



# Enterprise Bank: Analysis of API vendors for Middleware Infrastructure Strategy

Enterprise Bank: Team 7 Capstone Project Report Spring / Summer 2023

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## ABSTRACT

Enterprise Bank is working on a Core Banking and API/Middleware strategy that will involve building a middleware platform, restructuring some of their integrations, and taking on new vendors to assist in the planning and implementation. As a first step, Enterprise Bank has enlisted the help of students from the Manning School of Business to help investigate potential vendors and present a gap analysis on Fiserv's Communicator Open. This project aims to provide Enterprise Bank with the knowledge and insights required to make meaningful decisions around their API/Middleware strategy, enabling them to enhance the customer experience, improve the efficiency of their operations, and improve the consistency and quality of their data.

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## COMPANY OVERVIEW

Enterprise Bank is a community bank headquartered in Lowell, MA, established in 1989. It serves businesses, nonprofits, and individuals in the New England area. The bank provides various financial services, including checking accounts, loans, and mobile banking.

## PROJECT OBJECTIVES AND SCOPE

**Identify API vendors/partners who work with the banking industry:** Work with the Enterprise Bank IS team to identify a list of vendors who provide API middleware and managed services with a specialization in the banking industry.

**Conduct and document scripted interviews for industry insights:** Establish an interview process to gather and document insights and recommendations from other banks that are leveraging the Fiserv Open Banking solution, Communicator Open.

**Compare approaches:** Evaluate different approaches for API, data, and middleware strategies, including researching and facilitating demonstrations of solution providers like MuleSoft, Snowflake, and Denodo and looking at Integration Platforms-as-a-Service (IPaaS) to identify the most suitable options for Enterprise Bank.

**Assess vendor suitability for Enterprise Bank:** Evaluate the suitability of each vendor in meeting Enterprise Bank's requirements. The evaluation criteria include:

1. Middleware / API capabilities
2. Data access and governance
3. Security and regulatory compliance
4. Integrations with third-party vendors
5. Scalability and performance
6. Cost and licensing

## MILESTONES

### Milestone 1 (Sept 01):

- **Activity:** Meeting with sponsors to determine the project scope, goals, and data availability.
- **Objective:** Establish a clear understanding of the project's direction and the resources available.

### Milestone 2 (Sept 30 – Oct 06):

- **Activity:** Presentation of insights from bank interviews to the Enterprise Bank team.
- **Objective:** Share interview findings and observations to inform and guide the project's next steps.

**Milestone 3 (Oct 09 - Nov 03):**

- **Activity:** Gap analysis presentation to Enterprise Bank.
- **Objective:** Identify and present any disparities between current processes and desired outcomes or best practices.

**Milestone 4 (Nov 06 – Dec 01):**

- **Activity 1:** Presentation of insights and recommendations regarding vendors.
- **Activity 2:** Generation of a Request for Proposal (RFP) for vendors.
- **Activity 3:** Preparation of the Final Project Presentation.
- **Objective:** Finalize the vendor selection process and prepare to present the project's findings and conclusions.

**Milestone 5 (Dec 04 – Dec 08):**

- **Activity:** Submission of all Project Deliverables with approvals from the Sponsor and Faculty Mentor.
- **Objective:** Ensure that all project components are complete, approved, and submitted as per the project requirements and timelines.

## DELIVERABLES TO ENTERPRISE BANK

1. Generate templates for interviews with vendors and banks.
2. Present insights gathered from interviews with Enterprise Bank.
3. Present gap analysis to Enterprise Bank.
4. Generate request for proposal template for future vendor engagement.
5. Create a BI dashboard to visualize vendor information and insights gathered from interviews.

## APPROACH

**Phase 1: Requirements & Research**

- Discussions with Enterprise Bank's IS team.
- Preliminary research on API strategies.
- Inventory of BPM integrations.
- Interviews are set up with banks and vendors.

**Phase 2: Interview SOP Development**

- Meeting with Enterprise Bank and UML teams.
- Creation of uniform interview templates.
- Scheduling of interviews with vendors and banks for insights.

**Phase 3: Data Collection & Analysis**

- Analysis of interview data.
- Gap analysis on BPM/Fiserv Communicator Open.
- Comparison of API and middleware solutions.

