

"The Bank"

The Pros and Cons of Continuing with an In-House Core Processing System versus Moving to an Outsourced Delivery Channel

American Bankers Association
Stonier Graduate School of Banking
Capstone Project

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Executive Summary

"The Bank" is a small community bank that serves north-central Vermont and northern New Hampshire. Management's goal is to have responsible growth and continue to be financially strong to remain an independent bank. The Bank's market area is mostly rural, and growth in our rural markets has been stagnant over the past few years as populations age with younger residents leaving these areas for larger regions and cities. In 2019, the Bank opened two branches in the most populous county in Vermont in order to take advantage of growth opportunities. The Bank's objective is to be in a position to take advantage of opening de novo branches in expanding markets when opportunities arise as well as act on branch and bank acquisitions in order to continue growing the bank.

In all of the Bank's markets, there is competition from both financial and non-financial institutions. Competition comes from large and small banks, credit unions and non-financial institutions, and is putting pressure on maintaining and growing the Bank's market share. In order to remain competitive, the Bank needs to continually review and improve on digital offerings as well as provide relevant deposit, loan and ancillary products with exceptional customer service.

In order to stay competitive through expanded locations as well as enhanced products and services, we need a technology infrastructure that will support a myriad of software platforms to support these activities. Additionally, a robust technology infrastructure is needed to provide cyber security over our network and systems as well as support the various departments within the bank to gain efficiencies and provide superior customer service.

The largest system the Bank maintains is the core banking system through Jack Henry & Associates (JHA). Core bank processing can be performed in-house or it can be performed on an outsourced platform. Currently, the Bank's core bank processing is performed in-house. To process in-house, there needs to be experts on staff to manage the data center operations, a secondary back-up site and significant investments in infrastructure. If the Bank were to convert to JHA's outsourced solution, it would free up technology staff, decrease capital investment in AS400-related infrastructure and provide access to cyber security professionals. This would support the bank in fulfilling its strategic goals of expanding locations, maintaining robust cyber security oversight of the Bank's technology infrastructure, and supporting software platforms that enhance operational efficiencies and deliver competitive digital products.

Introduction/Background

Bank History

"The Bank" is a Vermont state chartered commercial bank with assets of \$800 million. The bank has served Lamoille County and the surrounding towns since 1891 and is a wholly owned subsidiary of "The Bankshares", Inc., which was formed in 1982. "The Bankshares", Inc. is a publicly traded company listed on the NASDAQ.

Over the past 30 years, "The Bank" has expanded out of the Lamoille County area by opening de novo branches and Loan Production Offices in adjacent market areas as well as through acquisitions. Over this time period, "The Bank" opened six new branches and five Loan Production Offices (three were converted to branches, one closed and one remains open). In 1999, "The Bank" shares, Inc. acquired "The Bank 2" with its four branches located in neighboring Caledonia County, and in 2011 "The Bank" acquired three branches of "the Bank 3" located in northern New Hampshire. "The Bank" currently has 15 retail branches and one loan production office in north-central Vermont, and five retail branches and one loan production office in north-western New Hampshire¹.

Lamoille and Caledonia Counties, like most of the Bank's market area, consist of smaller rural communities. The Bank holds the largest market share in deposits (58%) in Lamoille

¹ "The Bank" Website, About Us, History. www.unionbankvt.com (Accessed 9/21/19)

County where the Bank began, followed by Caledonia County (23%)². In recent years the Bank has expanded into two of the three counties located in Vermont's only metropolitan statistical area (MSA); Chittenden and Franklin Counties. The move into these counties was part of the Bank's strategic plan to enter the State's largest growth markets to attract new customers and businesses as rural communities in the Bank's market area as well as northern New England overall are suffering from stagnant economic growth and a decreasing population³.

U.S. Deposit Market Share Summary Report

Union Bank

Market	Company Total Active Branches 2019	Company Total Deposits 2019 (\$000)	Company Total Deposit Market Share 2019 (%)	Market Total Active Branches 2019	Market Total Deposits 2019 (\$000)
Lamoille, VT	5	371,725	58.25	11	638,131
Caledonia, VT	5	143,896	22.51	14	639,271
Grafton, NH	4	70,209	2.37	55	2,957,041
Franklin, VT	2	40,581	6.28	18	646,305
Coos, NH	1	18,813	3.09	13	609,073
Washington, VT	1	9,204	0.53	23	1,743,910
Chittenden, VT	2	1,736	0.04	51	4,573,609
Total	20	656,164	5.56	185	11,807,340

Figure 1: "The Bank" market share in Vermont and New Hampshire Q3 2019.

