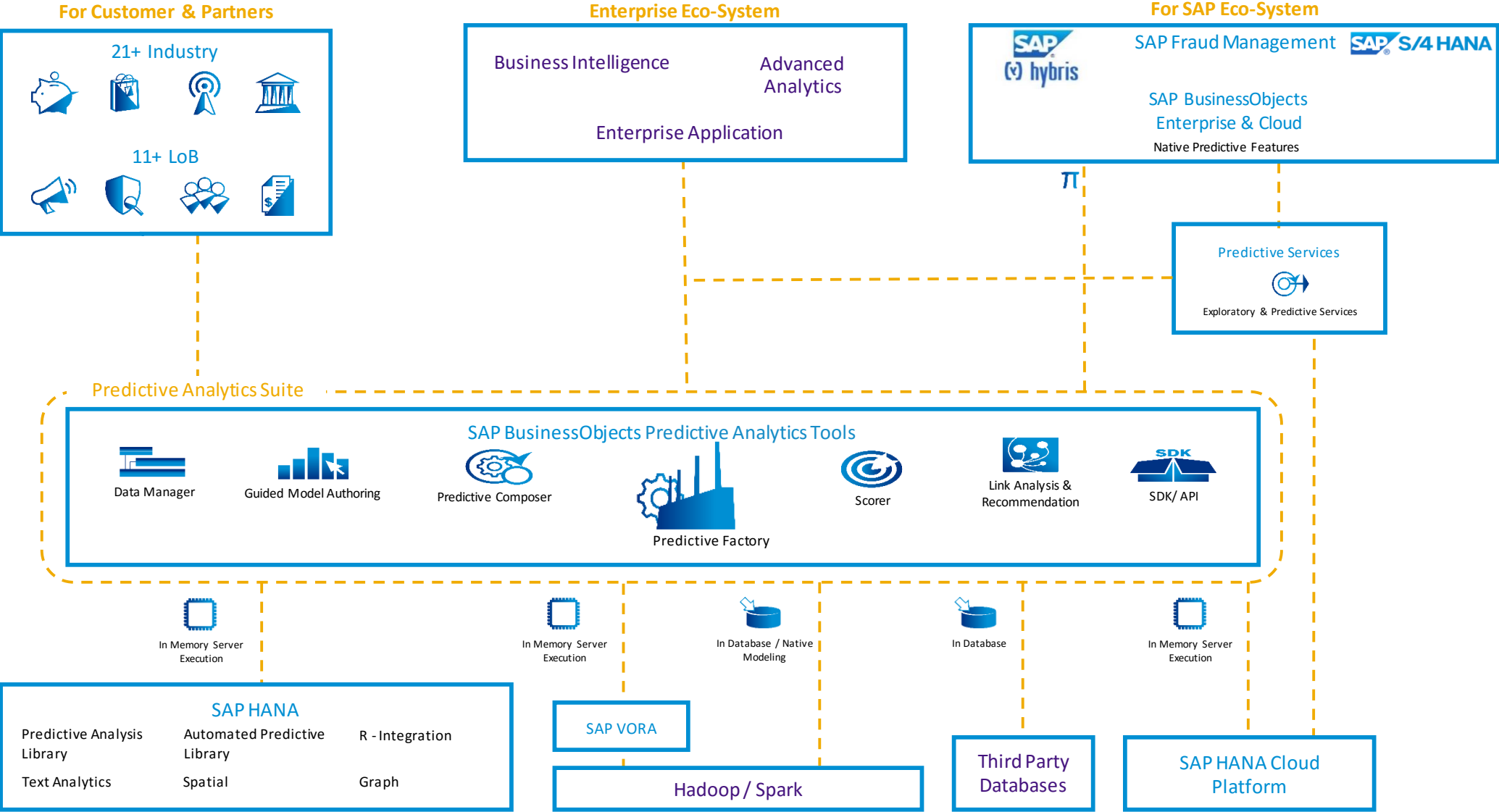
- Quick, Easy, and Safe to embed
- Automation
- Scalability (Very High number of columns)
- Shorten time to market
- OEM partner do not need expert level in data science
- End customer do not need data scientists to maintain applications

## Weaknesses (what we don't do customers need)

- Only Automated can be Embedded
- Enablement & support
  - Limited Sales and pre-sales knowledge
  - Dedicated training course for OEM
  - Support during prototyping and integration



# PREDICTIVE ANALYTICS ECOSYSTEM OVERVIEW



# WHAT'S NEW IN PREDICTIVE ANALYTICS

## Overview

### The current version is Predictive Analytics Suite V3.1

- First Hadoop/Spark release
- Better HANA integration
- Support BW/4HANA
- Support HANA Vora
- Support of HANA Smart Data Streaming

### Primary focus for 2017 sales

### Next version will be Predictive analytics V3.2

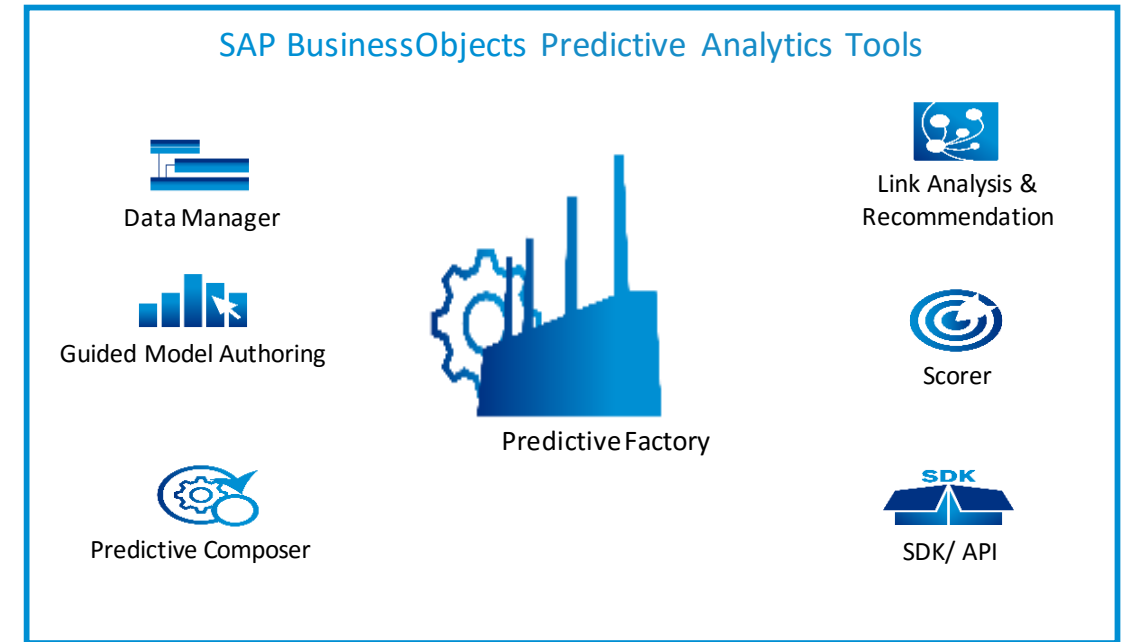
- Still On Premise version
- Important milestone on the PA Cloud Edition path
- Offers new important functionalities to HANA users