**Phase 4: Vendor Evaluation**

- Shortlisting vendors based on interviews and external research.
- Recommendations for vendor selection.

- Creation of RFP for vendors.

## FISERV COMMUNICATOR OPEN

Fiserv Communicator Open is an integration solution for simplifying integration for financial institutions that use Fiserv account processing platforms, enabling them to customize their technology ecosystems and access third-party Fintech capabilities.

Fiserv Communicator Open benefits banks that pursue open finance strategies and remain competitive. It helps banks solve:

- Simplify complex integration needs,
- Readily access third-party capabilities requirement,
- Address security and compliance concerns for banks.
- Assist banks in automating and streamlining communication processes.
- Reduce huge front investment but enable robust Data capability.

## SOLUTION VENDORS

Solution vendors provide solutions or implementation services to companies. Several solution vendors offer products to banks and other financial institutions in banking and financial technology. Some prominent solution vendors in this space include:



API People specialize in middleware and API solutions, offering seamless integration, robust security, and compliance with GDPR/HIPAA. Their scalable platform supports diverse business needs with user-friendly training and flexible subscriptions. They focus on innovation in API management. Banc of California has praised API People for their effective solutions. They are recognized leaders in financial technology, delivering streamlined and reliable services.



PortX is a leading cloud-native middleware and API solutions provider specializing in API-managed services. Their platform supports API strategy, development, management, and security, fostering seamless integration. PortX prioritizes security, GDPR and HIPAA compliance, and

data-related software integration. The scalable platform, emphasizing horizontal scaling and load balancing, ensures optimal performance. PortX provides training, support, and a roadmap highlighting emerging technologies and enhanced security.

## API AND MIDDLEWARE VENDORS

API (Application Programming Interface) and middleware vendors provide tools and platforms that enable applications and systems to communicate and integrate seamlessly. These technologies are crucial for modern software development, allowing different components, applications, and systems to work together efficiently. Here are some notable API and middleware vendors.

### DENODO

Denodo is a data virtualization platform specializing in API-managed services and middleware, known for streamlining data integration and access. Its key features include real-time data access, API management, and an integrated data layer. The platform offers agility, governance, and security, leading to cost reductions and performance optimization. Denodo integrates with various systems like data warehouses, cloud services, and BI tools and supports scalability through advanced architectural features. It offers extensive training and customer support and is used by companies like Ultra Mobile and Seacoast Bank. Future plans include AI (Artificial Intelligence) integration, which strongly focuses on regulatory compliance and data security.

### MULESOFT

MuleSoft provides a unified API management and middleware platform, enabling organizations to connect and integrate applications, data, and devices seamlessly. Its flagship product, Anypoint Platform, offers comprehensive capabilities for designing, developing, publishing, securing, and managing APIs (Application Programming Interface). MuleSoft's solutions enhance agility, efficiency, scalability, and security, enabling organizations to connect applications from disparate sources, integrate legacy systems with cloud applications, automate business processes, protect sensitive data, and scale to meet growing needs.

### JIFFY.AI

Jiffy.ai offers comprehensive middleware and API solutions for automation, API management, and intelligent document processing. Their platform, designed for scalability and seamless integration, enhances middleware capabilities with the no-code platform, intelligent document processing, and workflow orchestration features. Jiffy.ai ensures data protection and compliance with GDPR, SOC, ISO (Information Security Office), and HIPAA standards. The platform's scalability is demonstrated through successful implementations in financial institutions, global banks, and regional banks, achieving improved performance and efficiency. Jiffy. Ai's

subscription-based pricing model and commitment to ongoing development, including AI integration and a focus on customer support, make it a leading choice for organizations seeking middleware and API solutions.

## BANK INTERVIEW INSIGHTS AND RECOMMENDATIONS

BANC OF CALIFORNIA



Banc of California adopted Communicator Open to address the shift to cloud infrastructure and leverage its RESTful capabilities, streamlining integrations. Challenges emerged during an initial vendor collaboration, which was resolved by partnering with API People. Critical features like RESTful nature enhanced operations, enabling middleware solutions for third-party fintech integration, notably in CRM.

