IBM Planning Analytics for
Large-Scale Financial Analytics

Or

IBM Planning Analytics:
The Game Changer for Financial Analytics

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Table of Contents

1 Introduction: The changing role of Financial Analytics in FOPM

Leading companies are increasingly embracing a 'modern' form of Financial and Operational Performance Management (FOPM). The focus of modern FOPM is less on forecasting and planning, but on linking finance and operations by analyzing financially relevant business activities, causal relationships, customer and market behavior, and to use this analysis to make better business decisions.

Modern FOPM hence puts a strong focus on large-scale financial analytics, where data is analyzed
o in a *self-service fashion* (not requiring IT to write-reports, but empowering business subject matter experts (SMEs) to conduct their own analysis),
o in *(near) real-time* where needed,
o leveraging *very high data volumes and data granularity* where needed (say customer profitability, marketing and sales analysis),
o yet in a *holistic* context,
   o considering related upstream and downstream business processes and functions (sales, marketing, risk, treasury, regulatory frameworks, …), and
   o leveraging hybrid-cloud integration to apply predictive analysis and other cognitive computing methods to unlock further value previously hidden in the data.

It should be noted that modern FOPM does *not* neglect traditional budgeting, forecasting, and Planning. To the contrary: Modern FOPM *will* result in much improved and streamlined forecasting and planning processes due to the better understanding of a company's business environment, its customers, products, organizational structures and their impacts. Modern FOPM does not focus on forecasting and planning, it focuses on deep analysis of available data – using online analytical processing (OLAP) and cognitive computing technologies – to establish insight into behavioral and procedural relationships. This insight is then used adjust business processes and activity and thereby leads to better (and more reliable) business outcomes.

By making the IBM Planning Analytics platform the centerpiece of their user-facing financial analytics strategy, and the end-user hub for financial analytics, leading companies have established a performance management solutions infrastructure that empowers business users in linking finance and operations to gain actionable insight for improving business performance, executing on strategy and adapting to risk.
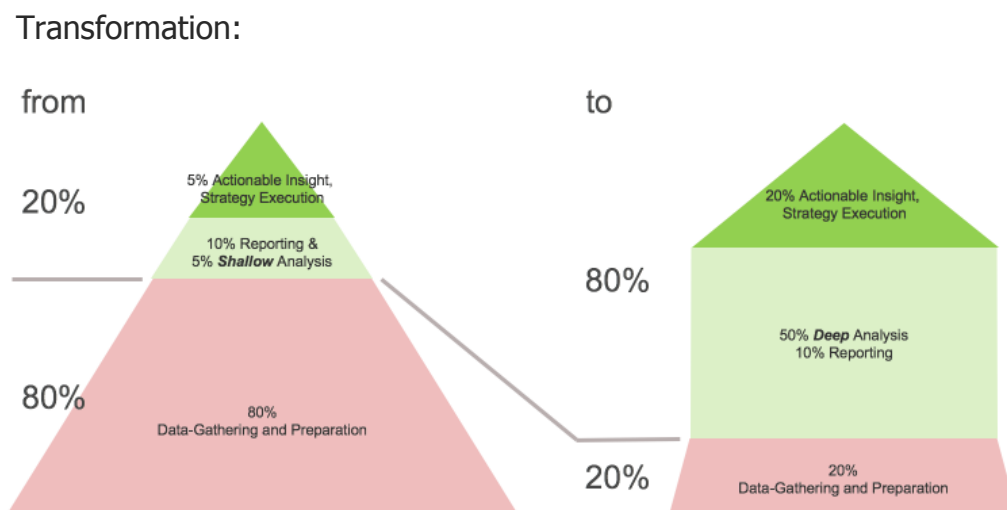
Transformation:

2   IBM Planning Analytics: What is it?

IBM Planning Analytics is a solution platform for financial analytics and financial performance management in the cognitive era, transforming the organizations across the offices of the CFO, COO, and beyond.

Planning Analytics
- Covers the entire planning and analysis cycle while providing deeper insights than traditional FP&A tools, from planning to reporting, scorecarding, deep financial analysis and forecasting.
- Can handle *billions* of records, effectively allowing operational financial analytics at the transactional / activity level
- Contains the most comprehensive & capable financial rules engine in the market space
- Is 100% cloud and hybrid-cloud compatible
- Handles volatility (changing fact-, master- & meta-data) better & faster than any other OLAP platform

3   IBM Planning Analytics: The Game Changer in Financial Analytics

3.1   What demands does Finance Transformation place on Financial Analytics Software Infrastructure Transformation, and how does IBM Planning Analytics Meet them?

Finance Transformation aims at a financial analytics solutions infrastructure that unlocks significant value across the offices of the CFO, COO, and beyond, by allowing users to easily and readily analyze and manage financially relevant operations and activities
- in a *self-service* fashion,
- in (near) *real-time* where needed, leveraging *very high data volumes* and *data granularity* where needed,
- considering related upstream and downstream business processes and functions (Sales, Marketing, Risk, Treasury, Regulatory Frameworks, …),
- and integrating Hybrid-Cloud infrastructure to apply predictive analytics and other cognitive computing methods to unlock further value previously hidden in the data.