The Bank has seven main commercial bank competitors in our service area including three large banks domiciled outside of Vermont and New Hampshire; TD Bank NA, People's United Bank NA, and Community Bank NA, and four community banks within Vermont and

² SNL Analytics (S&P Global Intelligence) Depository market share analysis compiled in Q3 2019. (www.snl.com)

³U.S. Census Bureau; QuickFacts. Population Estimates July 1, 2018. <https://www.census.gov/quickfacts/fact/table/grandislecountyvermont,franklincountyvermont,chittendencountyvermont,vt/PST045218> Accessed 10/18/19

New Hampshire; Passumpsic Savings Bank, Community National Bank, Woodsville Guaranty Bank and Peoples Trust Company. The Bank also has competition from credit unions, and non-bank financial institutions⁴. Two of the largest credit unions, North Country Federal Credit Union and Vermont State Employee's Credit Union, have a presence in many of the Bank's Vermont market areas, and offer highly competitive rates for deposits that the Bank has a difficult time matching.⁵

Historically, the Bank has been very profitable and management strongly believes that this is integral in remaining an independent bank. To sustain a high profit margin, management has focused on measured growth, solid loan underwriting, price discipline, niche services and cost containment. "The Bank"'s primary business is loan origination and servicing with a significant focus on commercial and real estate lending. Commercial and real estate loans make up 70% of the Bank's total assets at December 31, 2018, and loan growth in these categories was 7.5% year over year. The Bank's success in attracting loans, both commercial and real estate loans, is due to offering a wide variety of loan products, knowledgeable lenders, excellent customer service, and fast turnaround times. The Bank strives to maintain a net interest margin over 4% and has been successful even in this low and uncertain interest rate environment. With the benefit of a strong asset liability management process, good pricing strategy and discipline

⁴ "The Bank" Strategic Plan 4-2017. Internal Document.

⁵ SNL Analytics (S&P Global Intelligence) Deposit Rate Ranking Report 10/12/19. (www.snl.com)

on both the loan and deposit side, the Bank's net interest margin was 4.06% in 2018 and 4.02% through 6 months of 2019 compared to a peer of 3.86% and 3.85%, respectively.⁶

In addition to offering commercial and real estate lending, the Bank offers an array of deposit products as well as electronic banking services. In 2016, management determined that the Bank's online services were lagging competitors, and underwent a review of the E-banking program. As a result, the Bank moved E-banking platforms and now offers online banking, bill pay, P2P, external transfers, remote deposit capture and mobile banking. The Bank also has cash management services and offers merchant services.

⁶ FFIEC Uniform Bank Performance Report. "The Bank" 12/31/18, 12/31/17. www.ffiec.gov (Accessed 9/15/19)

Strategy/Implementation

Overview of Project

The banking industry relies on a core banking system to process information and transactions as well as integrate with solutions that allow them to keep pace with rapidly evolving market and technology changes. "The Bank" has used the core banking processing system, SilverLake Systems, from Jack Henry & Associates, Inc (JHA) for over 20 years. JHA was founded in 1976 to provide banks with off-the-shelf banking software and is a leading provider of integrated technology platforms banks use to process financial transactions, automate business processes and manage mission-critical customer and business information. The JHA SilverLake core system holds the Bank's main customer information as well as the loan, deposit and general ledger data. The Bank also has several of JHA's integrated complementary products and services that include collections, workflow, document imaging, and security monitoring, to name a few. Additionally, the Bank has partnered with other third-party providers to deliver ancillary services that integrate with the JHA core banking system through JHA's middleware program, jXchange. Some of the major services include online banking, ATM and debit card processing and Bank Secrecy Act (BSA) monitoring.⁷

The JHA Silverlake System can be processed in-house or can be outsourced through JHA's Outlink Processing Services. Currently, "The Bank" is an in-house processing shop, and the focus of my Capstone project is to evaluate whether the Bank should continue to process in-