Banc of Cal advises embracing Communicator Open's RESTful capabilities for streamlined operations. They recommend partnering with API People to overcome integration challenges. Implementing robust security and governance measures also ensures a secure and compliant environment for seamless financial technology integration.



BANK OF TAMPA

The Bank of Tampa

Bank of Tampa (BoT) adopted Communicator Open to address dissatisfaction with Fiserv's customer support and product functionalities. Communicator Open's middleware capabilities, facilitated by integration with MuleSoft, enabled feature expansion, reduced reliance on Fiserv, and enhanced data governance. As exemplified by Microsoft Dynamics CRM, seamless integration with third-party fintech highlighted bidirectional communication benefits. BoT collaboratively implemented Communicator Open with a solutions vendor, maintaining a small development team with stringent governance, including NAICS code alignment and considerations for SOA.

Licensing demonstrates BoT's strategic approach.

Bank of Tampa (BoT) advises exploring independent integrators such as Clarium for vendor selection. They advocate for robust middleware solutions like MuleSoft to enhance integration capabilities. Additionally, leveraging Communicator Open is recommended to streamline operations and achieve a comprehensive, efficient technology ecosystem.

## COMMUNICATOR OPEN GAP ANALYSIS

Fiserv Communicator Open offers a comprehensive value proposition for Enterprise Bank, addressing various needs such as enhanced integration with financial networks, improved customer experience through user-friendly interfaces, advanced security for financial data protection, scalability, cost-effectiveness, compliance ease, real-time processing and analytics, and innovative financial offerings.

The analysis identified significant challenges in Enterprise Bank's current state, primarily due to heavy reliance on outdated legacy technology and limited capability to integrate with modern

fintech services. This has hindered innovation and expansion capabilities, particularly evident in the limited digital account opening processes in 2022. Communicator Open presents a solution to these challenges by offering a flexible platform for API access and simplifying the maintenance of integrations.

## KEY FINDINGS

**Integration Gaps:** A need for streamlined integration across banking systems was identified, aiming to reduce complexity, improve data quality, and cut maintenance costs.

**Data Processing and Real-time Analytics:** The bank requires enhanced real-time data processing capabilities for improved operational efficiency and decision-making.

**Third-Party Integrations:** Flexibility in third-party integration is crucial to embrace fintech innovations and competitive services.

**Customer Experience:** A unified customer data approach is needed for personalized and seamless banking experiences.

Strategically, these gaps offer an opportunity for operational and strategic change in the bank's technology ecosystem. Adopting Communicator Open, alongside a middleware strategy and platform, is proposed to address these gaps and future-proof the bank's architecture. This approach minimizes dependence on a single vendor, enhancing the banking experience and improving data quality across systems.

### **The slide section at the end of the report will outline the following:**

1. There are differences between Communicator Open and their current solution, Premier SOA.
2. Comparison of current bank architecture vs potential architecture using middleware solution in conjunction with Communicator Open.

## VENDOR EVALUATION DASHBOARD

Enterprise Bank will be continuing this project well into 2025. We found that they must have quick and easy access to the insights from this exploratory phase. To that end, we have created a descriptive analytics dashboard in PowerBI that will grant the team access to all the high-level data collected during this project. It allows the bank to view vendor overviews, services/pricing models, and customer reviews. The slide section at the end of the report will include example screenshots of the report.

## CONCLUSION

Enterprise Bank's strategic initiative to enhance its Core Banking and API/Middleware infrastructure requires careful consideration of vendor capabilities and a deep understanding of the bank's current technological landscape. Key insights from the analysis reveal the necessity for robust middleware integration, highlighting significant gaps in data processing, real-time analytics, and third-party integrations. The reliance on outdated legacy systems, especially in digital account opening processes, underscores the urgency for a digital transformation. Furthermore, the need for a flexible, customer-centric approach to technology adoption is



paramount to enhance the overall customer experience and maintain a competitive edge in the rapidly evolving banking sector.

It is recommended that Enterprise Bank adopt Fiserv's Communicator Open, coupled with a strategic middleware platform, to address these critical gaps. This approach future-proofs the bank's technological infrastructure and reduces dependence on a single vendor, enhancing operational efficiency and data quality. Strategic partnerships with solution providers like API People and MuleSoft, tailored to Enterprise Bank's specific needs, are also advisable.

