PERFORMANCEANALYTICS
ANALYTICS FOR THE OFFICE OF THE CFO

SAP

The Performance Exchange

Thursday November 26th 2015

The CN Tower

SAP BPC with Predictive Analytics & HANA
A winning combination

PERFORMANCEANALYTICS
OFFICE OF THE CFO SOLUTION SPECIALISTS

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Solution Architect
Performance Analytics

The Performance Exchange – 2015

Agenda

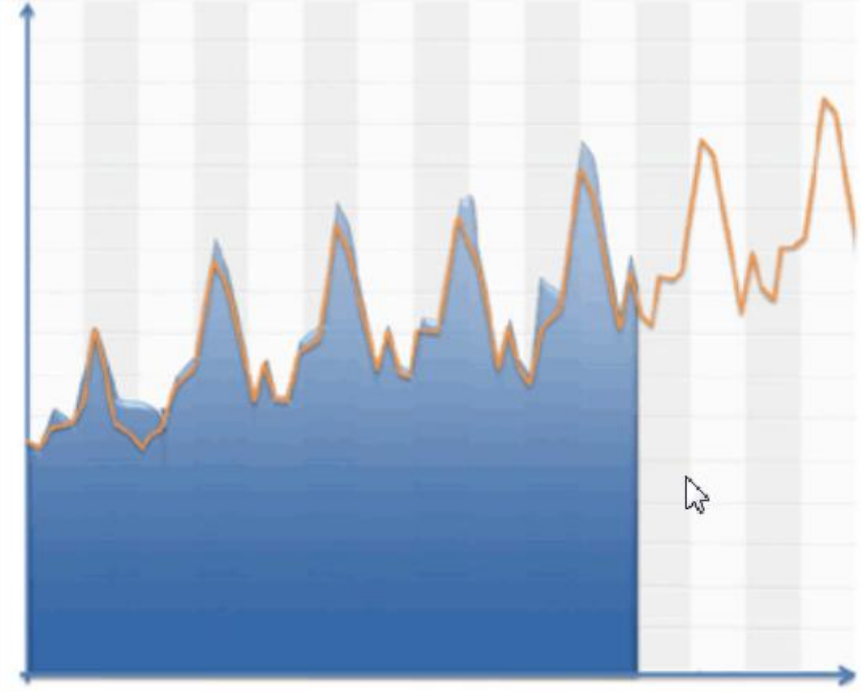
- The value of predictions
- Predictive Analytics Overview
- Analytics Maturity
- Predictive Applications
- Predictive Algorithms
- Scenarios to integrate SAP Predictive with SAP BPC
- Challenges and opportunities

