

Final report

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# Executive Summary

This Executive Summary provides a snapshot of the project's objectives, methodology, and anticipated outcomes, setting the stage for the detailed analysis and recommendations presented in the subsequent sections of this report. In this project, the Business Analyst team undertook the task of enhancing and modernizing the data management capabilities of BMO (Bank of Montreal) through the implementation of a cloud-based system. The primary aim was to improve data accessibility, security, and analytics capabilities across the organization, aligning with BMO's strategic goals for digital transformation.

Throughout the project, the team conducted thorough assessments of existing systems, evaluated various solution options, and developed comprehensive implementation strategies. The chosen solution involved transitioning BMO's current data management systems to a scalable cloud-based platform, incorporating state-of-the-art analytics and security protocols. Key components of the project included infrastructure upgrades, pilot deployment, training program development, phased roll-out, post-deployment support setup, and final system evaluation. Additionally, a robust testing strategy was devised to ensure the reliability and quality of the implemented solution.

The project's success is expected to significantly enhance BMO's data processing capabilities, facilitate data-driven decision-making, improve information security, and ultimately contribute to better customer service and a stronger competitive position in the market.

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# Risks Log

|  |  |  |  |
| --- | --- | --- | --- |
| *Risk* | *Severity/Impact* | *Probability* | *Mitigation* |
| Integration Complexity | High | Medium | Conduct thorough system integration testing and implement a phased integration approach. |
| Regulatory Compliance Changes | Medium | High | Establish a dedicated team to monitor regulatory changes and develop a flexible architecture for quick adaptation. |
| Data Security Breach | High | Low | Implement robust data encryption, access control measures, and conduct regular security audits. |
| Vendor Dependency | Medium | High | Establish clear contractual agreements with vendors, identify alternative vendors, and develop contingency plans. |
| Scope Creep | Medium | Medium | Define clear project scope, educate stakeholders about the impact of scope changes, and obtain formal approval for any changes. |
| Technology Obsolescence | Medium | Low | Conduct regular technology assessments and develop a technology roadmap for timely upgrades and replacements. |
| Stakeholder Resistance | Medium | Medium | Implement a comprehensive stakeholder engagement plan, address concerns, and involve stakeholders in decision-making processes. |
| Resource Constraints | High | Medium | Conduct thorough resource assessment, implement resource management tools, and track resource utilization to identify potential bottlenecks. |
| Business Process Disruption | High | Low | Develop a robust business continuity plan and conduct regular drills to test its effectiveness. |
| Change Management Resistance | Medium | Medium | Implement a comprehensive change management plan, engage stakeholders, and provide support throughout the change process. |

# ROI

**Assumptions for ROI Calculation:**

* **Annual Revenue Increase:** Due to stronger efficiency and customer reach, there's a predicted annual sales boom of $50,000 in Year 1, developing through $25,000 every year.
* **Savings from Efficiency:** Estimated at $20,000 yearly from reduced operational prices due to cloud efficiency.

**ROI Calculation:**

* **Total Costs (5 Years):** $270,000
* **Total Benefits (5 Years):** $600,000
* **ROI:** [(Total Benefits - Total Costs) / Total Costs] \* 100 = [(600,000 - 270,000) / 270,000] \* 100 = 122.22%

This simplified ROI analysis demonstrates a sizable return over five years, justifying the investment inside the cloud-primarily based data management gadget.