### Scheduled June 2017

### Future versions will be developed on the Cloud first then ported On Premise

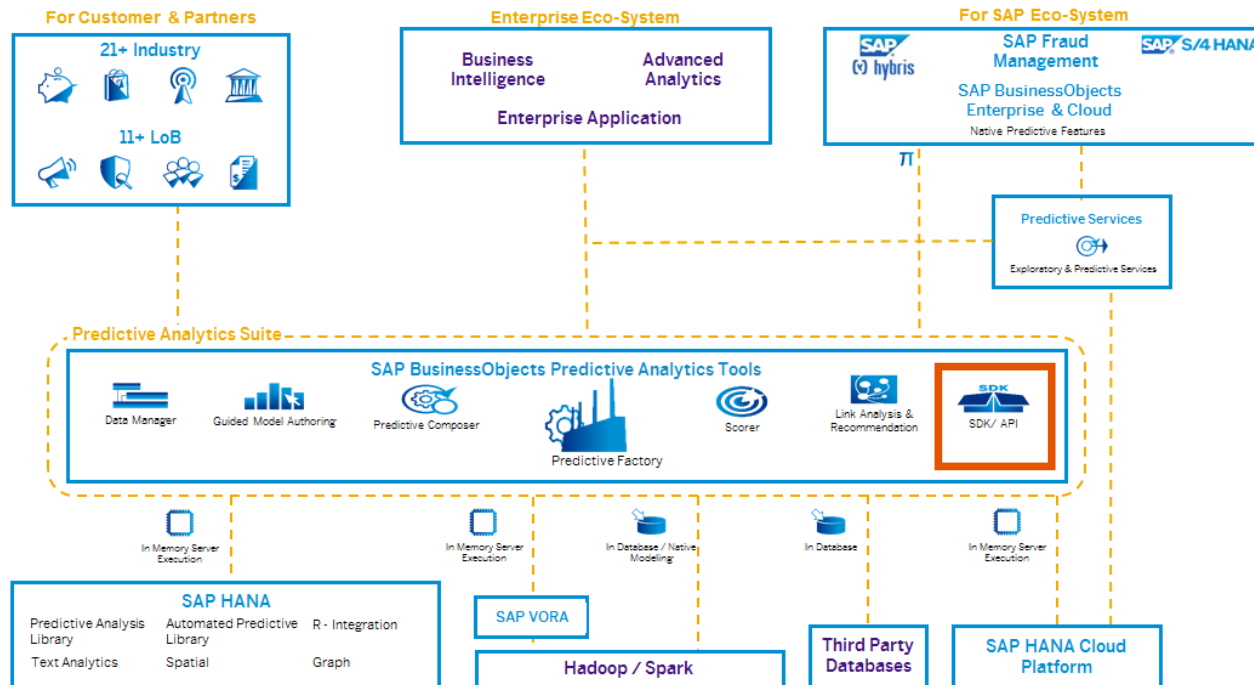
- Under the SBOC umbrella

### Scheduled Q1 2018





# Empower applications using API / SDK for Automated



## SDK for automated models:

### KxScript


- is a custom scripting language that lets you define all aspects of model creation, model training & model apply
- By default, the script is generated through the PA Desktop UI. Manual edits possible though
- Many features not yet available in the product can often easily be achieved via KxScript

### Other APIs

- Models on PA automated server can be controlled via these APIs: Java using JNI (local) or CORBA (remote), C++, COM/DCOM, JDM

# Generate the Scoring Formula as an HANA function

- Automated Analytics 3.1 provides a new code type: UDF for SAP HANA.
- The scoring formula of a trained model can be exported as a scalar function.
- This allows real time scoring on new data in HANA
- Works with HANA Calculation Views
- Can be used to support an end to end predictive analytics process with BW Data



## Generating Code

Standard Settings

Advanced Settings

Target to be used: IS\_FRAUD Information to be generated: Score/Estimates

Code Settings

Code type: UDF SQLScript Code for SAP HANA

Note:  
The generated U  
The results are t

Output

Folder:

Generated File:

Scenario

Details

Semantics

Script\_View

```
/****** Begin Procedure Script *****  
BEGIN  
    var_out =  
    Select  
        "CLAIM_ID",  
        "DAYS_TO_REPORT",  
        "BODILY_INJURY_AMOUNT",  
        "PROPERTY_DAMAGE",  
        "PREVIOUS_CLAIMS",  
        "PAYMENT_METHOD",  
        "IS_REAR_END_COLLISION",  
        "PREM_AMOUNT",  
        "AGE",  
        "GENDER",  
        "MARITAL_STATUS",  
        "INCOME_ESTIMATE",  
        "INCOME_CATEGORY",  
        "POLICY HOLDER",  
        sum(NB_OF_CLAIMS) AS NB_OF_CLAIMS,  
        APL_SAMPLES.CLAIMS_FRAUD_SCORE(  
            CAST(DAYS_TO_REPORT AS INTEGER),  
            CAST(BODILY_INJURY_AMOUNT AS INTEGER),  
            PAYMENT_METHOD, CAST(AGE AS INTEGER),  
            GENDER, INCOME_ESTIMATE,  
            CAST(INCOME_CATEGORY AS INTEGER)  
        ) AS IS_FRAUD_SCORE  
    from  
        "_SYS_BIC"."ADV_SAMPLES/CV_AUTO_CLAIMS_NEW"  
    GROUP BY  
        "CLAIM_ID",
```

Output

Columns

CLAIM\_ID  
DAYS\_TO\_REPORT  
BODILY\_INJURY\_AMOUNT  
PROPERTY\_DAMAGE  
PREVIOUS\_CLAIMS  
PAYMENT\_METHOD  
IS\_REAR\_END\_COLLISION  
PREM\_AMOUNT  
AGE  
GENDER  
MARITAL\_STATUS  
INCOME\_ESTIMATE  
INCOME\_CATEGORY  
POLICY HOLDER  
NB\_OF\_CLAIMS  
IS\_FRAUD\_SCORE

Input Parameters

Properties

General

Property	Value
Name	CV_FRAUD_PREDICTION
Label (English)	CV_FRAUD_PREDICTION
Package	ADV_SAMPLES
Activated By	USER_APL
Activated At	2016-09-13 13:02:41.0