The value of predictions

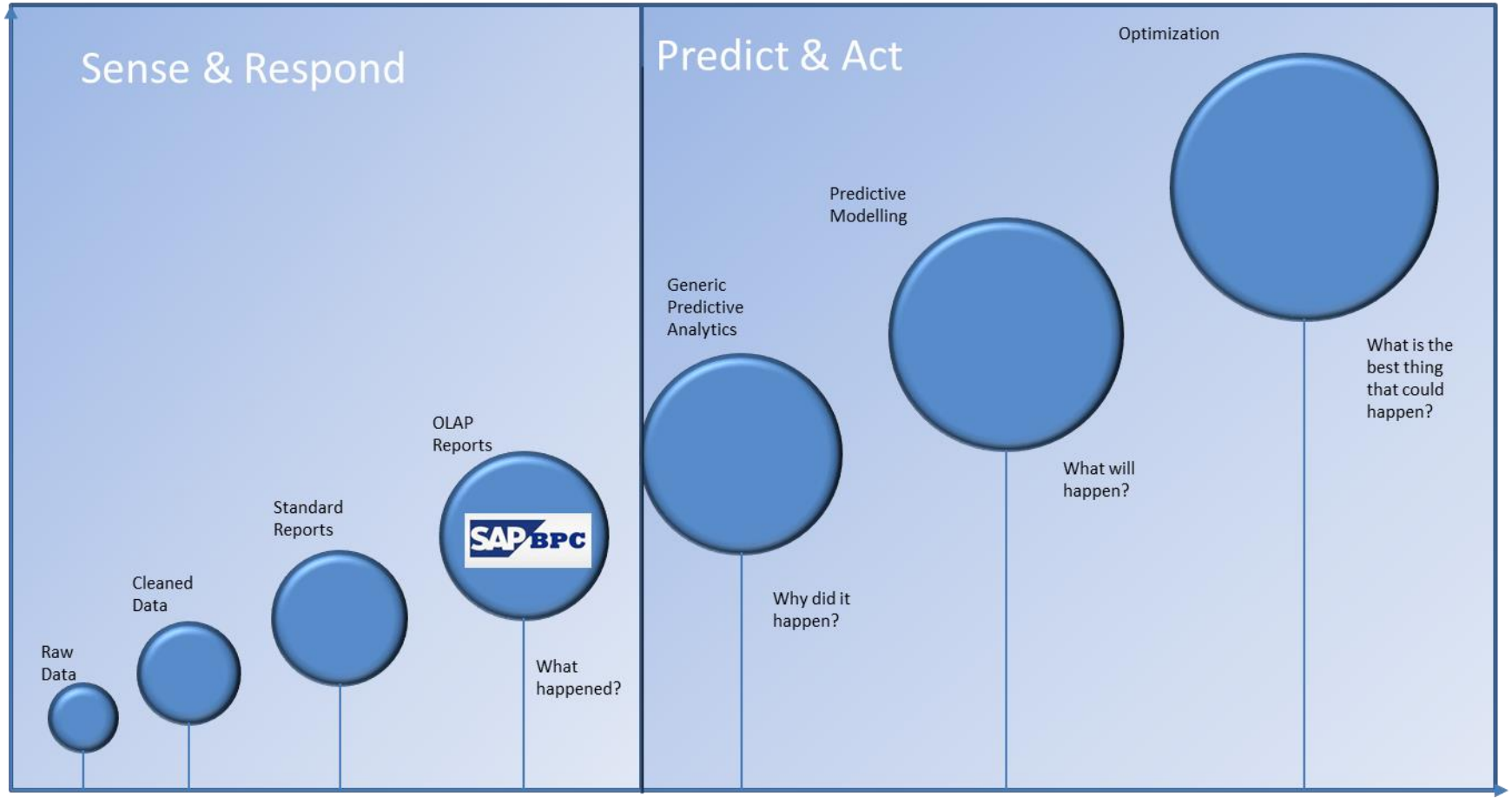
Predictive - Overview

SAP Predictive Analytics

It’s a statistical analysis and data mining solution that enables companies to build predictive models in order to discover hidden insights and relationships In your data, from which you can make predictions about future events.



Analytics maturity

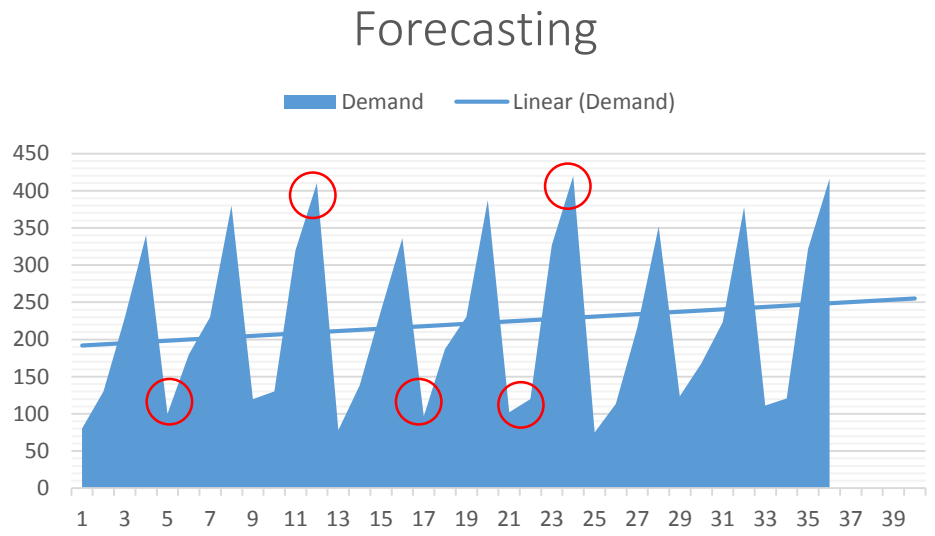


Predictive – Applications

Forecast	• Predict expenses and revenue based on historical data using time series algorithms.
Financial Services	• Predict deposit revenue based on demographic data, interest rate projections and historical regression trends. • Detect frauds and anomaly behavior.
Utilities	• Predict utility consumption based on historical usage of customer cluster groups and weather forecast.
Retail and Consumer Products	• Predict product demand based on historical trends at a region, store and product level historical trend and driving factor assumptions.
Public Sector	• Predict tax revenue based on historical demographic trends and economic assumptions.