# Implementation/deployment Strategy/approach

**Implementation Overview**: The project aims to transition BMO's current data management systems to a more scalable, cloud-based platform, incorporating state of the newest and latest analytics and security protocols to support the bank's digital transformation goals.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Task | Task Description | Begin Date | End Date | Key Person(s) Responsible | Dependencies | Milestone | Cost Estimate |
| T-01 | Initial System Assessment | April 2024 | May 2024 | IT Director | None | Project Kick-off | $50,000 |
| T-02 | Infrastructure Upgrade | June 2024 | July 2024 | Infrastructure Team Lead | Successful Initial Assessment | Infrastructure Ready | $200,000 |
| T-03 | Pilot Deployment | August 2024 | September 2024 | Project Manager, IT Team | Infrastructure Upgrade Completion | Pilot Success | $100,000 |
| T-04 | Training Program Development | June 2024 | July 2024 | Training Coordinator | N/A | Training Materials Ready | $30,000 |
| T-05 | Phased Roll-Out | October 2024 | March 2025 | Deployment Team | Pilot Deployment Success | Full System Live | $300,000 |
| T-06 | Post-Deployment Support Setup | March 2025 | Continuous | Support Team Lead | Full Deployment | Ongoing Support Initiated | $120,000 |
| T-07 | Final System Evaluation | April 2025 | April 2025 | Quality Assurance Lead | Complete Deployment | Project Closure | $15,000 |

**Implementation Schedule**

**Implementation/Deployment Approach:**

Phased Approach: Gradual migrations to the cloud system, with less key facts and services.

Big Bang for Specific Features: Certain new features, like better or improved security protocols, might be rolled out across all departments simultaneously.

Backout Strategy: In case of vast problems, a plan to revert to the previous structures or to a stable version or state of the brand-new machine.

**Training of Implementation Staff:**

Comprehensive training will include:

Technical Training for IT Staff: Focused on systems maintenance, security, and troubleshooting.

Operational Training for End-Users: Ensuring all employees are comfortable with the new systems interface and functionalities.

**Client Resource Allocation:** Resource allocation covers hardware enhancements if wanted; software licensing for the cloud platform, and schooling resources. A project crew, along with a venture manager, cloud professionals, and a training coordinator, will be assigned.

**Client Communication Plan:** A structured conversation plan to keep stakeholders knowledgeable consists of regular project information updates, make time or a session before the major rollouts, and comments mechanisms post-implementation.

**Cost Implications and Required Manpower for Initialization:** The projected budget for the implementation is estimated at 5 million CAD, which covers software licenses, hardware upgrades, training programs, and personnel costs. The project will need the project management team to be involved full time, also select the required IT staff, and temporary contractors for any specialized roles that we need.

**Implementation/Deployment Strategy Impact:** The successful implementation of the cloud-based data management system is expected to significantly improve or better BMOs data processing competencies, enhance data driven selection making, and improves information security features, contributing to better customer service and a strong competitive position in the market.

# Test Strategy

**Objective:** Based on the requirements acquired during the project start phase, BMO's first testing scope would be established. The components of the program or system that must be evaluated to guarantee its dependability and quality are described in this scope. We aim to improve efficiency and customer satisfaction.

* Performance optimization with maximizing efficiency with reduced cost.
* Use data efficiently to enhance decision-making capabilities.
* Enhance security measures.
* Make a better interface for customers for good customer experience and satisfaction.

## Testing Methodology

* **Levels of Testing:**
  + **Unit Testing:** This testing is conducted by developers focusing on individual components of the cloud system.
  + **Integration Testing:** In this testing phase the tester ensures that integrated components work together smoothly like when new digital implementations are used in the existing system.
  + **System Testing:** To validate the complete and integrated software product.
  + **User Acceptance Testing (UAT):** To confirm the system meets BMO's requirements and is ready for live deployment.

|  |  |  |
| --- | --- | --- |
| Name | Roles | Responsibilities |
| Froyd Francis | QA Lead | To oversee the testing process, ensure coverage, and manage defect tracking. |
| Harmanpreet Singh | IT Department | To provide technical support and ensure environment readiness. |
| Dikshita Jain | Business Analysts | To validate testing scopes and align with business requirements. |

* **Roles and Responsibilities:**

## Test Environment

* **Setup Requirements:** Mirrors production environment with test data migrated.
* **Backup and Restore Strategy:** To ensure test data integrity and availability throughout the testing phases.

## Testing Tools

* **Automation Tools:** Selenium for web interface testing, and JMeter for performance testing.
* **Test Management Tools:** JIRA for test case management, defect tracking, and reporting.

## Release Control

* Includes version control practices to manage code deployments across environments ensuring traceability.