⁷ Jack Henry & Associates, Banking Core Solutions. <https://www.jackhenrybanking.com/core-solutions/pages/default.aspx> (Accessed 10/3/19)

house or to outsource through the JHA Outlink Processing Service. There has been a trend in the banking industry to move away from in-house core processing systems to outsourced platforms, and virtually all of JHA's new bank customers opt to outsource through JHA's Outlink service, the exception being new banks that are part of an acquisition who's lead bank is currently using JHA's in-house core processing system. In 2018, JHA on-boarded 38 new customers, of which 37 are processing through JHA Outlink while only one converted to JHA's in-house platform.⁸

Project Objectives

The principal opportunities the Bank is hoping to realize by moving from the current in-house processing system to JHA's Outlink outsourced solution is to reduce capital expenditures related to the AS400 iSeries, redeploy information technology staff to support new technologies and electronic delivery systems, and facilitate growth initiatives. Another component is to have expanded access to industry experts, including cybersecurity professionals. These opportunities are expected to support our strategic goals to grow the Bank through new locations and niche products, provide systems to make our employees more efficient, and ensure customer and bank data is secure.

In-house processing solutions require a significant investment in infrastructure and resident experts on staff to manage the data center operations. Long-term capacity planning and ongoing hardware upgrades are also needed to ensure the Bank maintains a secure and efficient in-house processing environment. JHA emphasizes that their outsourced solution leverages their

⁸ Medlin, Christopher. Customer Relationship Manager, Jack Henry Banking, Monett, Mo. Email 10/8/19.

larger infrastructure and processing environment to eliminate a bank's need for significant capital expenditures as well as alleviate much of the day to day duties of the information technology staff while also allowing access to experts in industry, technology and security. JHA also touts that their outsourced solutions enable banks to be in a better position to take advantage of opportunities by supporting the latest digital products and services as well as allowing banks to take advantage of growth prospects through branching and acquisitions.⁹

There are several components to evaluating whether moving to JHA's outsourced solution will benefit "The Bank". Particularly, what will the effects be to our technology infrastructure and the management of our core processing? Will moving to an outsourced solution reduce the time allotted to day to day duties on our staff, and will we be able to redeploy our resources? Is the transference of control over processing from in-house staff to our outsourced partner beneficial? Is outsourcing the core processing system cost-effective? Will the Bank be more agile and able to provide digital banking services, open new branch locations and act upon acquisitions timelier by using JHA's Outlink servicing platform and having more access to technical experts? All of these areas need to be assessed to determine if "The Bank" will realize the benefits marketed by moving from the current in-house processing system to JHA's outsourced solution.

⁹ Jack Henry & Associates, JHA OutLink Processing Services (JHA OPS)
<https://www.jackhenrybanking.com/core-solutions/pages/jha-outlink-processing-services.aspx>

(Accessed 10/3/19)

Project Role

My role in this project is to make a recommendation to the Information Technology Steering Committee on whether to move from JHA's in-house processing platform to JHA's outsourced solution. To formulate my proposal, I will research the advantages and disadvantages of moving to JHA's outsourced solution, Outlink, from both a financial and non-financial perspective. There are many differences in procedures between processing in-house and having an outsourced platform. These distinctions need to be identified to determine the effects on daily duties, ongoing maintenance, upgrades, patches, unexpected technical issues and cybersecurity. These changes have the biggest impact on the Information Technology department, but may also affect duties in other functional areas such as Deposit Operation's check and image processing. Another area to be explored is how we will convert systems with third parties that are currently providing products and services that are connected to JHA SilverLake, and if there will be any differences in services or bank staff responsibilities as a result. Also of importance is a focus on the cost of in-house processing versus an outsourced platform. This review is to include a price comparison of JHA's two processing options, identifying which services the Bank now engages that will no longer be needed if we move to an outsourced platform, the degree in which we can decrease our capital and technology infrastructure investment, and identifying any reductions or reallocations of staff. To accomplish this analysis, I will confer with the Information Technology Manager (IT Manager) as well as other internal resources, utilize our JHA Relationship Manager, review and compare current contracts with a proposal received from JHA in 2016 for outsourced processing and leverage other JHA customers who have made the conversion.

The IT Manager is in charge of a six-member technology department. The IT Manager has been with the bank since 2002 and in his manager role for the majority of this time. He has a vested interest in the project and has the most knowledge of our information technology infrastructure. His expertise will be relied upon to assess anticipated changes in procedures and processes, determine the impact to the technology staff and ancillary personnel, and the effect on equipment needs as well as maintenance and monitoring contracts.

