



REAL-TIME DATA MARTS: A STUDY OF MORTGAGE INDUSTRY GAME-  
CHANGER

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*Abstract*

*The mortgage sector is under a profound disruption thanks to technological innovations in data and analytics. The advent of real-time data marts has become a game-changing innovation that will help mortgage lenders make smarter, faster decisions, create better customer experiences and increase efficiency. In this article, we discuss the premise of real-time data marts, their use in the mortgage industry, and the advantages and disadvantages of using them.*

*Keywords: Data marts, Mortgage Industry, Data Analytics, Business decision, Customer Experience, Business efficiencies.*

**I. INTRODUCTION**

The mortgage industry is a complex and tightly controlled space where tons of data are generated and analysed every day. Every element of the mortgage lifecycle, from origination to underwriting to servicing and risk management, is dependent on data. Given the size and importance of this data, proper data collection and analysis are essential for the success and productivity of mortgage lenders. Traditionally, the mortgage business has operated on batch-based, isolated databases. These systems read information in huge, irregular batches, which cause time delays and inefficiencies. This delay can slow decisions and adversely affect customer experiences in an extremely competitive market. The demand for real-time access to data has become clearer as lenders compete to meet the evolving expectations of today's mortgage market.

Live data marts have proven to be the world's newest breakthrough solution to this problem. These systems provide real-time access to the latest information, helping mortgage brokers make faster, more accurate decisions. By providing live information at a glance, live data marts help lenders adjust rapidly to market changes, optimize workflows, and improve customer experience. Real-time data marts aren't just for decision-making. They also help streamline processes and enhance overall productivity. Direct access to real-time data enables mortgage providers to cut processing time, eliminate errors, and more efficiently allocate resources. That makes the company more flexible and responsive, enabling it to provide better customer service and navigate the mortgage industry.



This study investigates real-time data marts' architecture, functionality, and basic components. We review how these systems are used in the mortgage space, highlighting their use at various points in the mortgage lifecycle. We also touch on the benefits and disadvantages of real-time data marts, providing a balanced view of their impact and drawbacks.

## II. PRINCIPLES OF REAL-TIME DATA MARTS

### A. Definition and Features:

Real-time data marts are high-tech data warehouses that can instantly deliver data to be analyzed and reported on. In contrast to regular data marts, which use batch updates, real-time data marts aggregate and update the data from multiple sources continuously, which guarantees that the most current information is always accessible. Some of the key features of real-time data marts are:

1. **Low Latency:** Data is received, processed, and accessible for analysis with minimal delay – sometimes in real-time.
2. **Scalability:** The architecture can handle massive amounts of data and scales horizontally to handle the increase in data.
3. **Dynamic:** Real-time data marts can include information from transactional databases, data warehouses, and external data feeds.
4. **Accessibility:** Data is accessible to everyone in the organization with easy-to-use query and reporting tools.

### B. System Architecture and Features:

The architecture of real-time data marts usually includes the following elements:

1. **Data Sources:** These are transactional databases, data warehouses, CRM's and external data feeds – raw data to be ingested.
2. **Data Ingestion Layer:** This layer captures and streaming data from different sources at the same time. Data Ingestion is mostly implemented with technologies like Apache Kafka, Amazon Kinesis and Apache Flink.
3. **Data Processing Layer:** This layer transforms the input data, enriching it for analysis. To transform data in real time, Stream processing models such as Apache Flink, Apache Storm and Amazon Kinesis Data Analytics are implemented.
4. **Data Store Layer:** This layer stores the processed data in query and report-optimized format. Real-time data is typically stored using NoSQL databases like Amazon DynamoDB and Apache Cassandra.
5. **Data Access Layer:** Data access layer gives access to real time data through query and report tools. Applications such as Apache Superset, Tableau, Power BI let you run ad-hoc queries and generate real-time reports.



### III. IMPLEMENTATION IN THE MORTGAGE INDUSTRY

#### A. Loan Creation and Pre-qualification:

A real-time data mart can significantly accelerate the creation and qualification of loans by giving instant access to applicants, credit score, property details and market information. Lenders could benefit from real-time analytics to see if an applicant's credit is reliable, what are the risks, and approve faster. Integrating information across credit bureaus, property databases, and CRM platforms, real-time data marts allow for a single view of every loan request.