## Risk Analysis

* **Data Loss:** Implement rigorous data backup and validation checks.
* **Security Breach:** Regular security audits and penetration testing to identify vulnerabilities.
* **Integration Failures:** Extensive integration testing with legacy systems.

## Review and Approvals

* Regular review meetings with stakeholders for progress updates and to address any concerns.
* Final sign-off from Business Owners, IT Security, and Compliance Teams upon successful completion of UAT.

# Specific Test Activities Solution

**Test Activity Timeline:**

|  |  |  |
| --- | --- | --- |
| Activity | Description | Timeline |
| Data Migration Testing | Ensure all data is accurately transferred and intact. | July 2024- August 2024 |
| Security Testing | Validate encryption, access controls, and compliance with financial industry standards. | August 2024 -September 2024 |
| Performance Testing | Assess system behavior under peak loads. | October 2024- December 2024 |
| UAT | Conducted by end-users to ensure the system meets operational needs. | January 2025 – March 2025 |

## Handling Defects:

* **Defect Tracking:** Utilize JIRA for recording, tracking, and managing defects.
* **Retesting:** Defects fixed by developers will be retested to ensure issues are resolved.
* **Regression Testing:** Conducted post-fix to ensure no new issues were introduced.

## Sign-offs Required:

* **QA Lead:** Post each major testing phase.
* **Project Sponsor:** After UAT completion and before production deployment

|  |  |  |
| --- | --- | --- |
| Position | Name | Date |
| Project Sponsor | JB Abbas | April 04, 2024 |
| Project Manager | Aum Patel | April 04, 2024 |
| QA Lead | Froyd Francis | April 04, 2024 |

# As-is process flow

**1) Data Collection:**   
  
The data pool is built from various sources, including client transactions, account activities, and market data.  
Manual entry, automated processes, and third-party interfaces collect data.   
  
**2) Data Storage:**   
  
Data is stored on-premises in servers and databases.   
Multiple data silos exist across several departments and systems, resulting in fragmented storage.

**3) Data Processing:**

Data processing entails sorting, filtering, and organizing the acquired data.   
Data cleansing and normalization typically include batch processing and manual interventions.

**4) Data analysis:**   
  
Analytical tools and software are used to derive insights from processed data.   
Specialized teams or analysts frequently use static reports and prepare queries to conduct analyses.

**5) Data Access:**   
Roles and permissions determine data access.

Requests for data access or specific reports may need to be manually approved and retrieved.

6**) Security Measures:**  
Firewalls, access control, and user authentication are all examples of security protocols.   
Regular security audits are conducted to discover vulnerabilities and verify compliance with industry standards.

**7) Reporting and Decision-Making:**   
  
 Reports and dashboards are created for management and stakeholders.   
 Decision-making is based on past data and established metrics, with minimal real-time insights.

This "As-is" process flow focuses on BMO's present data management procedures, emphasizing areas for improvement and optimization through the proposed cloud-based system implementation.

# Transition Requirements

**a) Data Migration Strategies:**

Create a comprehensive plan for moving existing data from on-premises servers to the cloud-based platform. Data migration is prioritized depending on its importance and relevance to ongoing operations. Extensive testing and validation are conducted to verify data integrity and consistency after migration.

**b) Legacy system decommissioning:**

Identify and document any legacy systems and components that will be replaced with the new cloud-based platform. Establish a schedule for retiring legacy systems while minimizing the impact on continuing operations. Implement data archiving and backup strategies for historical data housed in legacy systems.

**c) User training and adoption:**

Create training programs and resources to introduce users to the new cloud-based data management solution. Provide continual support and coaching to users during the transition phase to help them adapt. Solicit user feedback to discover areas for improvement and swiftly address any concerns.

**d) Change management:**   
Implement a change management strategy to overcome resistance and increase acceptance of the new system. Regularly communicate with stakeholders to provide updates on the transition process and answer any issues they may have. Establish clear roles and responsibilities for managing the transition, including dedicated change management personnel.

**f) Post-transition Evaluation:**   
Conduct a post-transition evaluation to determine the transition process's success and identify improvement areas. Gather feedback from users, stakeholders, and project team members to help guide future transition efforts. Document the lessons gained and best practices to help guide future transitions and system improvements.