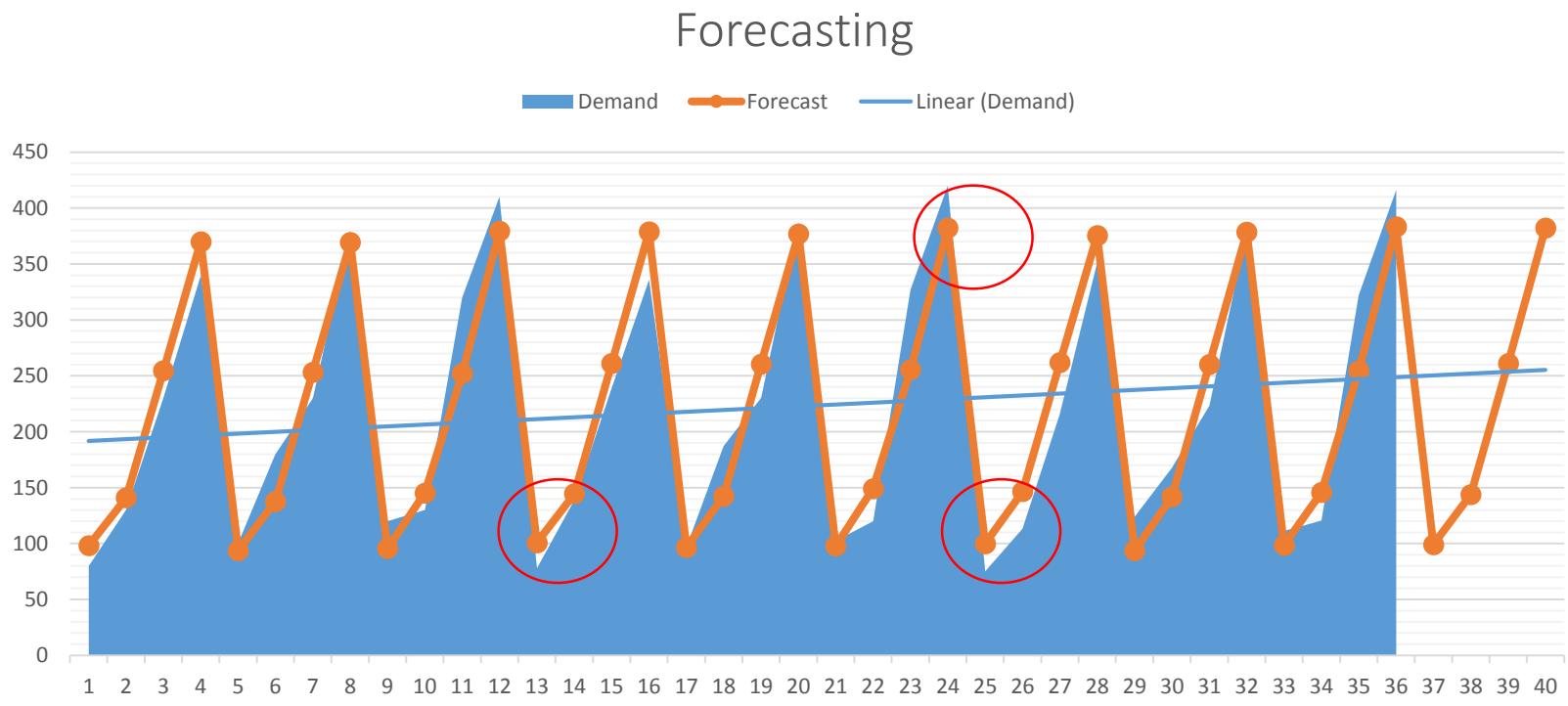
Algorithms- Time Series

- Triple exponential smoothing
- This method is based on three smoothing equations: stationary component, trend, and seasonal.



