Oracle In-Memory Policy Analytics on Oracle Engineered Systems

*Predict the Impact of Policy Change*
Disclaimer

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Executive Summary

In an ever changing world, government and private enterprise are increasingly required by law to predict the impact of legislative and policy change and respond to citizen needs. The complexity of policy and legislation combined with the scale of organizational data make it practically impossible for organizations to meaningfully assess the impact of policy on actual customer scenarios.

Now, for the first time, Oracle In-Memory Policy Analytics empowers policy owners to quickly assess the impact of existing and proposed policy using real business rules and real business data.

Introduction

Rocked by the global financial and economic crisis, on 22 March 2012, the Council of the OECD recommended all member states (including US, UK, Canada) evaluate whether policy options are effective and efficient in achieving goals and actively assess and evaluate the impact of proposed regulatory change. Similar provisions now operate in domestic US, European and APAC economies.

Government bodies are under increasing pressure to conform to this weight of government regulation while delivering efficient and customer-centric service.

Today’s consumer is well-informed and well-connected. Citizens who are dissatisfied with a policy and customers who are dissatisfied with a product can quickly and easily take their business elsewhere or make their grievance heard in a digital landscape.

Aggregated data is simply not sufficient to analyze the impact of policy change on an individual. The elderly pensioner who cannot get health cover, the veteran whose medical claim is rejected are the ones that make the news. Society cares about the individual and the effect of policy change on individuals.
The Opportunity: Real-time Policy Comparisons

Many large public and private sector organizations have already discovered the power of Oracle Policy Automation to efficiently incorporate policies into mission critical processes to deliver accurate, consistent and auditable outcomes across any customer circumstance. The policies being automated may need to match particular legislation or regulations, or simply need to reflect the latest internal company policies. For example, the policies may be designed to calculate payment amounts, make decisions on eligibility, or calculate risk ratings.

![The source legislation or policy](image)

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![Executable document in natural language that business users can understand and modify](image)

Figure 1: Data maps to specific legislative provisions, allowing very rapid policy updates and prototyping, and supporting rich and detailed what-if analysis of alternative policy formulations.

Applying these finely modeled policies to large volumes of data in near real-time allows rapid iteration on the implications of different policy scenarios. Information both at a case-by-case level and in dashboard view allows demographic analysis and understanding of key constituencies to be undertaken at any level of detail.
Introducing Oracle In-Memory Policy Analytics

Oracle In-Memory Policy Analytics allows business to assess the impact of policy change against real customer data on a scale never seen before.

Under Oracle’s “Engineered to Work Together” strategy, Oracle In-Memory Policy Analytics combines best-of-breed hardware and software components with game-changing technical innovation.

The solution comprises:

- **Oracle Exalytics In-Memory Machine**: the world’s first engineered system specifically designed to deliver high performance analysis, modeling and planning.

- **Oracle TimesTen In-Memory Database For Exalytics**: an industry-proven memory-optimized relational database, TimesTen stores all its data in memory optimized data structures and supports query algorithms specifically designed for in-memory processing at lightning speed.

- **Oracle Policy Automation**: built on more than 20 years of experience in modeling and applying policies efficiently to individual circumstances, only OPA is designed for modeling complex policies in natural language to match statutes, regulations and policy manuals, ensuring outcomes are both customer-centric and accurate.

Engineered for Excellence

By leveraging the unique capabilities of Oracle TimesTen In-Memory Database for Exalytics, Oracle In-Memory Policy Analytics is designed to provide exceptional performance. Hybrid columnar compression ensures as much business data as possible is available in-memory, and that the data is retrieved quickly. While the built-in on-line analytical processing operators allow policy experts to quickly pivot through the data across policy scenarios, comparing the impact on citizens and customers across geography, time or any other dimension.

Also available for Spare Supercluster, Oracle In-Memory Policy Analytics can take advantage of the huge memory and fast data access of these powerful engineered systems that allow many workloads to be easily consolidated onto a single powerful hardware platform.