# Potential solution options (incl “do nothing”)

**Description:** BMO keeps the data management and analysis systems it currently uses the same.

**Fit within BMO:** This choice aligns with the organization's current procedures and systems but might impede creative thinking and productivity gains.

**Assessment:**

1. **Cost:** minimal upfront outlay of funds, but possible ongoing expenses due to inefficiencies and lost opportunities.
2. **Impact on Business Objectives:** Much has yet to be done to fulfill functional requirements and business objectives.
3. **Resource Utilization:** Inefficiencies may result from using already available resources as best they can.
4. **Risk:** There's a good chance you'll need to catch up to rivals and become obsolete with technology.
5. **Implementation Readiness:** Because implementation only entails maintaining current systems, it requires little work.

# Evaluation criteria

1. **Cost:**

* One-time payment plus continuous running costs.
* Possible financial benefits or yield on investment for BMO.

1. **Effect on Business Objectives:**

* Compliance with the aims and objectives of BMO.
* Enhancement of competitive advantage, customer satisfaction, and efficiency.

1. **Utilization of Resources:**

* Need for both external and internal resources.
* Specific skills and knowledge are needed for implementation and continuing maintenance.

1. **Risk:**

* hazards related to data security, implementation, adherence to regulations, and dependence on outside sources.

1. **Implementation Readiness:**

* Viability given BMO's existing resources and limitations.
* Readiness to deal with difficulties and roadblocks that may arise during execution

By comparing every possible solution to these standards, BMO can make an informed choice that supports its strategic aims and objectives.

# Solution requirements (functional and non-functional)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Section | Requirement Identifying Number | Requirement Description | Requirement prioritization (H, M, L) | Traceability | Requirement Notes |
| Functional | FR-01 | Implement Efficient data management tools and analysis for better output | H | RFI traceability requirements, Business Objectives | Implement new strategies |
| Functional | FR-02 | Ongoing discussion about technological advancement | H | RFI traceability requirements, Business objectives | Staying updated with technology |
| Functional | FR-03 | Focus on data analysis as per customer and market trends | H | RFI traceability requirements, Business objectives | Use analysis tools for better response to customers. |
| Functional | FH-04 | Conduct risk analysis | M | RFI traceability requirements, Business objectives. | Identify risk at an early stage for less operation cost. |
| Non-Functional | FH-05 | Gather data from customer | M | RFI traceability requirements, Business objectives. | Collect data for improving benefits and cost optimization. |
| Functional | FH-06 | Ensure data security | H | RFI traceability requirements, business objective | Customer and operation data should be safe. |
| Non-Functional | FH-07 | Evaluate customer data | L | RFI traceability requirements, business objectives | For better service to customers. |
| Functional | FH-08 | Restrict unauthorized access | H | RFI traceability requirements, compliance standards | Restrict unauthorized access in the working environment. |
| Functional | FH-09 | Implement the best possible measures | H | RFI traceability requirements, compliance standards | The best possible solution applied to achieve objectives. |
| Functional | FH-10 | Focus on improvement | M | RFI traceability requirements, Business objectives | Improvement should be reflected in the system ASAP for further continuity. |
| Non-functional | FH-11 | Enforce access control | H | RFI traceability requirements, Compliance standards | Give access to the working environment. |
| Non-Functional | FH-12 | Instance response | M | RFI traceability requirements, Business objectives | Fast response for customer satisfaction |
| Non-functional | FH-13 | Design system | L | RFI traceability requirements, Compliance standards | Develop a pattern for workload. |
| Non-functional | FH-14 | Maintain risk issue | H | RFI traceability requirements, business objectives. | Minimize the risk of security issues. |

# Overview of the selected company

The selected company, BMO (Bank of Montreal), is a leading financial institution with a rich history spanning over 200 years. As one of Canada's largest banks, BMO provides a wide range of financial services to millions of customers across North America and internationally. With a focus on innovation and customer-centric solutions, BMO has established itself as a trusted partner for individuals, businesses, and institutions alike. The company's commitment to digital transformation and excellence in service delivery underscores its position as a market leader in the financial sector.