Algorithms- Time Series

Forecasting



Algorithms- Time Series

PA Algorithm

- INSERT INTO #PAL_CONTROL_TBL VALUES ('ALPHA', NULL,0.5, NULL);
- INSERT INTO #PAL_CONTROL_TBL VALUES ('BETA', NULL,0.1, NULL);
- INSERT INTO #PAL_CONTROL_TBL VALUES ('BASE', NULL,0.1, NULL);
- INSERT INTO #PAL_CONTROL_TBL VALUES ('FORECAST_NUM',4, NULL, NULL);
- INSERT INTO #PAL_CONTROL_TBL VALUES ('MEASURE_NAME', NULL, NULL, 'MSE');
- CALL TADEOH.TRIPLESMOOTH_TEST_PROC(PAL_TRIPLE_DATA_TBL, "#PAL_CONTROL_TBL", PAL_TRIPLESMOOTH_RESULT_TBL, PAL_TRIPLESMOOTH_STATISTIC_TBL)WITH OVERVIEW;

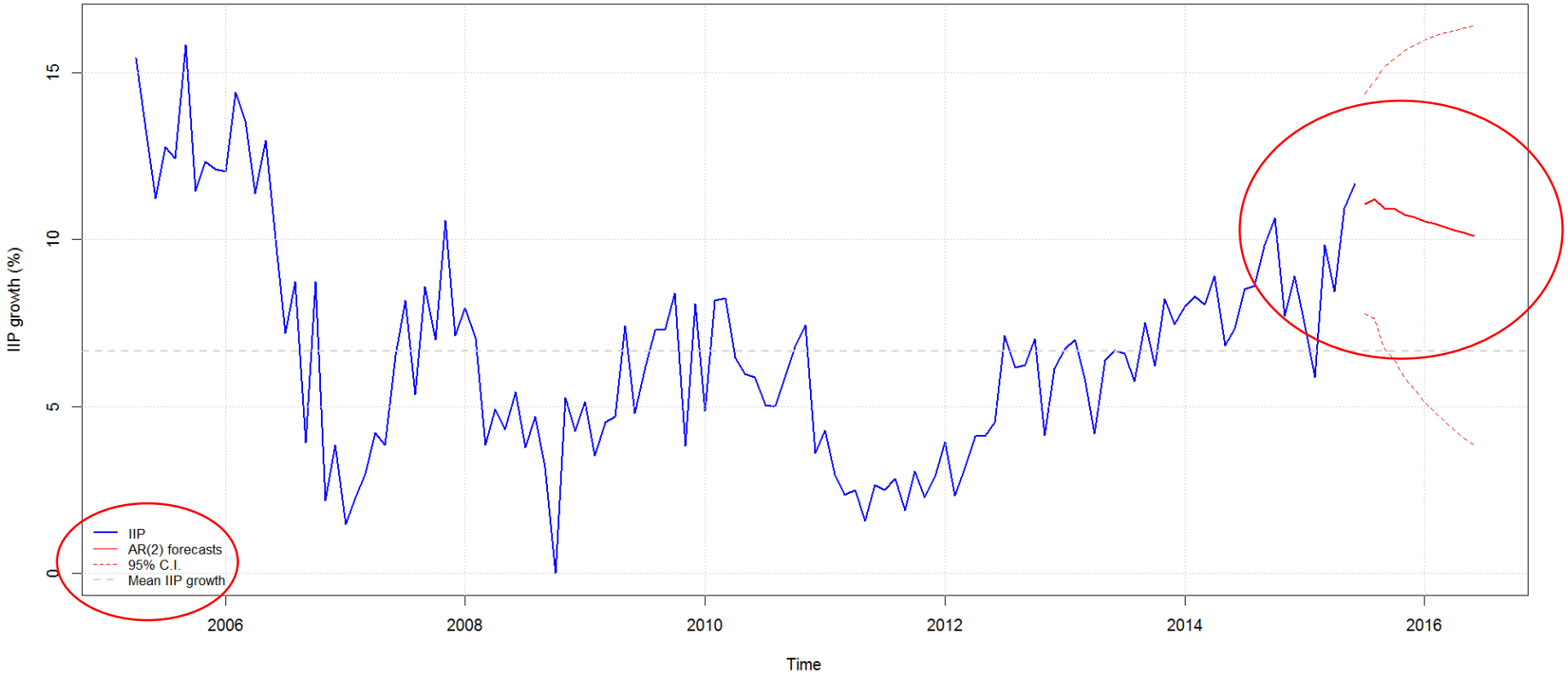
```
Statement 'CALL TADEOH.DOUBLESMOOTH_TEST_PROC(PAL_DOUBLESMOOTH_DATA_TBL, "#PAL_CONTROL_TBL", ...'
successfully executed in 4.644 seconds  (server processing time: 4.638 seconds)
Fetched 2 row(s) in 0 ms 112 µs (server processing time: 0 ms 0 µs)
```

```
SELECT * FROM PAL_DOUBLESMOOTH_RESULT_TBL
```