## WORK CITED

### Enterprise Bank Internal Documents:

*Enterprise Bank: "Core Banking Roadmap" 2023*

*Enterprise Bank: "Core Solution Map" 2023*

### Vendor Information:

*MuleSoft: "MuleSoft 101" 2023*

*PortX: "PortX Sales Deck: 2023*

*Vendor Websites:*

**Communicator Open:** <https://www.fiserv.com>

**MuleSoft:** <https://www.mulesoft.com/platform/api>

**APIPeople:** <https://apipeople.com>

**Denodo:** <https://www.denodo.com>

**Jiffy.AI:** <https://www.jiffyai.com>

**Fiserv Open Data:** <https://www.fiserv.com>

### Bank and Vendor Insights:

*Vendor interview notes. Internally shared with Enterprise Bank.*

## ACKNOWLEDGMENTS

We are incredibly grateful for the invaluable support and guidance provided by our project sponsors at Enterprise Bank. Hicham Naciri, Carolyn Mansour, Eric Pearson, Michael Angell, and Karen Merrill. Their patience and dedication throughout this journey have facilitated our learning and greatly enriched our experience.

Our heartfelt thanks also go to our mentors, the Manning School of Business faculty members who mentored and guided us through this project. We are particularly grateful to Dr. Luvai Motiwalla and Dr. Amit Deokar, whose wisdom and guidance were crucial in navigating the complexities of this capstone project. Their continuous support and encouragement have been vital in helping us understand and apply the intricate aspects of banking technology and project management. This capstone project has been a remarkable journey of learning and growth. The hands-on experience and the challenges we encountered have been integral in shaping our professional skills and perspectives. Working collaboratively with the team at Enterprise Bank, we have gained invaluable insights into the dynamic world of banking technology. This project has honed our analytical and strategic thinking abilities and provided us with a unique opportunity to apply our academic knowledge in a real-world setting. We are grateful for this experience, which has prepared us for future business and technology endeavors.

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CAPSTONE PROJECT, FALL 2023



## ENTERPRISE BANK DATA ARCHITECTURE TRANSFORMATION

### ENTERPRISE BANK PROJECT SPONSORS:

**Hicham Naciri, Carolyn Mansour, Eric Pearson, Michael Angell, Karen Merrill**

### MANNING SCHOOL OF BUSINESS FACULTY ADVISORS:

**Dr. Luvai Motiwalla, Dr. Amit Deokar**

### TEAM MEMBERS:

**Andrew Mejia, Ashika Fnu, Ajay Kumar Bolla**



# **PROJECT BACKGROUND & GOALS**

## **Enterprise Bank:**

- Enterprise Bank was established in 1989 and headquartered in Lowell, Massachusetts and specializes in financial services such as checking accounts, loans, and mobile banking.

## **Project Overview:**

- Enterprise Bank is creating a Core Banking and API/Middleware roadmap to unlock functionality, remove dependency on a single vendor and build a core agnostic platform that will streamline operations, improve data quality and lead to improved customer journeys. This project is an exploratory phase to gather insightful information on various API/Managed Service vendors, solutions to manage the Middleware layer and Fiserv's Communicator Open solution.

## **Objectives and Goals:**

- Analyze Enterprise Bank's data architecture.
- Perform Gap Analysis on current integrations vs Communicator Open from Fiserv.
- Uncover managed service partners, middleware solutions and various approaches for building an API Strategy/Middleware platform.

## **Phase Approach:**

- Phase 1: Interview banks & vendors.
- Phase 2: Extract & document insights from interviews.
- Phase 3: Conduct Gap Analysis between Deposit Account Opening solution and Fiserv Communicator Open.
- Phase 4: Deliver presentations to Enterprise Bank on the above.

## **FISERV COMMUNICATOR OPEN**

Fiserv's Communicator Open streamlines integration for financial institutions with Fiserv platforms, enabling customization of technology ecosystems, easy access to third-party fintech, and support for open finance strategies.

### **Features & Functionality:**

- Normalized APIs.
- Sophisticated Technologies.
- Industry-Specific Services and Standards.
- Scalability & Capability.