#### B. Loan Servicing:

In this case, loan servicing would include keeping track of ongoing loan payments, escrow accounts, and customer calls. These can be automated with real-time data marts that display the latest payment history, balance, and customer interactions. Servicers can access live dashboards to track payment performance, detect delinquent accounts, and automatically resolve customer problems. This results in higher customer satisfaction and more effective management of loans.

#### C. Risk Management:

Risk management is one of the most important components of mortgage activities, and this includes recognition, assessment, and reduction of financial risks. With real-time data marts, mortgage brokers can constantly track risk factors including interest rate, credit histories, and economic activity. Lenders can also take advantage of real-time analytics to detect risks in the market, run stress tests and adjust risk controls accordingly. This proactive effort helps to keep the lending company in a healthy cash flow position.

#### D. Customer Experience:

With the mortgage industry getting increasingly crowded, it's critical to provide high-quality customer experience to gain and keep borrowers. Data marts allow lenders to make personalized and immediate connections with customers. Lenders can also use real-time customer data based on their preferences, behaviours, and feedback to personalize their messaging and provide specific loan products that suit the individual borrower. This personalized approach increases customer satisfaction and thereby boosts business.

#### E. Compliance and Reporting:

Being compliant with regulation is one of the main priorities of a mortgage lender. The real-time data marts allow you to report accurately and on time by displaying real-time data on loan pools, transactions, and compliance. Mortgage borrowers have the ability to track regulations in real time, create regulatory reports, and follow industry standards. This minimizes the likelihood of compliance failure and penalties.

### IV. BENEFITS OF REAL-TIME DATA MARTS

#### A. Better Decisions:

Real-time data marts help mortgage lenders take better and faster decisions based on immediate access to the latest data. This accelerates important functions like loan approvals, risk



evaluation, and customer service interactions which improve operational efficiency and customer satisfaction.

**B. Improved Customer Experience:**

Mortgage lenders can make personalized and prompt interactions with customers using real-time data. The result is better customer insight, superior customer service, and more loyal customers.

**C. Greater Operational Efficiency:**

Data marts simplify mortgage operations, providing real-time information across all functions, including origination, underwriting, and servicing. This frees up time, reduces errors, and maximizes productivity.

**D. Preventive Risk Management:**

Real-time monitoring of risk indicators with the help of data marts will enable mortgage lenders to anticipate and reduce risks. This provides financial security and minimizes the chance of losses.

**E. Compliance with the Regulations:**

Real-time data marts enable accurate and timely reporting in order to meet the regulatory standards. This reduces the risk of default and penalties and improves the creditor's credibility.

**V. CHALLENGES AND CONSIDERATIONS**

**A. Data Mapping:**

It's sometimes hard to integrate data from multiple sources in a live data mart because of differences in formats, structures, and quality. Data integration processes and standards must be developed in such a way that data being ingested is accurate and consistent.

**B. Data Quality:**

Having the best quality data is important to make real-time data marts efficient. Data errors, inconsistencies, and duplicates can cause incorrect analysis and decisions. Data Quality management tools (data validation, cleansing, enrichment, etc) must be followed in order to keep the data clean.

**C. Scalability:**

As mortgage activity expands, the number of records handled by real-time data marts can skyrocket. Scalability of the ingestion, processing, and storage layer is important for meeting increased data demands. This could mean using cloud and scalable technology to handle large volumes of data.



**D. Data Security and Privacy:**

The mortgage industry uses sensitive customer data, which is why data security and privacy are crucial. Data marts in real time need to ensure that data is secure through encryption, authorization and monitoring. Data protection laws, including General Data Protection Regulation (GDPR) and California Consumer Privacy Act (CCPA), are likewise must-follows.

**E. Price & Resources:**

Having and deploying real-time data marts can be very expensive and time consuming. It's important for mortgage lenders to take a careful look at all the associated costs - in terms of infrastructure, software, and people - and find a cost-effective approach to deploy real-time data marts. These can include using cloud services and managed services to leverage resources and lower operating costs.

**VI. CASE STUDIES**

**A. Mortgage Lender:**

A Mortgage Lender has deployed a live data mart for loan origination to streamline the workflow. By bringing together credit bureau, property, and CRM information, the lender could determine an applicant's creditworthiness with greater precision and approve more quickly. The live data mart also gave insights into market conditions, and the customer wants so that the bank could offer customized loan products. The result was a 20 percent increase in loan approval rates and a 15 percent decrease in processing time for Mortgage Lender.