The need for ***self-service* analysis** demands from Financial Analytics Software Infrastructure Transformation that:
- The data tier needs to be accessible via an **easily understandable semantic layer**, even by non-technical users. In other words: the semantic layer maps a technical and often complex data model to familiar business terms and business 'dimensions' such as Accounts, Products, Customers, Locations, Regions, Time, Currency, etc.
  - ⇨ **IBM Planning Analytics**, by virtue of being an **OLAP** solution platform, provides non-technical end-users with an easily understandable, semantic data layer based on cubes, dimensions, and hierarchies
- For analysis and reporting, the semantic layer should be exposed via **Web <u>and</u> Excel user interfaces** (UI). Web UIs provide convenient, platform-independent access and have a low infrastructure footprint. Excel UIs provide the most convenient access to financial analysts in that Excel is and will stay their most important and pervasive day-to-day tool.
  - ⇨ IBM **Planning Analytics Workspace (PAW)** is a latest generation web-user-interface for self-serve TM1 data analysis, contribution & collaboration. IBM **Planning Analytics for Excel (PAx)** features latest-generation Excel desktop analysis and contribution capabilities, against cloud- <u>and</u> on-premises data sources, and provides interoperability with PAW!

The need for ***real-time* analysis - against potentially very high data volumes –** demands **fast performance in a 'real-world' scenario**, meaning ever-changing fact-data, meta-data, master-data, and very high data volume shall not be a constraint.
- ⇨ IBM Planning Analytics easily meets these demands as it **calculates and aggregates 'on-demand'** and hence in 'real-time', it does not store 'null-values' (non-populated cells), and it employs **parallel processing capabilities** to maximize use of available hardware resources. This means that queries against billions of new records can be resolved in seconds!

Last, but not least, the need to consider related upstream and downstream business processes and functions, all while integrating with hybrid-cloud solution infrastructures to apply predictive analytics and other cognitive computing methods, demands a **scalable, flexible, hybrid-cloud compatible architecture**.
- ⇨ IBM Planning Analytics easily meets these demands as it employs a multi-cube architecture and shared-dimension model, meaning it can naturally grow and mature with your business and processes, it is available as both a cloud and on-premises solution, and it integrates with best-in-class cognitive computing solutions and analytics platforms, such as Cognos Analytics, SPSS, Watson Analytics, iLog and many others.

3.2 Details on how IBM Planning Analytics meets the demands of modern Financial Analytics Software Infrastructure Transformation

A. By virtue of being an **OLAP** solution platform, IBM Planning Analytics provides non-technical end-users with an **easily understandable, semantic data layer** based on cubes, dimensions and hierarchies

B. **Self-Serve Analytics** provides maximum end-user adoption, empowerment, and productivity (no need for IT to conduct analysis, write reports). Here's how:

i. IBM **Planning Analytics Workspace (PAW)** is a latest generation web-user-interface for self-serve TM1 data analysis, contribution, and collaboration.
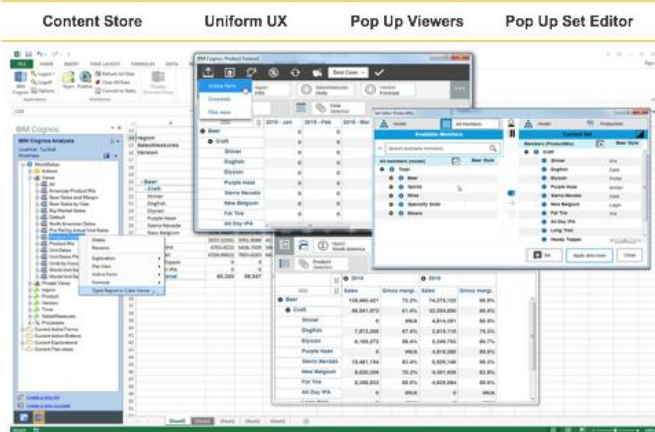

ii. IBM **Planning Analytics for Excel (PAx)** features latest-generation Excel desktop analysis and contribution capabilities, against cloud- and on-premises data sources, and provides interoperability with PAW[1]

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[1] A PAX worksheet can be viewed as a PAW object and vice versa, allowing easy switching between an Excel-based analysis and a web-based analysis in PAW.

iii. IBM Planning Analytics integrates with **Cognos Analytics (CA)** to provide modern, self-service Business Intelligence

C. IBM Planning Analytics can handle **very large data volumes (well into billions of records),** hence providing the ability for conducting large-scale 'big-data' Financial Analytics. Here's how:

IBM Planning Analytics does **not store 'null-values'** (non-populated cells).[2] Data-Sparsity therefore is not an issue for IBM Planning Analytics. Customers have deployed cubes with dimensions containing millions of dimension members/elements, trillions of possible intersections, and with billions or populated leaf cells!