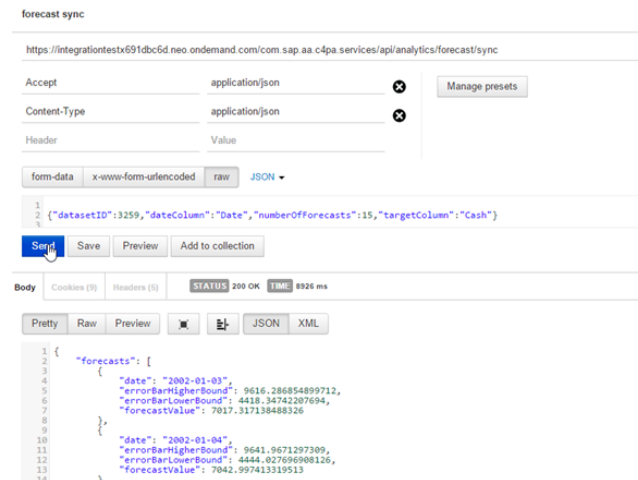
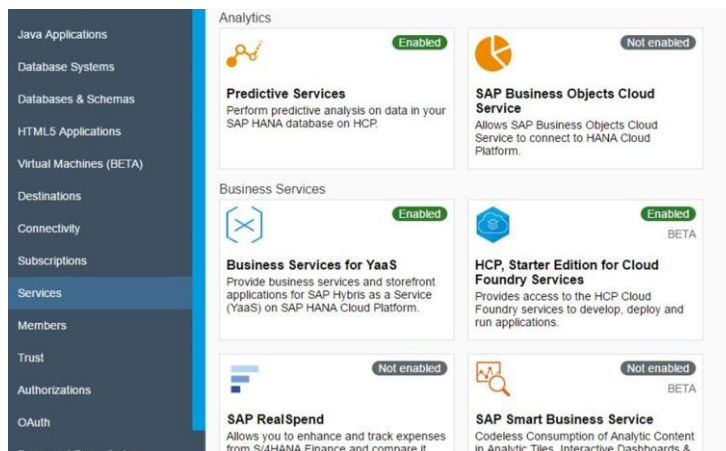
# SAP HANA Cloud Platform predictive services

## What Is It?

SAP HANA Cloud Platform predictive services are REST Based Cloud Services which enable developers on the SAP HANA Cloud Platform (HCP) to embed SAP BusinessObjects Predictive Analytics quickly and easily into their applications. Technological foundation to SAP BusinessObjects Cloud predictive option.

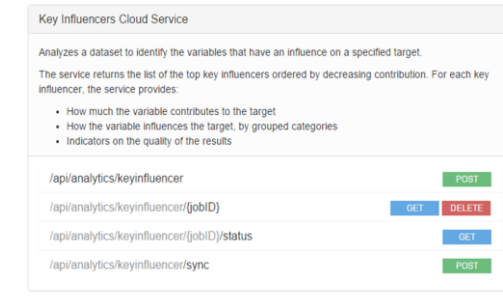
## What value does it deliver?

- Fastest way to include accurate predictive models in Business Applications on SAP HANA Cloud Platform
- Based on SAP BusinessObjects Predictive Analytics Intellectual Property, which abstracts developers from the details of implementing predictive models while providing extremely robust results
- Provides access to APL libraries in SAP HANA Cloud Platform



## Cloud Services for Predictive Analytics API documentation version 1.0

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[Key Influencers Cloud Service](#)  
[Scoring Equation Cloud Service](#)  
[Forecasts Cloud Service](#)  
[Outliers Cloud Service](#)

# WHAT'S NEW IN PREDICTIVE ANALYTICS

## Overview

### **Next version will be Predictive Analytics 3.2**

Focus on HANA

- Full support for HANA Views
  - Improve BW/4HANA support

Improve Vora Support

Focus on Factory

- Segmented Classification & Regression

### **New SCP predictive services**

New service for Recommendation



# WHAT'S NEW IN PREDICTIVE ANALYTICS

## Apply a Model in SAP HANA Smart Data Streaming



- **Automated Analytics now supports HANA Spark Data Streaming**
- **Generates CCL Code which can be deployed to HANA SDS**
- **Smart Data Streaming Use Cases**
  - IOT Data for Predictive Maintenance and Quality
  - Clickstream analysis for Marketing
  - Connected Retail

Predictive Analytics  
Automated  
Modeller

**Generating Code**

Standard Settings Advanced Settings

Target to be used: IS\_FRAUD Information to be generated: Score/Estimates

**Code Settings**

Code type: CCL code for SAP HANA Smart Data Streaming

**Note:**  
The generated CCL code is a dedicated code for SAP HANA Smart Data Streaming. The results are the same as when using Automated Predictive Kernel.

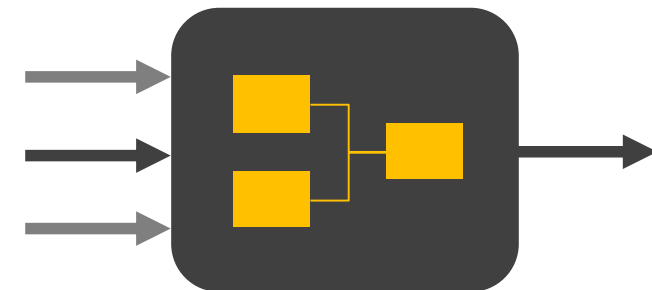
**Output**

Folder: C:/Users/I050581/Documents/PA30\_EKT Browse

Generated File: FRAUD\_DETECTION.ccl Browse



HANA Smart Data  
Streaming



# WHAT'S NEW IN PREDICTIVE ANALYTICS

## Native Spark Modelling



Execute automated predictive models directly on Hadoop using the Apache Spark engine

Push the data intensive modelling workload to Native Spark - Classification and Regression models supported

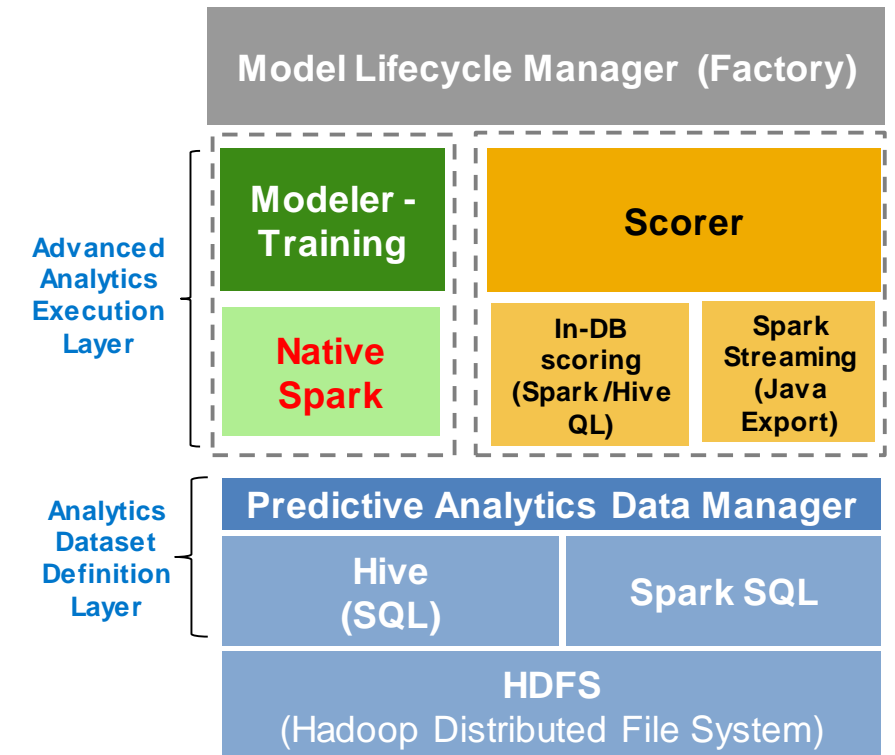
Model Lifecycle management on Hadoop with RETRAIN and APPLY