	TIME	OUTPUT
1	2	152
2	3	161
3	4	170
4	5	162.350768
5	6	156.617348328704
6	7	172.9203989238143
7	8	163.90826054079446
8	9	158.08385671344007
9	10	165.83974232422298
10	11	179.23871805888433
11	12	177.35911591266023
12	13	179.69880841249295
13	14	199.35005155285404
14	15	202.41396282027966
15	16	211.12228207587194
16	17	221.2268264253716
17	18	232.06038797295594
18	19	235.20765287024005
19	20	225.13141559964953
20	21	231.69377677811428
21	22	232.6507930902281
22	23	242.98458882162217
23	24	246.49442080361422
24	25	262.4764322154003
25	26	268.6861484497971

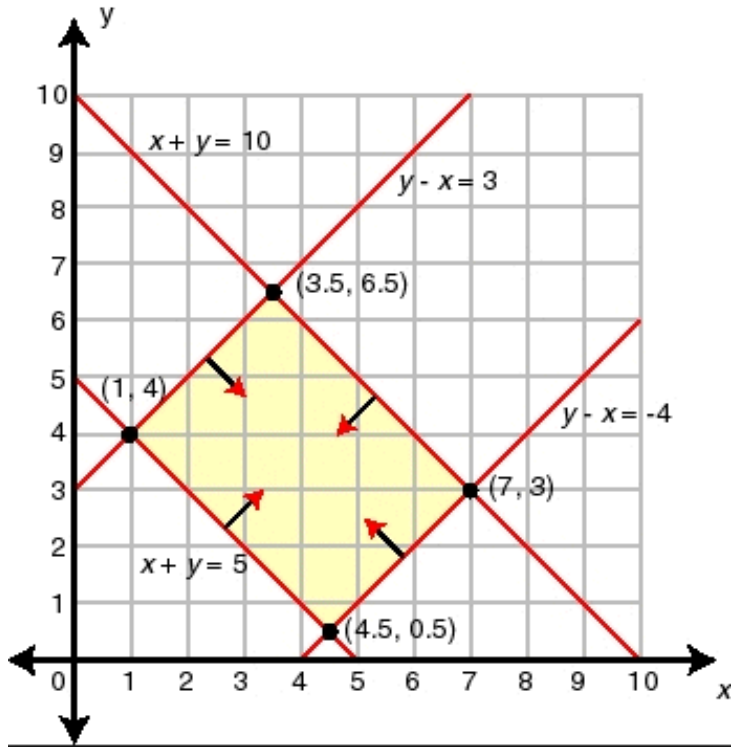
Algorithms- Time Series

Forecasting



Algorithms – Linear programming

- R integration
  - It's maximizing or minimizing linear functions subject to linear constraints.
  - MAX: PROFITABILITY
  - MIN: COST
  - Constrained by: Demand, Prices, Macroeconomic conditions, FX rates, installed capacity, and so on.



Algorithms – Association Analysis

Apriori algorithm

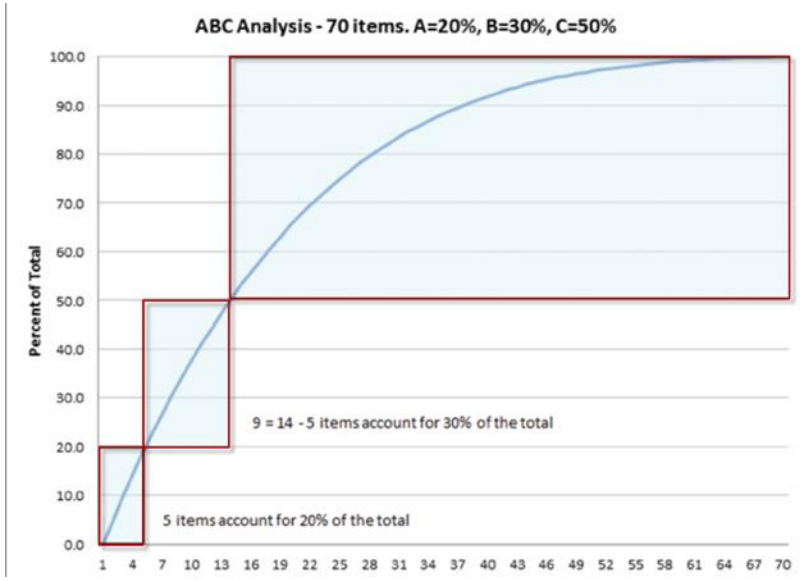
- Also named Affinity analysis, is a form of analysis that looks for associations between objects.
- Can be used for looking at what products are bought together in a shopping basket.
- Can be used for product placement.
- "if item A is purchased, then so is item B."