# Competitive analysis findings

**Market Positioning:** BMO is one of Canada's largest banks, with a strong presence in North America and abroad. Its lengthy history and emphasis on innovation distinguish it as a trustworthy and respectable financial organization in the industry.

**Digital Transformation**: BMO's commitment to digital transformation is consistent with industry trends and consumer expectations. BMO hopes to improve efficiency, customer service, and competitive advantage by expanding data management capabilities via cloud-based technologies.

BMO's digital transformation strategy aims to increase data accessibility, security, and analytics capabilities. These goals are critical for competitiveness in the changing financial landscape and satisfying client expectations for seamless digital interactions.

**Risk Management:** BMO recognizes various risks of installing cloud-based technologies, including data security breaches, vendor dependency, and regulatory compliance changes. Mitigation techniques, such as solid data encryption, vendor agreements, and regulatory monitoring, indicate BMO's proactive commitment to risk management.

**ROI Analysis:** The projected ROI for installing the cloud-based data management system is significant, indicating that the investment is justified in anticipated benefits over the next five years. The expected annual income increases and cost savings from increased efficiency strengthen the project's business case.

**Implementation Strategy:** BMO's phased implementation method, combined with comprehensive training programs and stakeholder involvement, demonstrates a well-thought-out strategy for minimizing disruption and increasing uptake. Clear milestones, cost estimates, and resource allocation reflect thorough planning and execution.

# Project selected.

**Revenue Growth:** With the introduction of the cloud-based data management system, BMO expects a consistent increase in revenue over the next few years. The predicted annual sales increase of $50,000 in Year 1 and $25,000 yearly is expected to add to BMO's overall revenue growth. Furthermore, efficiency improvements from lower operational expenses due to cloud efficiency could boost revenue growth.   
  
**Cost savings:** BMO stands to gain from lower operational costs due to cloud efficiency. These savings, estimated at $20,000 annually, will boost the bank's profitability. BMO can achieve long-term cost savings by optimizing resource utilization and streamlining procedures using the new technology.

**Return on Investment (ROI):** The essential ROI study shows that BMO will see a significant return on investment over five years, with an ROI of 122.22%. This demonstrates that the bank's investment in a cloud-based data management solution is sensible and will provide significant value. The anticipated benefits, such as revenue growth and cost savings, outweigh the entire cost of implementation.  **Market Positioning and Competitive Advantage:** By expanding data processing capabilities, enabling data-driven decision-making, and boosting information security, BMO can increase its market position. The strategy emphasis on digital transformation is consistent with industry trends and consumer expectations, allowing BMO to differentiate itself from competitors while maintaining a solid market presence.

**Customer Satisfaction and Service Improvement:** Implementing a cloud-based data management system will improve customer service and satisfaction. Using data analytics to understand client wants and preferences, BMO can customize its products and services to changing market demands. Improved data accessibility and security safeguards will increase client trust and confidence.

To summarise, the projected picture for BMO is encouraging, with expected revenue growth, cost savings, ROI, competitive advantage, customer satisfaction, and operational efficiency arising from installing the cloud-based data management system.

# Database design

A screenshot of a computer

Description automatically generated

# List of team members and responsibilities

|  |  |  |
| --- | --- | --- |
| Team | Designation | Responsibilities |
| Aum Patel | Project Manager | - Overall project coordination and management.  - Stakeholder communication and alignment.  - Risk management and mitigation planning. |
| Froyd Francis | QA Lead | - Overseeing the testing process.  - Ensuring test coverage and quality assurance.  - Defect tracking and management. |
| Harmanpreet Singh | IT Department Lead | - Providing technical support and expertise.  - Ensuring environment readiness for deployment.  - System integration and compatibility testing. |
| Dikshita Jain | Business Analyst | - Validating testing scopes against business requirements.  - Facilitating communication between technical and business teams.  - Ensuring alignment of testing strategies with business objectives. |
| Urvish | Database Administrator | - Database design and management.  - Ensuring data integrity and security.  - Performance tuning and optimization |
| Vijay | Deployment Specialist | -Handling deployment of the cloud-based solution.  -Setting up the necessary infrastructure.  - Ensuring smooth transition to the new system. |

# Description of the problem to be solved

BMO (Bank of Montreal) is currently facing several data management difficulties that must be handled for the company to remain competitive and fulfil the changing needs of its customers and regulations.