User structure and custom cutting strategy supported on Native Spark

Real Time Scoring via Spark Streaming API

## Benefits

- **No data transfer** – heavy lifting operations brought close to data
- **Faster response times** – 7 to 10 times performance gains
- **Higher scalability** – scale your training process with wider and data more models
- **Better utilization of CPUs** – in distributed Hadoop environment
- **Abstraction** – Analysts can work with Big Data seamlessly





# WHAT'S NEW IN PREDICTIVE ANALYTICS

## SAP Predictive Analytics V3.2



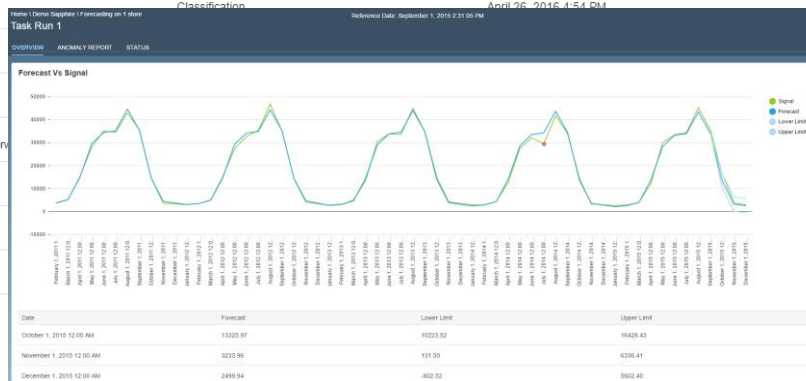
### Machine learning at scale

Scale and manage peak performance  
for thousands of models



Models (9)

<input type="checkbox"/>	Name	Type	Creation Date
<input type="checkbox"/>	<b>Churn Likelihood estimation</b> Model 'Churn Likelihood estimation' imported from modeling server.	Classification	April 26, 2016 4:32 PM
<input type="checkbox"/>	<b>Customer Life Time Value</b> Model 'Customer Life Time Value' imported from modeling server.	Regression	April 26, 2016 4:20 PM
<input type="checkbox"/>	<b>Fraud Detection</b> Model 'Fraud Detection' imported from modeling server.	Classification	April 26, 2016 4:54 PM
<input type="checkbox"/>	<b>High profile prospects</b> Model 'High profile prospects' imported from modeling server.		
<input type="checkbox"/>	<b>Next Best Offer</b> Model 'Next Best Offer' imported from modeling server.		
<input type="checkbox"/>	<b>Preferred Channel Targeting</b> Model 'Preferred Channel Targeting' imported from modeling server.		
<input type="checkbox"/>	<b>Product X Propensity</b> Model 'Product X Propensity' imported from modeling server.		
<input type="checkbox"/>	<b>Revenue Forecasting</b> Model 'Revenue Forecasting' imported from modeling server.		
<input type="checkbox"/>	<b>Visits_Forecasting</b> Model 'Visits_Forecasting' imported from modeling server.		



### The Predictive Factory

- Automate - retrain, score, manage, govern and deploy models
- Segmented Forecasting model management
- Scheduling, administration, notification
- Openness to external executables - Integrate with SAP & third party apps
- Streamlined predictive user experience and workflow

# WHAT'S NEW IN PREDICTIVE ANALYTICS

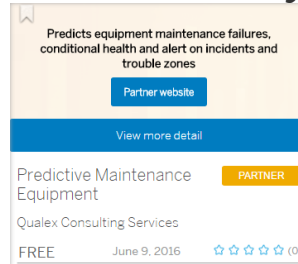
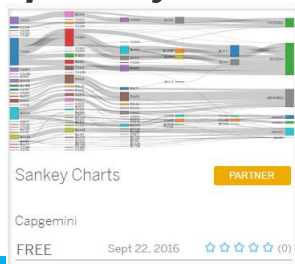
## SAP Cloud Platform predictive services

**Ready-to-be-integrated services developed by data-scientists that delivers predictive analytics insights (Dataset, Forecast, Key Influencer, Outliers, Scoring equation, Recommendation)**

**Applications Highly specific built by IT organizations that respond to specific business needs**

**All the data mining process is packaged inside the service and is hidden from the business user**

**Applications can be published and monetized in the *Sap Analytics extensions directory***

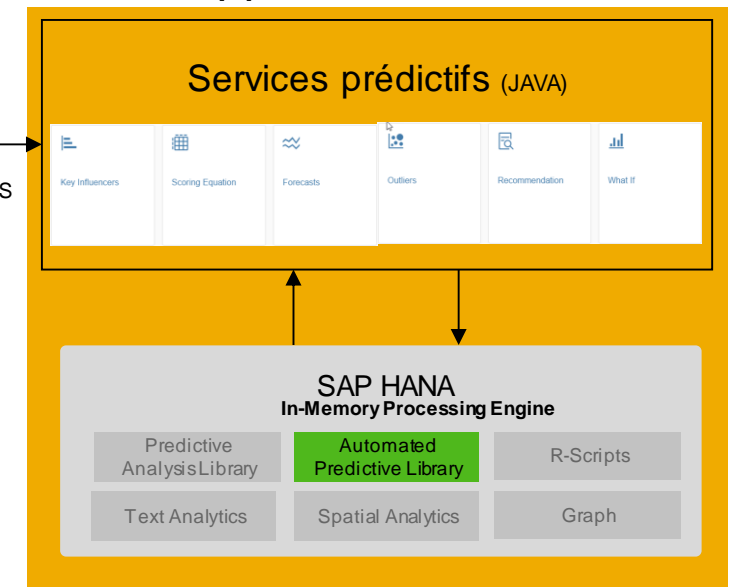


Web Application  
HTML Pages / JavaScript



HTTPS

Application Server



# CUSTOMER SUCCESS: MONEXT



## Reducing Fraud for Electronic Transactions

- Develop custom-tailored predictive modeling for each unique card provider and card type, including credit, debit, prepaid, and luxury cards to better predict the risk of fraud of each one.