### **Value add to Banking Infrastructure:**

- Integration of Third-Party Innovations.
- Enhanced Digital Experiences.
- Real-Time Analytics and Streamlined Processes.
- Extending IT Asset Value.
- Cost-Effectiveness.

# VENDOR OVERVIEW: SOLUTION VENDORS

## Solution Vendors Overview:

- Solution vendors play a crucial role in delivering integrated solutions, focusing specifically on integration projects within the banking technology sector.

## Vendor Highlights:

### 1. API PEOPLE:

- **Specialization:** Renowned for their expertise in API managed services, with specialization in Fiserv Premier and middleware solutions.
- **Focus Area:** Concentrates on integrating diverse banking systems.
- **Notable Achievement:** Received excellent feedback from Banc of California for their services.

### 2. PORTX:

- **Specialization:** Known for their proficiency in API managed services and middleware integration.
- **Focus Area:** Primarily caters to the specific needs of financial institutions.

## VENDOR OVERVIEW: API / MIDDLEWARE VENDORS

### **API / Middleware Vendors Overview:**

- API/Middleware vendors are key players in offering the necessary tools and platforms to facilitate and manage the data exchange between different banking systems.

### **Vendor Highlights:**

#### **1. Denodo:**

- Offers a data virtualization platform, streamlining data integration and management processes.

#### **2. MuleSoft:**

- Provides an additional abstraction layer in API architecture, enhancing the efficiency and maintenance API integrations.

#### **3. JIFFY.AI:**

- Specializes in automation solutions, leveraging AI and machine learning to boost middleware functionalities.



## INSIGHTS AND RECOMMENDATIONS FROM INTERVIEWS WITH BANK

### Insights:

#### Bank of Tampa (BoT):

- Initially sought more autonomy from Fiserv.
- Valued Communicator Open.
- Partnered with Clarim and MuleSoft.

#### Banc of California:

- Needed cloud-compatible solutions, leading to the adoption of Communicator Open.
- Appreciated the shift from SOAP to RESTful APIs.
- Overcame initial integration challenges by partnering with API People.

### Recommendations:

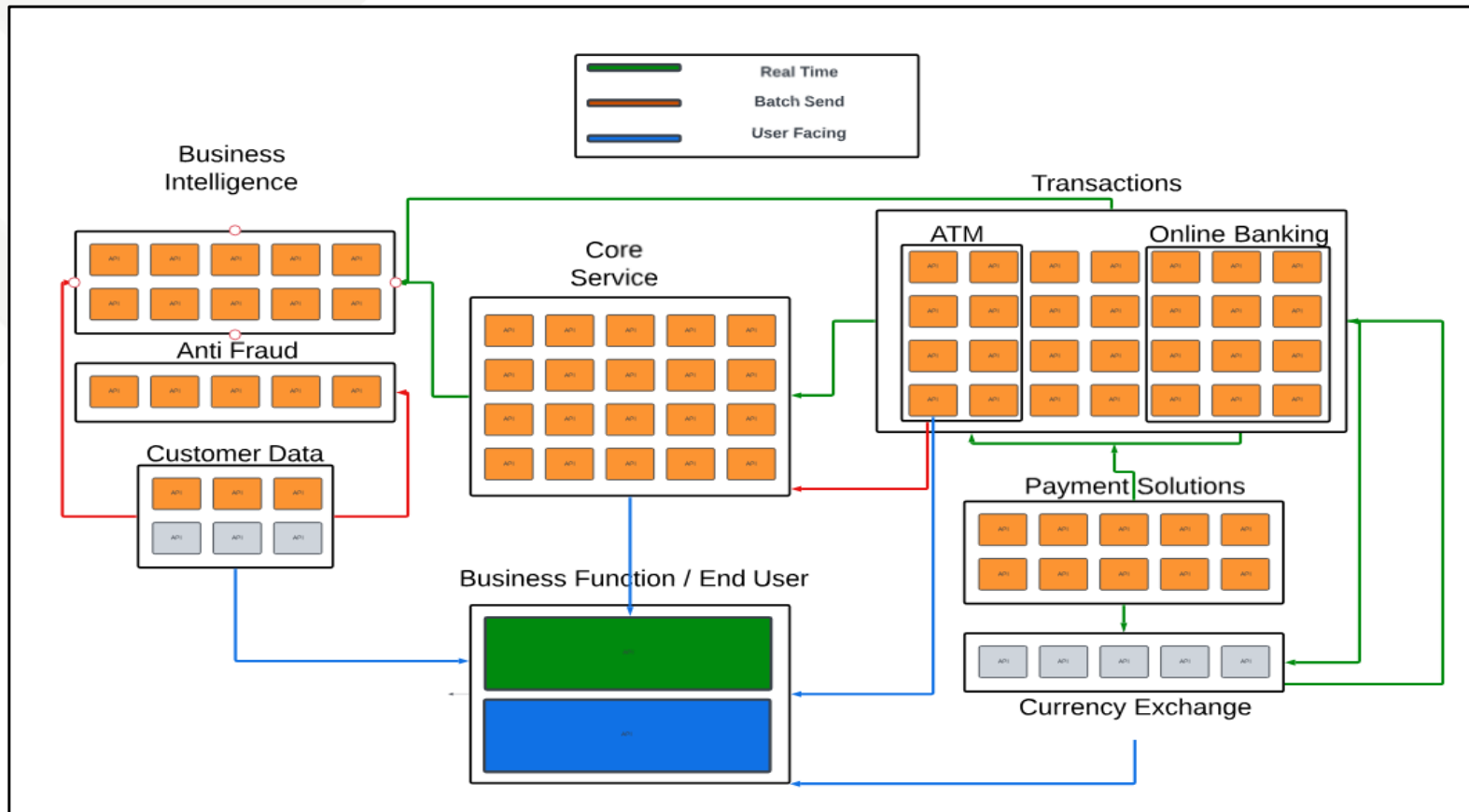
#### Bank of Tampa (BoT):