Leveraging Existing Business Assets

Oracle In-Memory Policy Analytics empowers policy experts to maximize the potential of existing business assets. Data can be drawn from an organization’s own existing data sources such as Siebel, RightNow or an existing data warehouse, harnessing real-world data that may have been previously inaccessible to business. Policy models are created from the organization’s current or proposed policy or legislation by policy experts themselves. With this unique combination, only Oracle In-Memory Policy Analytics empowers policy experts to rapidly run citizen data against multiple policy versions, visualizing the results directly against the organization’s own customer base and own source material.

Example Applications

Immediate impact can be found in:
• **Social Security:** Identifying the ‘winners’ and ‘losers’ in a proposed policy change. Identifying where improper payments have been made.

• **Tax:** Costing policy change, identifying unusual outcomes and assessing the efficacy of targeted tax incentives.

• **Financial Services:** Identifying where a policy change may result in fewer customer loan defaults or higher customer retention.

• **Higher Education:** Identifying where changes to course structures, sponsorship and grant arrangements may impact the existing student population or attract new students.

• **Health:** Assessing how change to fee and incentive structures may impact the provision of high demand services.

Harvesting the Power of Oracle In-Memory Policy Analytics

Complying with government regulation and achieving best of class customer service requires not only understanding the potential for policy to achieve change, but also to understanding how existing policies are operating in practice. Oracle In-Memory Policy Analytics provides a complete lifecycle view of policy application and continual improvement.

**Objective: Cost and Compare Policy Options**

Writing and evaluating different policy options is difficult enough without grappling with the uncertainty of how the policy will be applied in a real-world setting. Oracle In-Memory Policy Analytics takes the guesswork out of the equation by running proposed policy against existing real-world data, allowing business to:

• Estimate approximate cost of proposed policies using a known customer base

• Assess the impact of proposed policy change against an existing policy baseline

• Identify ‘winners’ and ‘losers’ for each policy proposal

• Experiment with ‘what if’ scenarios

• Produce reports needed for regulatory compliance
Objective: Evaluate Policy Efficacy

Oracle In-Memory Policy Analytics allows business to understand how policies currently operate, an essential first-step to optimizing policy and improving business outcomes. With Oracle In-Memory Policy Analytics, business can:

- Identify the most common scenarios and key customer base
- Identify outlying cases and unusual outcomes, such as improper payments
- Identify redundancy and under-use of existing policy
- Identify where applying the same policy through different channels results in inconsistent outcomes.

Figure 2: Oracle In-Memory Policy Analytics allows for the rapid comparison of policy options, identifying the effect on individuals or key interest groups.
Objective: Achieve Better Policy Outcomes

With an accurate view of existing policy operation base on real-world data, business is able to act on improving and responding to areas most in need. This immediately enables a business to:

- Identify high and low traffic areas to focus policy improvement
- Rewrite policy in key areas first
- Target review of unusual payments
- Focus staff training to areas most in need.
Oracle In-Memory Policy Analytics allows business to immediately see how existing policy is applied in practice, highlighting areas in highest demand.

Objective: Adapt and Innovate

Oracle Exalytics’s unmatched speed and scalability combined with Oracle Policy Automation’s adaptability and responsiveness to policy change, delivers a solution engineered to support change and innovation. The results produced by Oracle In-Memory Policy Analytics are created in lightning speed so policies are easily adapted and re-run, allowing business to experiment with policy alternatives in ways that could never be achieved through traditional policy evaluation techniques.

It is with this complete and up-to-date view of current and proposed policy impact, that Oracle In-Memory Policy Analytics enables business to achieve full operational potential, comply with government regulation and deliver on outstanding individual customer service.

About Oracle Engineered Systems

Exalytics

Exalytics is an engineered system built for in-memory analytics. Exalytics In-Memory technology allows for terabytes of data to be stored directly in-memory for fast analysis and calculations, resulting in speed of thought responsive analytic performance and visual analysis with no limits. It consists of a combination of a powerful hardware platform, Oracle Analytics products spanning Relational, Multidimensional, Unstructured and Predictive Analytics. These products including Oracle Business Intelligence Foundation Suite, TimesTen In-Memory Database for Exalytics, In-Memory Essbase and In-Memory Endeca have been enhanced to run faster, more effectively and more efficiently upon the Exalytics platform.

What is unique about Exalytics?