### Results:

**1** half-time analyst to build models

**60%** of fraudulent transactions stopped by targeting 1% of the transactions

**Millions** of euros €'s saved in lost revenue

### Why SAP

- Very productive even with a **small team** to build and maintain a lot of customized models
- Easy to maintain the **performance** of the models
- Easy integration with the existing **IT infrastructure**

### Resolution

- Analysis of **Big Data** from hundreds of millions of transactions, and up to 500 native and derived attributes used to evaluate electronic transactions in milliseconds
- **Predictive** modeling based on transactional data
- Models for batch and for **real time** execution



# KOLON Benit DISCOVER

발견하다.

우리의 삶을 더 편안하고  
행복하게 만드는 새로운 발견

「구미 행복공장 만들기 프로젝트」

# KOLON BENIT

- KOLON Corporation
  - One of the biggest corporations in South Korea:
    - Market research, Consulting Services, Outsourcing,
    - Retail motor vehicles, Trade of steel, Natural resources, Chemical,
    - Construction, Hotels, Golfs, Shopping malls,
  - 27 affiliated domestic companies including KOLON Benit,
  - 17 overseas subsidiaries.
  
- KOLON BENIT Co. Ltd.
  - IT provider specialized in IT services & Outsourcing services
  - 500 employees and 500M USD
  - Provides IT Services, IT outsourcing, and IT compliance solutions.
  - Reseller for real-time SAP Database (HANA, ASE, IQ, NetWeaver, EIM, and BI)





# Kolon Benit

## *Software Vendor activity*

- Develop and provide a Factory Automation solution for performance and analytics, dedicated to high tech industry



## *Business need*

- Follow the evolution of the customers production environment (IoT, big data, real time, Predictability...)



## *The SAP on premise choice*

- Migration From Oracle to SAP HANA
  - HANA SDS real time engine
  - SAP BusinessObjects Predictive Analytics



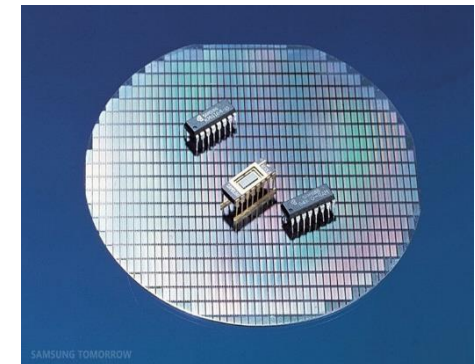
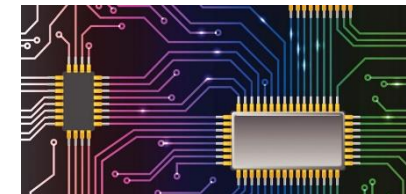
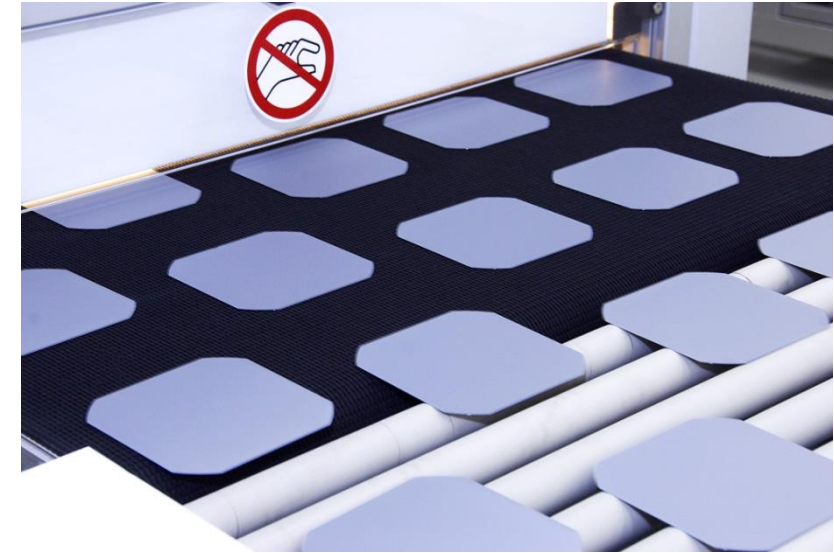
# Kolon Benit

## *Database needs*

- Performances & real time capabilities:
  - Compare loading methods and validate the most efficient,
  - Load 5% of the 150 TB bytes of data with HANA (50 billion records).

## *Predictive needs*

- Root Cause Analysis for product failure:
  - Combine wafer inspection information and equipment sensing information.
- Scoring on potential issues by processes:
  - Hundreds of processes for each production line,
  - Pre-calculate the score for potential failures as the wafer goes through each process.
- Quality analysis for produced wafer.
  - Detect differences of quality for wafers produced under the same process conditions.
- Predictive Maintenance for their facilities:
  - Operates more than 8,000 facilities per line.
  - Be proactive before the equipment breaks down.



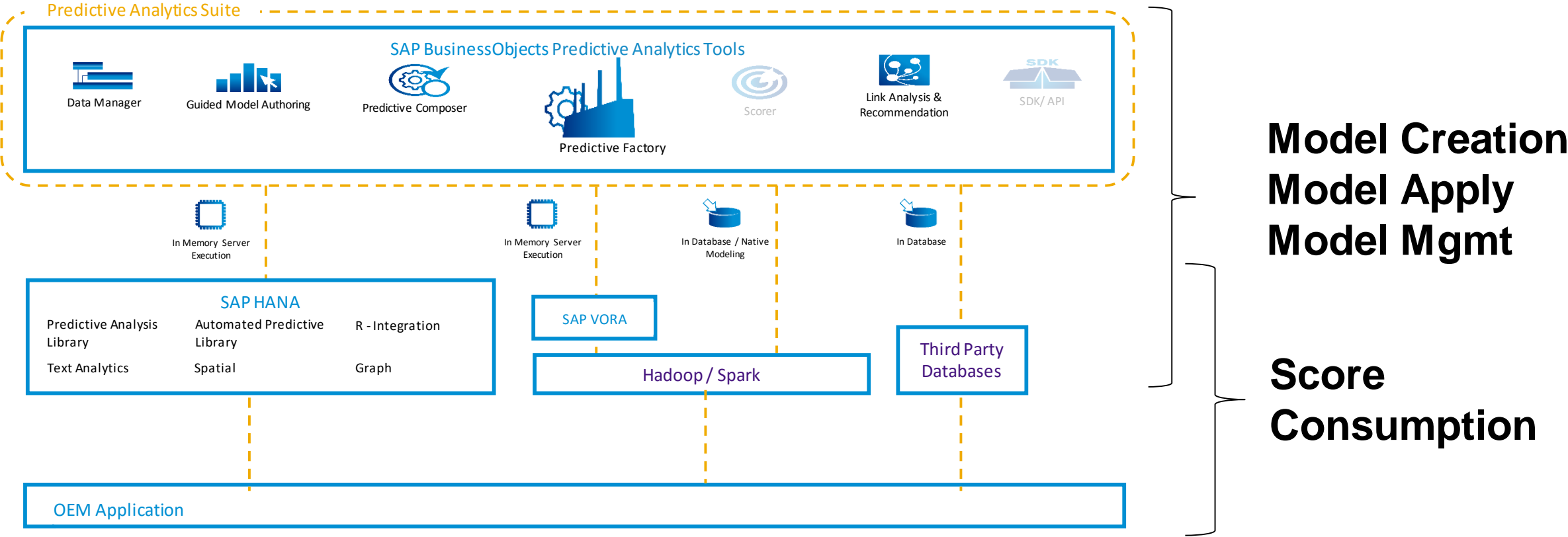
# Overview on OEM Scenarios : On-Premise Application