- Consider independent integrators like Clarim.
- Invest in robust middleware solutions like MuleSoft.
- Leverage Communicator Open.

#### Banc of California:

- Embrace the RESTful nature of Communicator Open.
- Partner with API People to overcome integration challenges.
- Implement robust security and governance measures.

## GAP ANALYSIS: MICRO-SERVICE DATA ARCHITECTURE

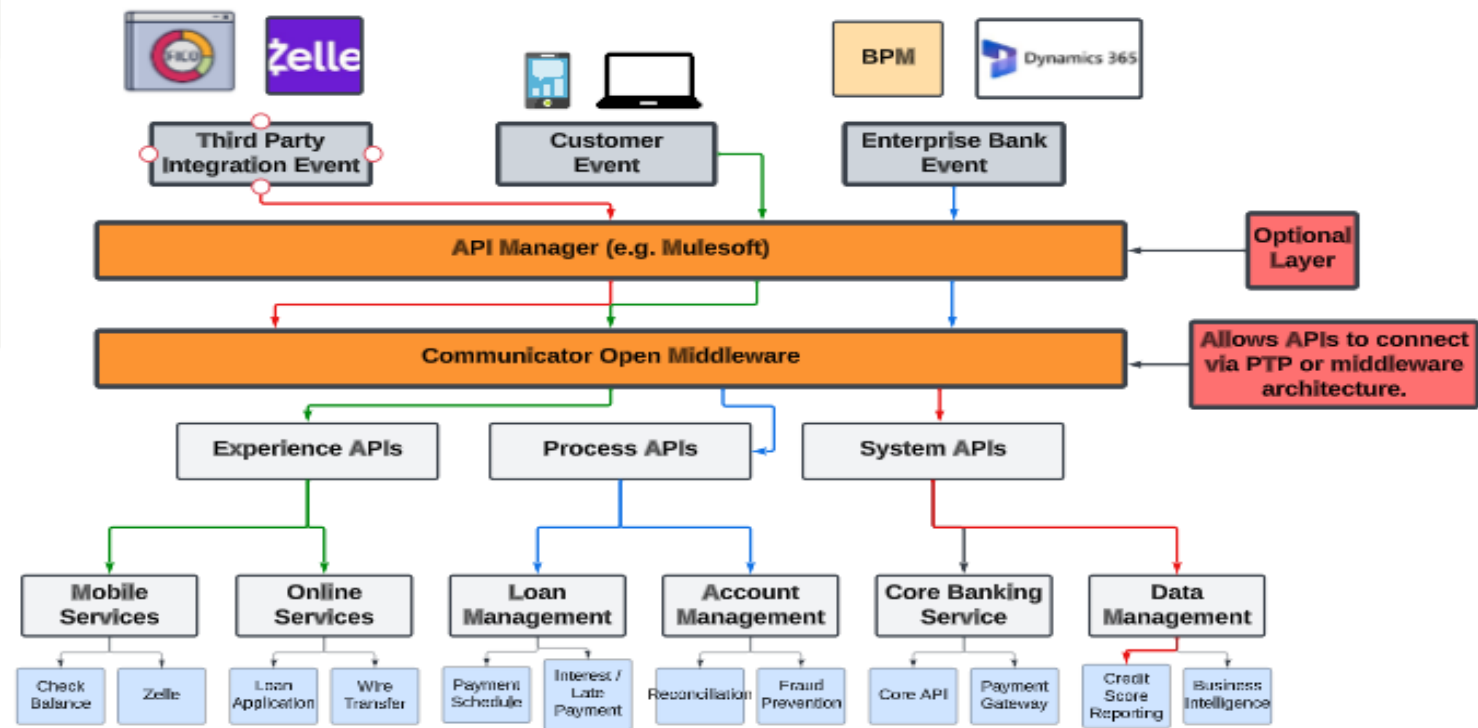


## COMMUNICATOR OPEN GAP ANALYSIS

### Fiserv Communicator Open Value Proposition:

- **Enhanced Integration:** Smooth connectivity with financial networks and services.
- **Improved Customer Experience:** User-friendly interfaces and engagement tools.
- **Advanced Security:** Superior protection of sensitive financial data.
- **Scalability and Flexibility:** Easily adaptable to growth and market changes.
- **Cost-Effectiveness:** Long-term savings through efficiency and lower maintenance.
- **Compliance Ease:** Tailored to meet banking regulatory requirements.
- **Real-Time Processing & Analytics:** For better decision-making and personalized services.
- **Innovative Offerings:** Enables offering of modern financial products and services.