These challenges include:

**Inefficient Data Management:** BMO's present data management systems need to be more cohesive and complete, resulting in inefficiencies in data collection, storage, processing, and analysis. This fragmentation impedes the bank's capacity to access, analyze, and efficiently use data for decision-making and client service.

**Limited Data Accessibility:** Siloed data storage across departments and systems limits access to crucial information, impeding cooperation and timely decision-making. Employees may need help to obtain the required data, resulting in delays and inferior outcomes.

**Lack of Analytics Capabilities:** BMO's existing data management systems need to support sophisticated analytics, restricting the bank's capacity to extract relevant insights from its data. BMO may recognize the potential for revenue growth, cost reductions, and risk avoidance without comprehensive analytics capabilities.   
  
**Inadequate Infrastructure:** BMO's current infrastructure may need to be more scalable and flexible to support its future growth and digital transformation aspirations. Upgrading to a modern, cloud-based data management system is critical for improving scalability, agility, and cost-efficiency.   
  
**Competitive Pressures:** In today's digital age, financial institutions face stiff competition from both traditional banks and fintech firms. To maintain a competitive advantage, BMO must modernize its data management skills to provide better client experiences, innovate faster, and keep up with industry changes.

# Business Requirements

**The business requirements for BMO's data management solution include:**

**Scalability:** The solution should accommodate BMO's growing data volume and user base without compromising performance.

**Security:** Robust security measures must be implemented to protect sensitive customer information and ensure compliance with regulatory standards.

**Efficiency:** The system should streamline data processes, reducing manual effort and improving operational efficiency.

**Accessibility:** Ensure easy and secure access to data for authorized users across multiple devices and locations.

**Integration:** Seamless integration with existing systems and applications to facilitate data flow and interoperability.

**Analytics:** Advanced analytics capabilities to derive actionable insights from data, supporting informed decision-making and strategic planning.

**Compliance:** Adherence to regulatory requirements and industry standards to mitigate legal and reputational risks.

**Customer Experience:** Enhance the overall customer experience by leveraging data to personalize services and improve satisfaction.

**Cost-effectiveness:** Achieve a balance between functionality and cost to ensure the solution delivers value within budget constraints.

**Scalability:** The solution should be scalable to accommodate future growth and evolving business needs.

# To-be process flows

**Data Collection:**   
  
The data-collecting process will be optimized using automated methods and real-time interfaces to quickly capture client transactions, account activities, and market data. Manual entry will be reduced, and data will be collected automatically from numerous sources.  
  
**Data Storage:**  
Data will be securely kept in the cloud, avoiding fragmented storage across multiple computers. A centralized data repository will be created to ensure data integrity, accessibility, and scalability. Advanced data management technologies will enable more efficient storage and retrieval.   
  
**Data processing:** This will be automated and optimized by powerful algorithms and analytics tools, including sorting, filtering, cleansing, and normalization. Batch processing and manual interventions will be reduced, increasing efficiency and accuracy.

**Data Analysis:** Advanced analytics can provide valuable insights into customer behavior, market trends, and business performance. Real-time analytics dashboards and reports provide decision-makers with timely information for strategic planning.   
  
**Data Access:** Authorized users will have secure and intuitive access to pertinent data with role-based permissions. Requests for data access or specialized reports will be automated, minimizing manual approval processes and increasing response.   
  
**Security measures:** This will prevent unauthorized access, breaches, and cyber dangers. Encryption, access controls, and regular security audits will ensure adherence to industry standards and regulatory obligations.

By implementing these future process flows, BMO will optimize its data management capabilities, improve operational efficiency, and create improved client experiences per its digital transformation strategic goals.