Factory	<ol style="list-style-type: none"><li>1. Model created in PA Modeler (OEM)</li><li>2. Model Management and Batch-Scheduling in Predictive Factory (Customer)</li><li>3. OEM application consumes scores written by Factory</li></ol>
Scorer	<ol style="list-style-type: none"><li>1. Model created in PA Modeler</li><li>2. Model exported as scoring function (Java, C++, SQL, UDF, CCL, HTML, ..)</li><li>3. Scoring function embedded into application</li></ol>
API	<ol style="list-style-type: none"><li>1. Model created in PA Modeler</li><li>2. Model export as KxScript</li><li>3. KxScript called from application</li></ol> <p>Alternative: Use Java/C++ API of PA server instead of KxScript</p>
SQL	<ol style="list-style-type: none"><li>1. Manually code SQLScript procedure or HANA view using APL, PAL or R</li><li>2. Consume SQL Script procedure or HANA view directly from BW, ABAP or any HANA-consuming app</li></ol>

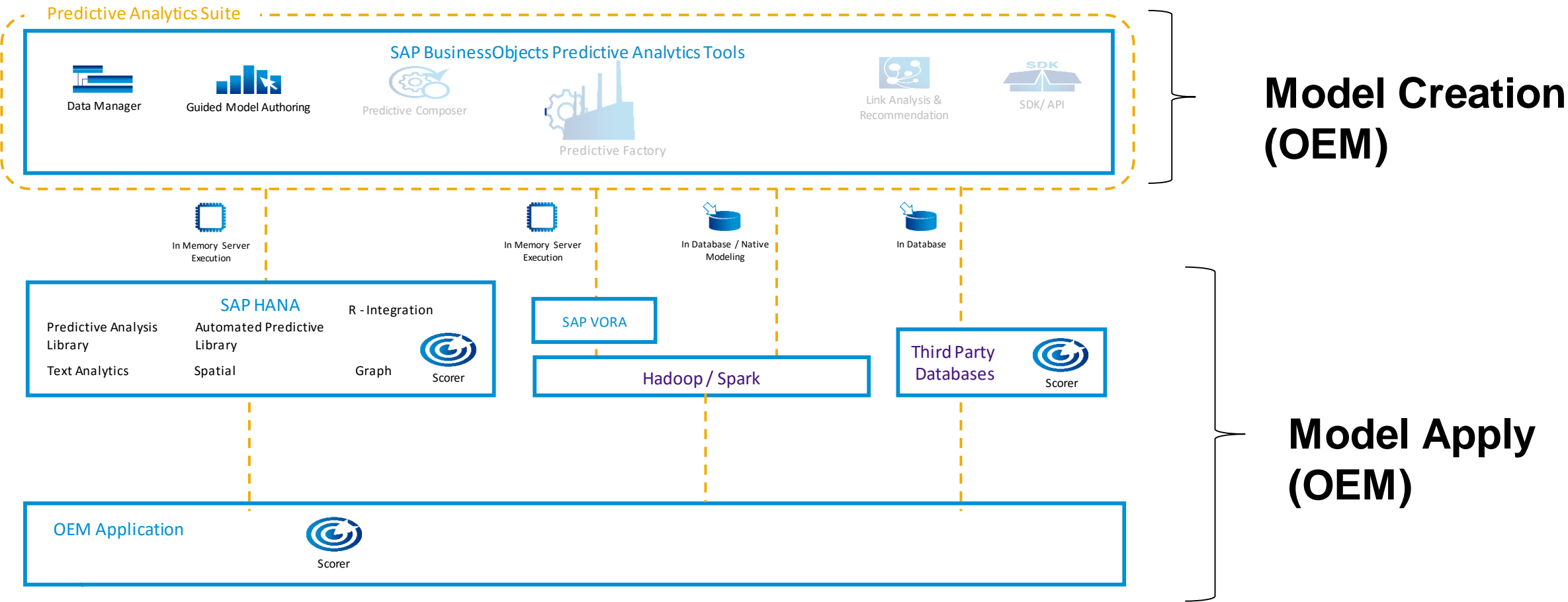
# Overview on OEM Scenarios: Cloud Application

SCP Predictive Services	1. Call SCP Predictive Services from SCP application
PAI REST (upcoming)	<ol style="list-style-type: none"><li>1. Model created in PA Modeler</li><li>2. Generate REST Service for Model and publish to SCP</li><li>3. Call REST service from SCP application</li></ol>