## GAP ANALYSIS: MIDDLEWARE LED DATA ARCHITECTURE

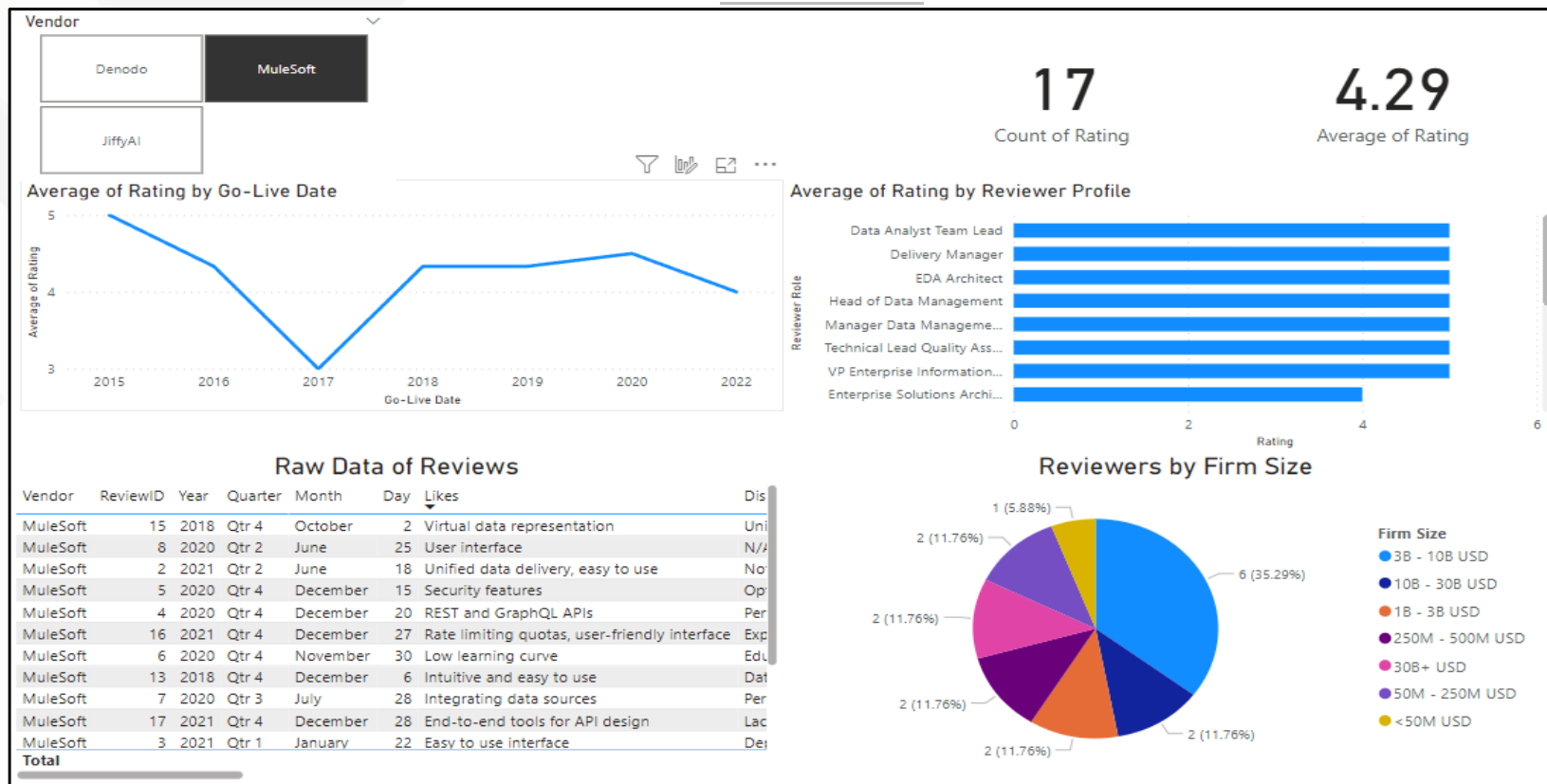


**Experience APIs:** Interface layer; customizes data for specific user experiences.

**Process APIs:** Middle layer; manages business logic and workflows.

**System APIs:** Base layer; connects to and secures back-end systems and databases.

# VENDOR EVALUATION DASHBOARD



## TAKE AWAYS

### **Conclusion:**

- Overall, this project served as an exploratory phase of building an API/Middleware strategy that will allow the bank to build a middleware platform that will allow the bank to remove dependency on a single vendor and build improved customer journeys. This assisted the bank to identify and summarize API/Middleware partners, middleware solutions and approaches for building a core agnostic middleware platform that will allow the bank to be nimble and enable engagement with other Fintech providers into the future.

### **Key Highlights:**

- MuleSoft and API People stood out compared to the rest of the vendors.
- A combination of vendors should be considered. No silver bullet.
- Collaboration with other banks helps identify approaches and lessons learned.

### **Going forward:**

There other constraints the team will need to consider after our project is concluded:

- Cost
- Engineers
- Timeline

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**THANK YOU!**

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SLIDE 12



MANNING SCHOOL OF BUSINESS



Carolyn Mansour <Carolyn.Mansour@ebtc.com>

To: MejiaBernal, Andres F; Motiwalla, Luvai F; **+4 others**

Cc: Bolla, AjayKumar; Ashika, FNU



Fri 12/8/2023 7:48 AM

**This Message Is From an External Sender**

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Hi Andrew and UML Team,

Thank you for the report. It is so helpful to have all this content and research pulled together in this manner and it will certainly help us hit the ground running with the vendor who is helping us build our Core Banking Roadmap. Just one very small correction on page 16 is to separate Denodo and Fiserv Open Data. These are two separate solutions and the description is for Denodo.

Because of all this work that you did, we are in a very good position to challenge the vendor who is working with us when it comes to the API/Middleware aspect of our roadmap. We are going into this having some solutions, partner and other bank insights. Having challenging and collaborative discussions has always yielded better results in our experience and your work is facilitating this for us.

With that small adjustment, you can consider this approved from my perspective.

Best of luck in your future endeavors. It was a pleasure working with all of you!

Carolyn

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