**B. Financial Services:**

A leading Financial Services company utilized real-time data marts to enhance risk management and compliance. By monitoring the risk indicators and compliance metrics constantly, the lender was able to spot emerging risks and ensure compliance with regulatory requirements. The real-time data mart also helped the lender run stress tests and optimize risk management in advance. This caused delinquent accounts to fall by 10% and regulatory penalties to fall by 25%.

**C. Home Loans:**

A leading Home Loan company leveraged real-time data marts to improve their customer experience and business operations. Based on real-time data from customer conversations and comments, the lender could customize messaging and provide personalized loan products. The real-time data mart also sped up loan servicing by lowering manual work and increasing the speed of response. This led to Home Loans achieving 30% higher customer satisfaction and 20% higher operational efficiency.

**VII. FUTURE DIRECTIONS**

**A. Connectivity to Artificial Intelligence (AI) and Machine Learning (ML):**





AI and ML coupled with real-time data marts present significant opportunities for improving mortgage operations. AI and ML algorithms can also analyze data in real-time to detect trends, predict trends, and suggest recommendations. Predictive analytics, for instance, could predict borrower behaviour and thus allow lenders to take measures to mitigate risk and grow loan portfolios more effectively. Moreover, chatbots and virtual assistants powered by AI can make use of real-time data to deliver individualized customer support and enhance engagement.

**B. Blockchain Technology:**

Blockchain technology can further revolutionize real-time data marts by enabling a secure, open, and unalterable transaction record ledger. For the mortgage sector, blockchain can help keep data integrity intact, detect fraud, and simplify verification. By connecting blockchain with real-time data marts, mortgage companies can create a secure, efficient ecosystem for processing mortgages and complying with the law.

**C. Internet of Things (IoT):**

IoT can produce enormous amounts of data in real time from embedded systems. IoT devices for the mortgage market can offer insight into the state of the property, energy consumption, and occupancy. The data can be consumed and fed into real-time data marts in order to provide more accurate property valuations, better underwriting, and loan servicing. For instance, IoT-enabled smart meters can display energy use at any time, enabling lenders to estimate property value and borrower affordability.

**D. Improved Data Visualization:**

Improved data visualization can make real-time data marts more accessible by presenting rich data in convenient ways. Mortgage institutions can use visualizations to gain insight into key performance metrics and market trends and take data-driven decisions. An interactive dashboard can also be used for team collaboration to allow stakeholders to see and find information quickly.

**E. Edge Computing:**

Edge computing or storing data close to the source can support real-time data marts by decreasing latency and maximizing data processing capacity. Edge computing for the mortgage sector allows for real-time analytics at the premises – for example, for property inspections or instant loan approvals. By leveraging edge computing and real-time data marts, lenders can deliver faster, more responsive services to customers.

**F. Cloud Solutions:**

Cloud solutions provide the capacity, flexibility and affordability to implement and manage real-time data marts. With cloud computing, mortgage banks can process massive amounts of data, scale dynamically and save infrastructure costs. Cloud real-time data marts allow collaboration and remote access as well, so teams can collaborate from anywhere.



## VIII. CONCLUSION

- The real-time data mart is a revolutionary development for the mortgage industry, helping lenders to take faster, more informed decisions, improve customer experience, and streamline processes. In giving lenders instant access to current data, real-time data marts allow mortgage companies to adapt rapidly to market developments, mitigate risk, and provide customers with the personalized service they want.
- Among the various components of real-time data marts are data ingestion, processing, storage, and access layers. It requires mortgage lenders to think very hard about the integration of data, the quality, scalability, security, and cost management aspects before launching. In conjunction with cutting-edge AI, blockchain, IoT, edge computing, and cloud solutions, lenders can further expand the capabilities of real-time data marts and revolutionize the industry.
- In the changing landscape of the mortgage industry, real-time data marts will become more crucial to mortgage operations in the future. With this disruptive technology, mortgage lenders can position themselves in a competitive landscape, become more efficient, and deepen their relationships with customers. The road to real-time data mart revolutionizing the mortgage industry is rocky, but there's still plenty of cash in the bank for those willing to pioneer and evolve in this rapidly evolving space.

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