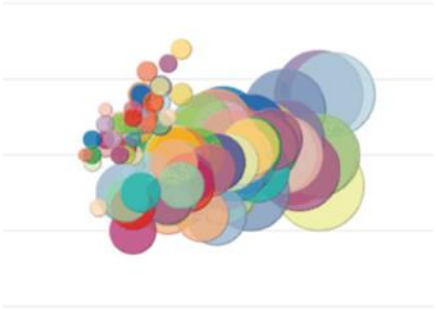
If Pa then Pb	No. Baskets supporting the Rule	Confidence
If P6 then P5	3	60%
If P3 then P2	2	66%
If P4 then P2	2	50%
If P6 then P4	2	40%
If P2 t hen P1	1	16%

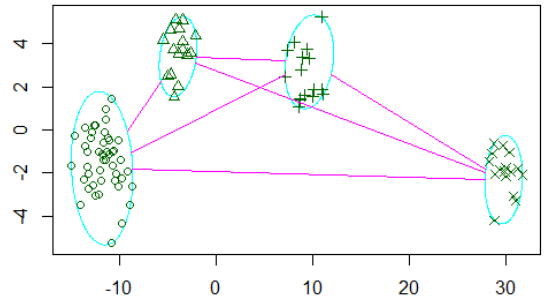
Algorithms – Cluster Analysis

Cluster algorithms

- Cluster analysis is concerned with organizing data into groups with similar characteristics. Ideally the data within a group is closely matched, while the groups themselves are very dissimilar.
  - ABC Analysis
  - K- Means



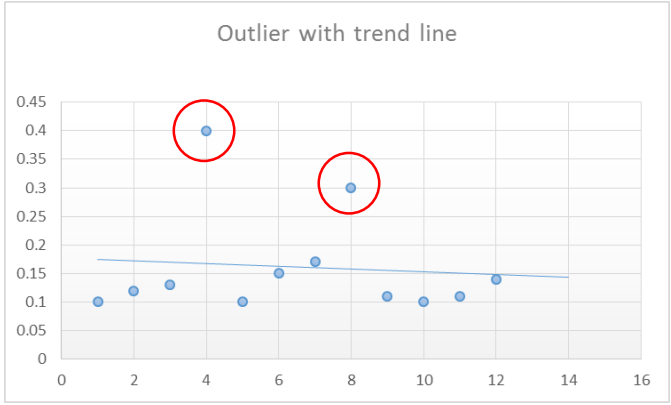




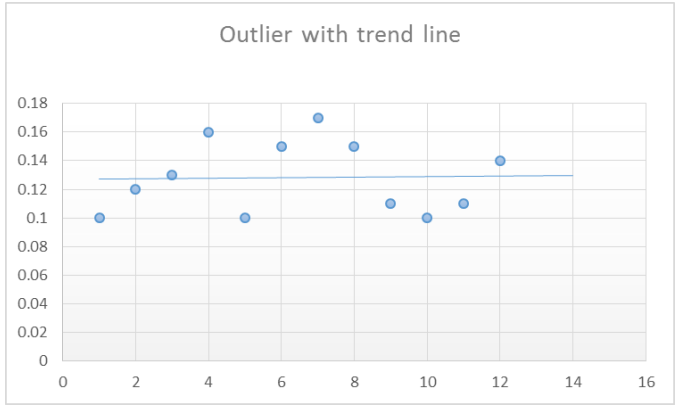
Algorithms – Outlier analysis

Inter quartile range test

- Outliers may exist because of errors in the data that need to be corrected before beginning any analysis.
- Outliers may occur naturally in the data as they are genuinely different from other values and therefore model building has to take into account these variations.
- Can be used for Anomalies detection and to prevent frauds or small robberies.