Exalytics is custom designed for In-memory Analytics. It packs a Terabyte of high speed memory and matches the memory backed by 2.4TB of high-speed PCI-Flash that can support hundreds of thousands of IOPS per second as well as gigabytes of bandwidth per second. This flash layer is further backed by 3.6 TBs of hard disk storage. Exalytics also includes FibreChannel interfaces to further expand storage capacity.

In addition to memory and storage, Exalytics includes the top of the line Intel Xeon processor with 40 compute cores with hyper-threading to provide 80 threads of computation. Exalytics also provides numerous high speed networking options including 10Gbps and 1Gbps Ethernet. However specifically for Exadata connectivity, Exalytics also includes two 40Gbps InfiniBand interfaces and cables to ensure unparalleled latency and throughput between Exalytics and Exadata.

Hardware and Software Engineered to Work Together

Exalytics software components have been optimized tightly to match the hardware – all the way to specific hardware parts, their firmware, drivers and the operating system – a customized Oracle
Enterprise Linux release with Unbreakable Enterprise Kernel. These low level optimizations have shown 3X better scalability and performance on benchmarks compared to similarly configured commodity servers. Some of the notable features that are available only on Exalytics are – columnar compression and OBIEE specific analytic functions for TimesTen, aggressive memory and concurrency optimizations in Essbase and OBIEE. These functions enable Exalytics to store more data, process queries faster, load and export data faster, and handle more users and concurrent workloads than identically configured commodity servers running commodity operating systems.

Apart from performance, the unified lifecycle experience – from install, administration, and patching are optimized throughout the stack to provide the lowest total cost of ownership for deploying analytic applications – that cannot be achieved by building the entire solution stack piecemeal from multiple vendors.

By leveraging this powerful and unique combination of software and hardware, Oracle In-Memory Policy Analytics delivers breakthrough analytical capabilities.

**SPARC SuperCluster**

Oracle’s SPARC SuperCluster is the world’s most efficient multi-purpose engineered system, delivering extreme efficiency, cost savings, and performance for consolidating mission critical applications and rapidly deploying cloud services. Oracle’s SPARC SuperCluster represents a complete, pre-engineered, and pre-tested high-performance enterprise infrastructure solution that is faster and easier to deploy than a collection of individual database and application servers. The system combines innovative Oracle technology—the computing power of Oracle’s SPARC servers, the performance and scalability of Oracle Solaris, the Sun ZFS Storage Appliance, the optimized database performance of Oracle Database accelerated by Oracle Exadata Storage Servers, and a high-bandwidth, low-latency InfiniBand network fabric—into a scalable, engineered system that is optimized and tuned for consolidating mission-critical enterprise applications.

Oracle’s SPARC SuperCluster provides both the capacity for growth, as well as the fine-grained server virtualization needed to isolate individual application components. With multiple layers of enterprise application infrastructure consolidated onto a high-performance, highly available SPARC SuperCluster system, deployment speed, application performance, and availability can all be optimized. Designed as a pre-configured, pre-tested, and ready-to-deploy SPARC SuperCluster engineered system, the solution provides a complete and optimized infrastructure solution for applications, built around robust compute, networking, storage, virtualization, and management resources. The result is a system that is orders of magnitude easier to manage, and up to five times faster to deploy than alternatives, all while occupying considerably less real estate requiring less power. Furthermore, the SPARC SuperCluster system provides full built-in redundancy resulting in a highly reliable infrastructure without single point of failure. An issue with one component will not impact other components of the system offering true isolation. Customers can consolidate multiple environments with minimum disruption, without fear of performance degradation, and the ability to achieve required service levels.
Conclusion

Oracle believes that government and business should be able to leverage their existing data sets to make accurate assessments of the impact of policy change. Government and business need assurance that their policies are continuing to operate as intended and with optimal results.

Policy change cannot be assessed without a baseline. Oracle In-Memory Policy Analytics allows business to both assess outcomes under existing policy and compare these to the impact of proposed policy change.

Oracle In-Memory Policy Analytics on Oracle Engineered Systems allows organizations to predict, for the first time, the impact of policy by applying real-world rules to real-world data, and at incredible speed.

For more information on Oracle In-Memory Analytics, please visit oracle.com, contact us by e-mail at @oracle.com or call 1.800.735.6620 to speak to an Oracle representative.