HOAP and in-memory computing: accelerating digital business and customer experiences

The 451 Take

451 Research has observed that the majority of companies are increasing their investment in data processing, analytics and machine learning software with a desire to become more data-driven. One of the driving forces of this shift is the need to deliver improved, real-time customer experience via systems of engagement.

Catering to users' preferred ways of consuming information and engaging with brands is becoming an increasingly critical part of a business' strategic value proposition and competitive differentiation. In-memory computing provides the speed and responsiveness required to deliver these real-time systems.

For example, retail engagement in a bricks-and-mortar environment has traditionally been person-to-person: help, advice, suggestions and recommendations were provided and questions were answered by employees. Only after the transaction was completed and the related data entered into the system of record (financial/ERP, CRM applications) was it made available for analysis.

Today, software is not only being used to execute transactions in online retail environments, but it is also replacing the role played by employees. Chatbots and digital assistants may answer questions and make suggestions while potential purchases and personalized offers may be recommended based on previous transactions.

These new systems of engagement – the application, the digital assistants and chatbots – are enabled by underlying systems of intelligence (rules engines, decisioning systems, recommendation engines, natural language processing, image recognition and other forms of artificial intelligence) that provide real-time analytic processing on operational data to automate data-driven decisions at the speed of business. Delivering those systems of engagement and intelligence requires hybrid operational and analytical data processing products designed to take advantage of the improved performance enabled by hardware, memory and processor functionality to operate in real time.

Data from 451 Research's Total Data Market Monitor shows that hybrid operational and analytic processing (HOAP) workloads are growing. HOAP workloads accounted for 5.7% of new database revenue in 2017, compared to 63.6% for OLTP workloads, and 30.7% for OLAP workloads. By 2022, however, we estimate that HOAP workloads will account for 26.9% of incremental database revenue, compared to 42.3% for OLTP workloads and 30.9% for OLAP workloads.

Estimated Incremental Database Revenue, 2022
Source: 451 Research Total Data: Data Platforms & Analytics Market Monitor
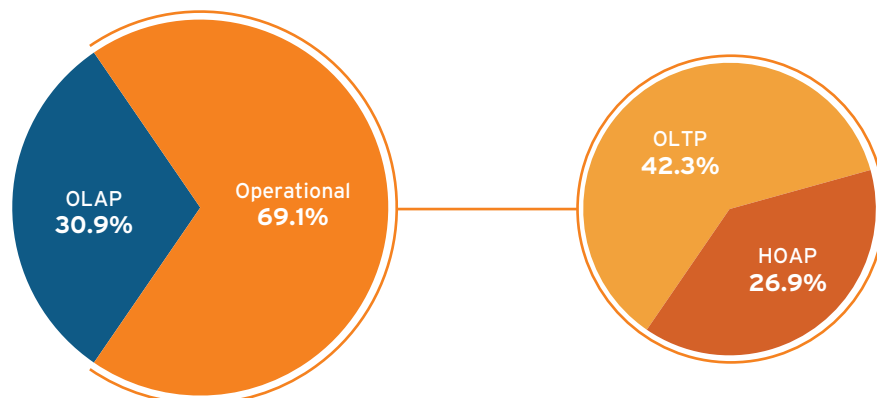
OLAP 30.9% | Operational 69.1% | OLTP 42.3% | HOAP 26.9%

Business Impact

REAL TIME. Offering contextual experiences requires applications that can deliver real-time responses. Consumers and employees alike expect immediate information and content from modern applications, driving the need for real-time data processing.

RESPONSIVE. The rapid processing and delivery of static information and content isn't enough to fulfill the requirements for engagement. Information/content needs to be related to the specific individual and the nature of the interaction.

AGILE. The delivery of information and content also needs to be contextual, which means that it will change depending on the channel, device, delivery model and specific nature of the interaction.

PERFORMANT. Supporting the real-time delivery of contextual data and content relies on simultaneous operational and analytic processing during the period of engagement, which relies on high-performance in-memory data processing.

SIMPLE. Delivering hybrid operational and analytic processing in a performant manner relies on products and services that have been specifically designed to eliminate the complexity of delivering multi-functional capabilities.

COST-EFFECTIVE. Providing simultaneous operational and analytic processing has the potential to lower data processing and overall infrastructure costs by reducing the need for extracting, transforming and loading data between separate data processing environments.

Looking Ahead

Data – and the real-time processing of data – is a key driver that can enable companies to grasp the opportunities presented by digital transformation. This can allow them to deliver the next generation of interactive applications with a view to gaining competitive advantage.

The adoption of hybrid operational and analytic processing databases is in its infancy. However, hybrid operational and analytic processing database workloads are set to grow significantly for new database deployments, driven by the delivery of automated systems of engagement and the underlying systems of intelligence, in part to support improved customer engagement.

There will remain a requirement for traditional analytic data processing to support data warehousing and business intelligence workloads based on historical data. However, 451 Research believes that an increasing proportion of enterprise operational applications will rely on hybrid operational and analytic processing to support use cases such as recommendations, personalized content and offers, and real-time fraud analysis.

The availability of high-performance in-memory computing technology, therefore, lays the foundation for the development of applications designed to deliver this functionality. As these applications become mainstream, internal employees and external customers alike will expect the real-time delivery of contextual content and information via systems of engagement. As such, the adoption of hybrid operational and analytic processing can be expected to snowball to become the default option for new enterprise applications.

GridGain

The GridGain in-memory computing platform provides the real-time performance needed to power HOAP solutions. Companies use GridGain to enable their digital transformation initiatives and build omnichannel customer engagement solutions across industries including financial services, online business services, fintech, IoT, travel, telecom, software, healthcare, government and more. To learn how GridGain solutions can help your company succeed, please email us at info@gridgain.com or call us at (650) 241-2281 or +44 (0)7775 835 770 now.