D. IBM Planning Analytics supports **near Real-Time Analysis against very large and volatile data volumes**, allowing for analysis against transactional data and other highly granular data (client-level data for example), including what-if analysis and simulation. Here is how:

i. IBM Planning Analytics **calculates and aggregates 'on-demand' and in 'real-time'**. That means, Aggregations, consolidations, calculations, user inputs & contributions are not processed during data load or update, but on demand: On updating (or writing data) to a cube, only the leaf data is processed into (committed to) the cube. No calculations are occurring. Data Load/Update speed therefore is extremely fast. And, because aggregations etc. are only processed on demand, alternate rollups, hierarchies (such as different organizational structures, different account rollups, what-if analysis structures to analyze restructuring changes, …) do not come with a performance penalty. One can leverage as many alternate hierarchies/rollups as needed without having to worry about adverse performance impacts.

ii. IBM Planning Analytics' provides the ability for '**parallel-data-load**', using multiple CPUs to update a cube in parallel (resulting in a corresponding linear improvement in update speed). By employing parallel data load, IBM Planning Analytics can update more than 50,000 records per second per CPU core. Using 16 cores, this equates to 48 million records per minute or 2.88 billion records per hour!

E. IBM Planning Analytics provides **exceptional query performance: even for very large cubes with billions of populated records, calculations and consolidations occur in seconds**, not minutes. IBM Planning Analytics' sparse consolidation and calculation algorithms are ultra-fast and

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[2] One can tell IBM Planning Analytics to store 0's explicitly (you would do so in cases where a 0 value is to be distinguished from a null-value). By default, IBM Planning Analytics will not store 0's nor null-values.

support **parallel query processing via Multi-Threaded-Queries** (MTQ). By employing a 'give and take' approach to assigning and re-assigning processing units between user queries, IBM Planning Analytics will continuously balance and re-balance CPU utilization between threads requesting and using MTQ. Depending on actual CPU utilization at query runtime, multiple-to-many processors may be engaged in resolving an end-user query. This results in ultra-fast calculation speed.

F. IBM Planning Analytics can **perform the most complex financial calculations, resulting in one analytic platform for all analysis needs**, 'simple' OLAP (aggregations) to financial modeling to operational actuarial modeling and analysis to profitability modeling to risk modeling & analysis.

The IBM Planning Analytics **rules engine** is the most powerful and comprehensive OLAP business rules engine available in the market, with the ability to

   i. Calculate numerical and textual outcomes,
  ii. in real-time,
 iii. while leveraging
   • mathematical and financial operations and functions,
   • against leaf values, aggregations and arrays in the same or in other (multiple) cubes,
   • dynamically and logically derived query parameters,
   • with Boolean Logic against numerical and/or textual (string) values and master/meta-data properties

G. The IBM Planning Analytics **Solution Infrastructure can 'grow' with a company's business, involving different and changing business processes, on demand and as needed**. This is because IBM Planning Analytics employs a true **multi-cube architecture** and **shared-dimension model.**

H. IBM Planning Analytics provides **ongoing and significant cost-savings for cloud-transitioning strategies**: With IBM Planning Analytics, customers can embark on a step-by-step and 'as-applicable' migration path to cloud. On-Premises applications can be cloud-deployed within days and interoperate (exchange data) with other cloud applications and with other on-premises applications over secure communication channels & without requiring additional infrastructure investment for data-integration[3]. Any IBM Planning Analytics model – on cloud or on premises - integrates with other IBM Planning Analytics Cloud or On-Premises instances.

I. IBM Planning Analytics integrates with best-in-class cognitive computing solutions and analytics platforms, such as Cognos Analytics, SPSS, Watson Analytics, iLog, and others. This provides the ability to **analyze data for causal relationships and insight previously hidden from sight**, resulting in deeper business insight & improved decision making.

J. IBM Planning Analytics provides an OData-based RestAPI as a means for open (non-proprietary), built-in (meta)data discovery & management. The **TM1 Rest API** can be leveraged to retrieve as well as manage the TM1 Data Dictionary, TM1 content and metadata and represent it in a non-proprietary format. The TM1 Rest API can also be used to execute/perform virtually any TM1 functionality. It is the interface used by all 'newer' TM1 UIs (PAX, PAW) when communicating/interacting with TM1.

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[3] The IBM Planning Analytics Suite contains the data-integration and management tools Cognos Integration Server and Cognos Command Center. **Cognos Command Center** provides a solution for streamlining and orchestrating recurring maintenance and administration tasks around Master-, Meta- & Fact-Data Management for TM1. **Cognos Integration Server** provides data integration into TM1 and RDBMS, between TM1 instances and from Oracle Hyperion Essbase & HFM into TM1. Cognos Command Center and Cognos Integration Server leverage **cloud-compatible data integration technology** for Process Automation/Management and Data Integration in a Hybrid-Cloud environment (cloud to cloud, on-premises to on-premises, on-premises to cloud, cloud to on-premises)