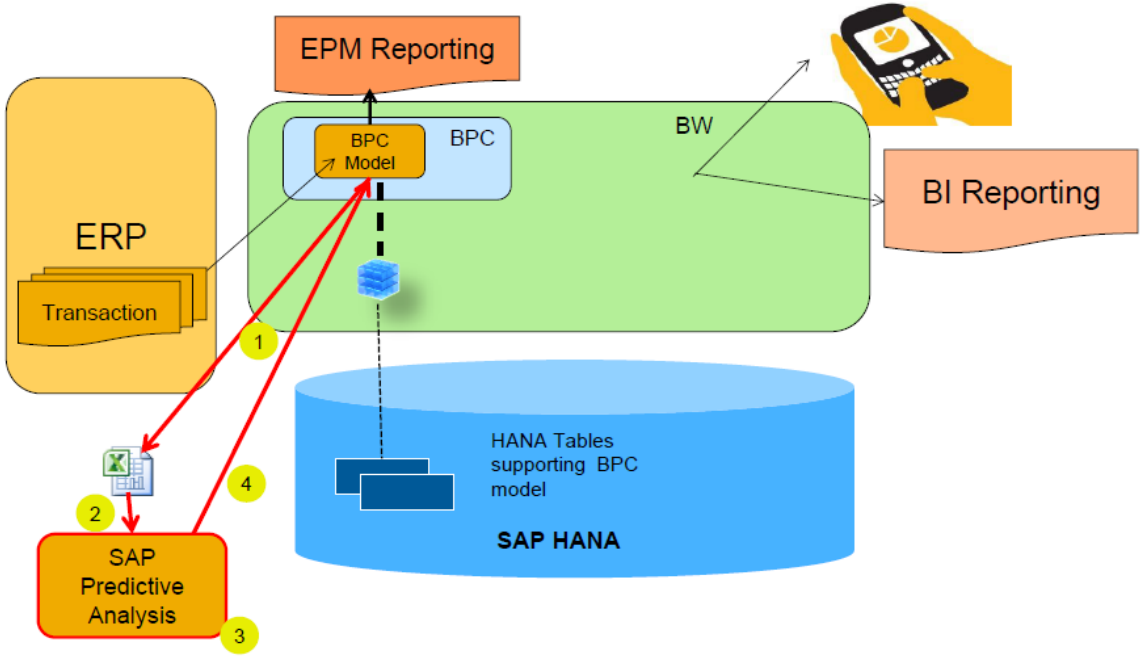
With Outliers



Without Outliers

Scenarios

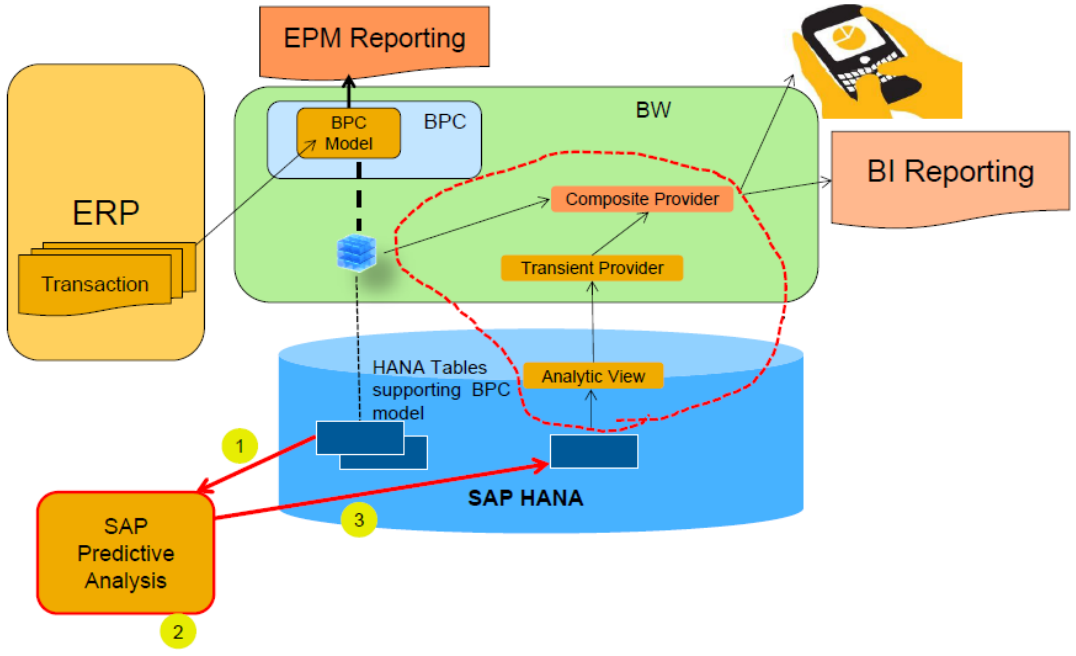
- Scenario 1-Offline BPC Data Extracts



1. A flat file extract from BPC data is created.
2. It is imported into the SAP Predictive Analytics application
3. Execute predictive algorithms to generate a forecast
4. Results get into BPC using an input form or importing a flat file.