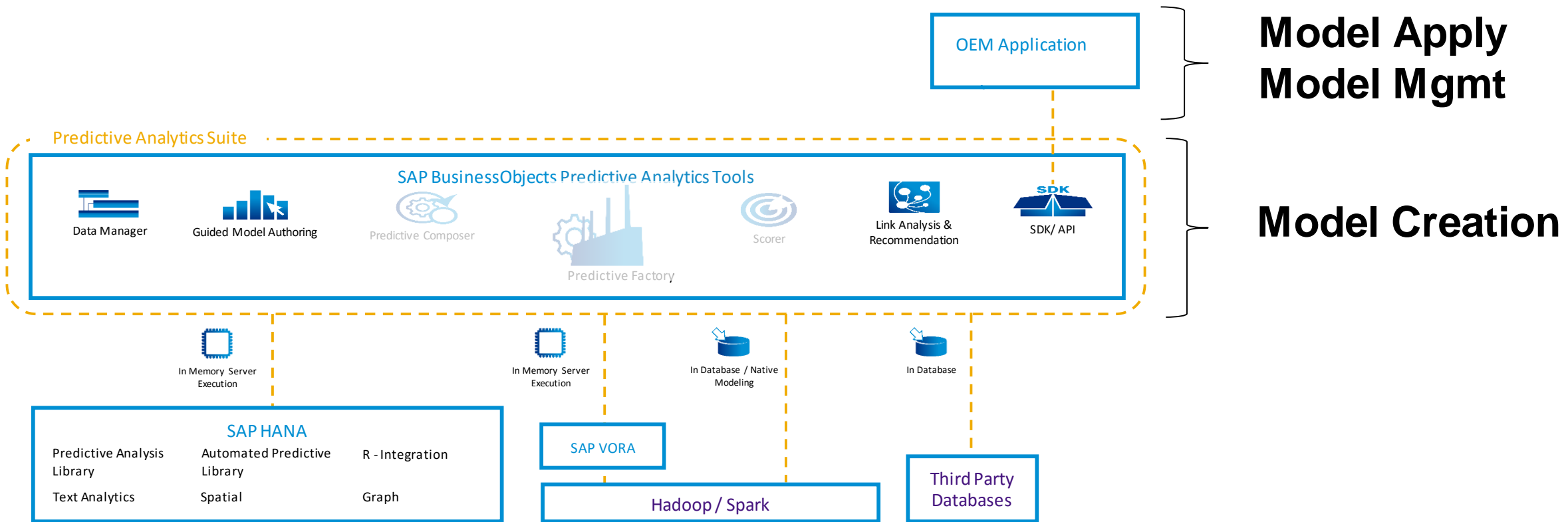
# On-Premise via Predictive Factory



# On-Premise with Scorer



# On-Premise via API

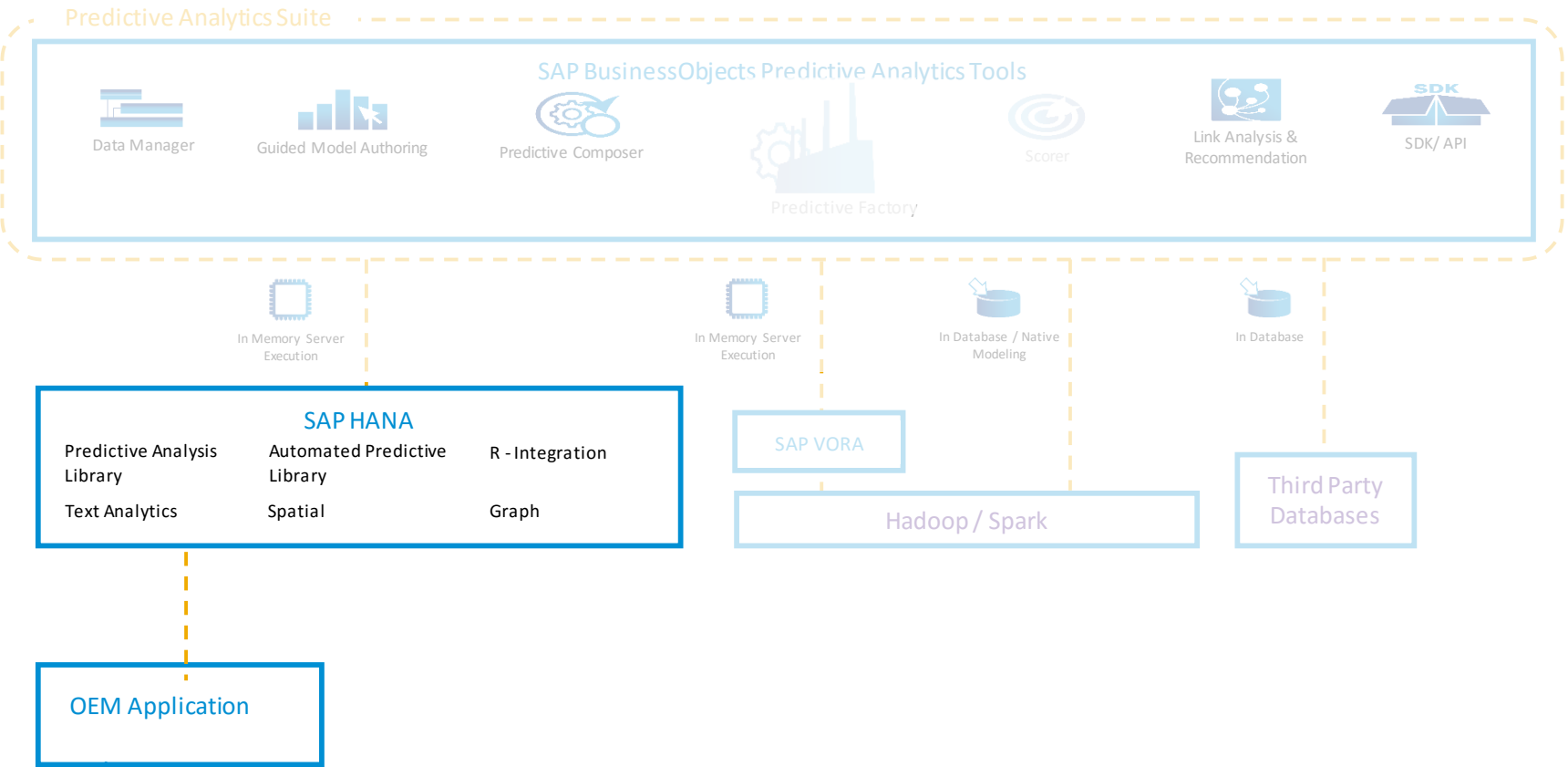


**Model Apply  
Model Mgmt**

**Model Creation**

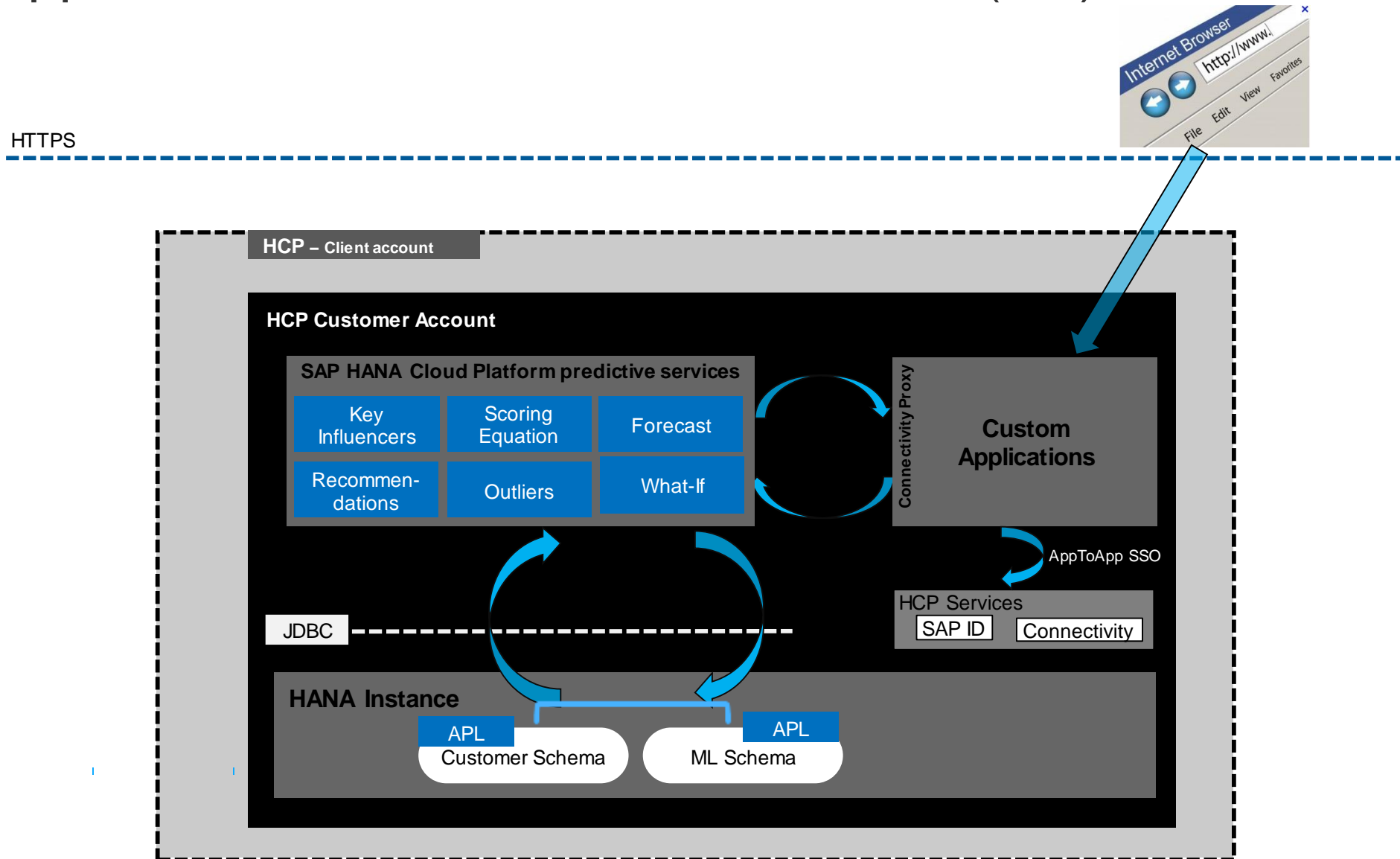


# On-Premise via SQLScript

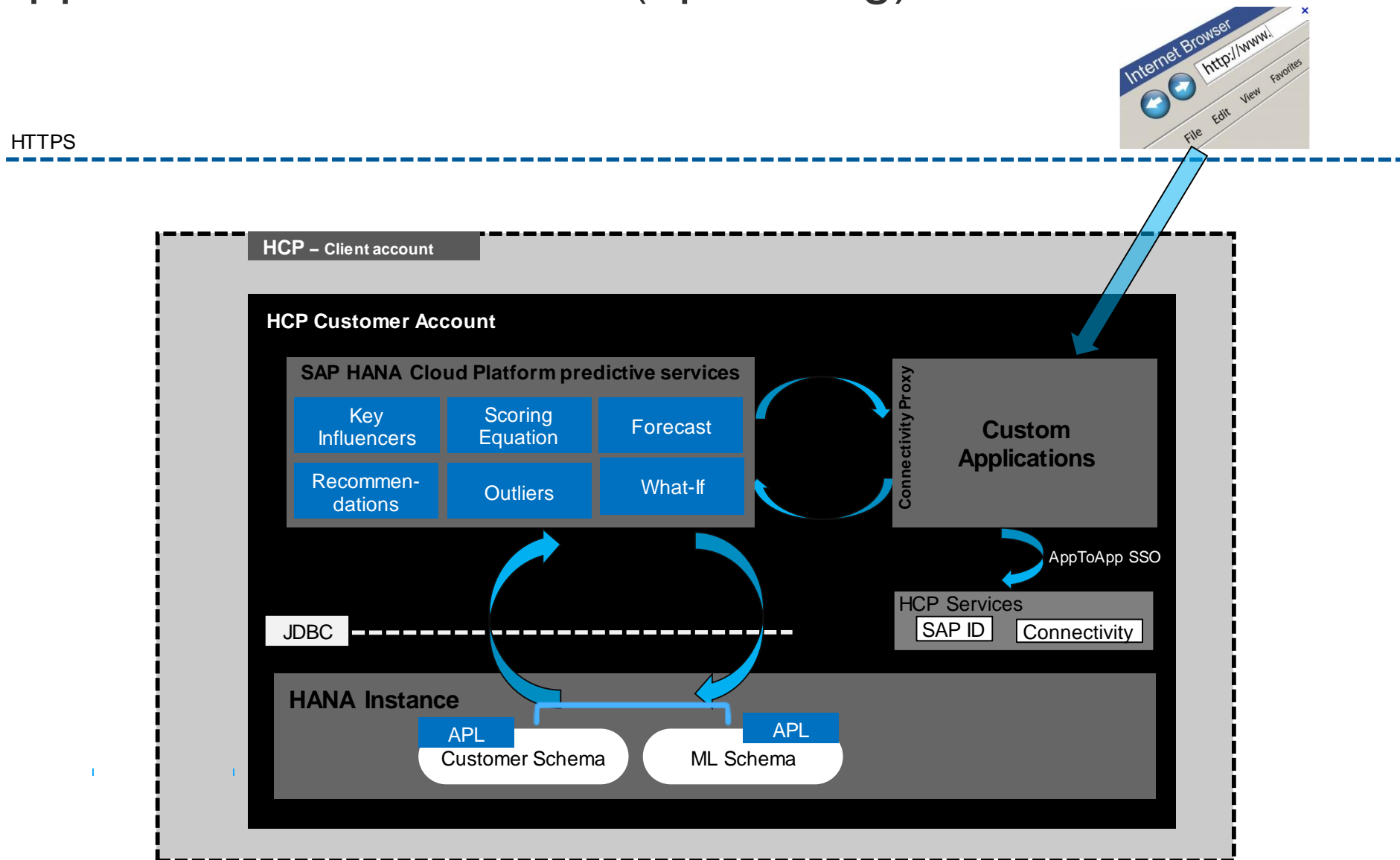


**Model Creation**  
**Model Apply**

# Cloud Application via SCP Predictive Services (1/2)



# Cloud Application via PAI REST (upcoming)



# Key links for more information

For customers and partners

## Key links

- Roadmaps on SAP Service Marketplace
- SAP Community Network
- Predictive Analytics Community
- SAP BusinessObjects Predictive Analytics 30 days Trial Download
- SAP BusinessObjects Predictive Analytics

<http://go.sap.com/solution/roadmaps.html>

<http://scn.sap.com/>

<http://scn.sap.com/community/predictive-analytics>

<https://www.sap.com/trypredictive>

<http://go.sap.com/solution/platform-technology/predictive-analytics.html>

## Where to go to provide product feedback and ideas

- SAP Idea Place
- Predictive Idea Place
- Influence programs

<https://ideas.sap.com>

<https://ideas.sap.com/PredictiveAnalytics>

<http://service.sap.com/influence>

## Sign up to our newsletter

<http://scn.sap.com/docs/DOC-66912>

# THANK YOU

A hand-drawn illustration of the text 'Q&A' in a black, sketchy, and textured font. The characters are centered on a rectangular yellow background with a thin black border. The 'Q' has a thick, textured outline and a small crossbar. The ampersand is also hand-drawn and textured. The 'A' is tall and narrow with a textured outline.