Scenarios

- Scenario 2- Accessing SAP HANA Online



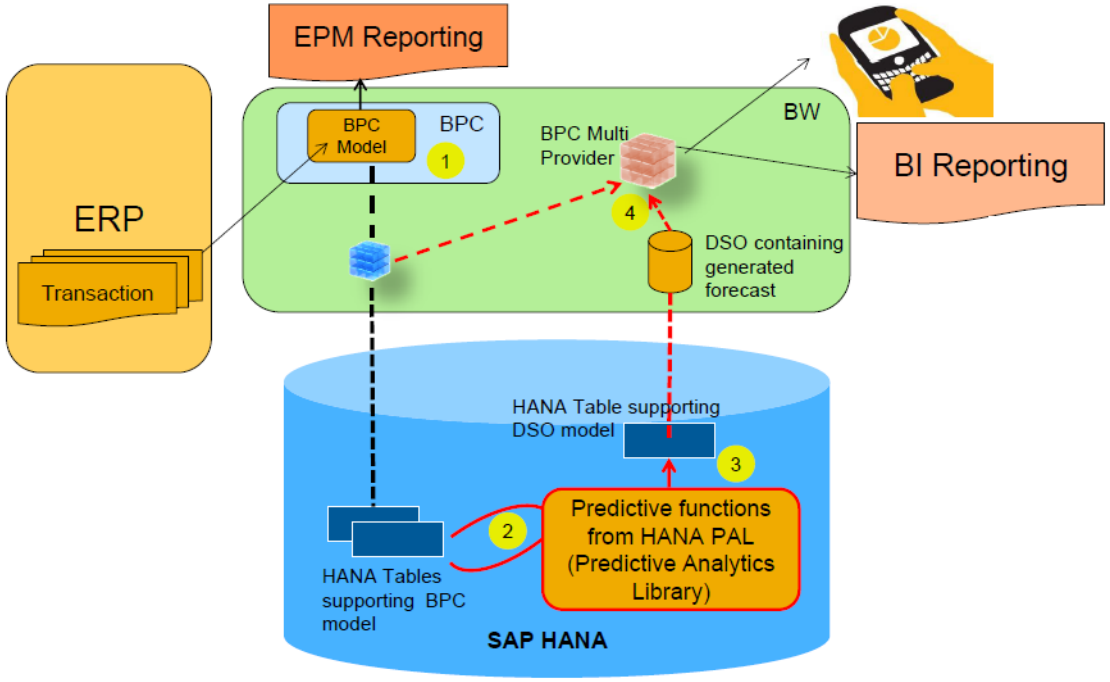
1. BPC data can be accessed directly from the supporting HANA database tables, importing this data directly into the SAP Predictive Analysis application.

2. Execute predictive algorithms to filter and/or generate a forecast

3. Export the results to a table in HANA for BI reporting or potentially inclusion into the BPC dataset.

Scenarios

- Scenario 3 - Predictive Analytics Library



1.BOBJ Dashboard is used in the BPC web admin client which executes an ABAP method automatically via the BPC Write Back BAdI.

2.The ABAP method will trigger a stored procedure in HANA that calls the PAL Function.

3.Forecast data generated by HANA procedure is written to a HANA BW schema table supporting a BW DSO.
4.Forecast data in DSO and BPC Finance data in InfoCube are merged with the system generated BPC MultiProvider

Challenges and opportunities

Strengths

- You have an strategic alliance with **Performance Analytics** with more than 12 years focused on Enterprise management.
- A partnership with **SAP**, that is a **global leader** building and supporting sophisticated Business Apps.
- There is an **existing SAP implementation** either SAP ECC or SAP BPC or SAP BW .
- Years and Years of **historical data**.
- **HANA** in **Memory Database.**

Weaknesses

- Lack of **future visibility** that create a sense of **uncertainty**.
- Planning and Forecasting cycles are **too slow**.
- **Lack of accuracy** in Forecasting and predictions.
- **Response time** of existing applications is **not optimal and every month response time is slower.**

Opportunities

- **React faster** to economic conditions.
- **Eliminate Guess work** and calculations delays.
- Adopt a **Data-Driven** decision model rather than purely on intuition.
- **Simplify** System architecture.
- Have a **competitive advantage** by mining data from many sources.

Threats

- Economical conditions **fluctuate dramatically** and sometimes without notice.
- Global prices **increase** o **decrease** sharply.
- Data sets are **too large** to be processed.

Thank you

Q&A