Another resource is our JHA Relationship Manager. He is in charge of 32 banks that utilize a JHA core banking solution, and of the 32 banks our Relationship Manager oversees, 29 use JHA's Outlink outsourced solution while 3 process in-house. The Relationship Manager is able to provide pertinent information on the differences of processing in-house versus using JHA's outsourced solution for certain procedures and under various scenarios. This is imperative in order to determine the activities and processes that we currently perform at the bank that will remain, and which tasks will be completed by JHA personnel. Another resource afforded by the Relationship Manager is to provide other bank contacts that have made the conversion from JHA's in-house processing solution.

Conversing with bank's that have made the decision to move from JHA's in-house solution and have converted to JHA's outsourced platform is an integral part of the due diligence process. The main considerations include determining why the bank decided to outsource their processing to see if it aligns with "The Bank"'s objectives and discussing the conversion process, including any difficulties that arose with transferring the third-party complementary products and services. Other factors to explore are the quality of support JHA provided

throughout the project, effects on custom integration, and what went well and what did not. This information will afford a good basis to self-assess on the benefits of undertaking this project.

Overall Strategy

Technology is an important component for the Bank to attain its strategic goals as more processes are being automated and electronic delivery channels are expanding. The Bank relies on technology to accomplish its strategic vision. The Bank's strategic goals include supporting new locations, providing innovation in loan and deposit products, broadening access to services and products through the use of electronic applications and other means, maintaining up-to-date information security and customer privacy, and providing systems for employees to efficiently perform their duties. The Bank requires a strong technology infrastructure and department to allow for the timely implementation of projects and initiatives to support the Bank's strategic goals.

Over the past several years, competition in the banking industry from fin-techs and other non-bank financial institutions has increased. Customers are demanding more flexible products and quicker turn-around times and expect the option to interact on-line. To remain relevant and compete in the new age of technology, "The Bank" must continue to reinvent our products and delivery channels and provide tools to increase process efficiencies in our support departments. Increasingly important is to ensure that we have a robust infrastructure and security posture to support these initiatives. Management is committed to implementing new technologies to accomplish these goals. In the past two years, management has made significant investments in new technologies. These projects have directly improved the customer-delivery of our products

and services, enhanced internal processes and procedures, and upgraded our information technology infrastructure.

Two projects with the biggest customer service impact were upgrading our on-line banking platform and offering on-line mortgage applications. In 2016, management reviewed the Bank's digital offerings and identified weaknesses in relation to our local competition. The biggest disadvantage was our on-line banking platform, which had several shortfalls in functionality. "The Bank" was on JHA's on-line digital platform NetTeller, and the decision was made to consider other digital banking platforms. To accomplish this, management started by exploring three other digital banking providers, one of which, COCC, only provided their digital banking platform to customers who used their core banking system. The digital banking product from COCC was considered a front runner, so the digital banking review was then expanded to include a core bank processing analysis. Management performed due diligence on three core banking providers, COCC, FiServ and JHA. In the process, it was discovered that COCC only provided outsourced core bank processing services, so proposals from FiServ and JHA included both in-house processing solutions as well as outsourced services. After a long due diligence process that included tough discussions about JHA's strategic direction with their core bank processing software and ancillary products, the decision to stay with JHA for our in-house core processing system and move to Q2's digital banking platform was made. In 2018 we converted to Q2, and the change in our on-line banking platform has allowed us to offer P2P, external transfers, on-line wires and enhanced mobile functionality. This has been well received and customers have embraced the new technology and features. At the same time, we also saw opportunities to enhance our mortgage business by offering customers the convenience of applying

for mortgages on-line. To facilitate receiving on-line mortgage applications, we installed Webcaster, which both provided better customer service and increased efficiencies by automating the application process. We further improved productivity by upgrading both our mortgage and commercial loan origination systems to better manage the loan processes. There have been several other initiatives to upgrade systems and automate processes over the years, and we continue to review our internal practices and procedures to ensure they align with our strategic goals.

Another important component to achieve our strategic goals is the investment in our technology infrastructure and security systems. In order to facilitate providing new delivery channels for our products, and implementing new software solutions to increase productivity, we need a robust information technology architecture with the capacity to support our systems as well as have industry standard security to ensure our data is protected. To this end, we maintain our primary data center at our main office with an alternate data center located at one of our branch locations. Network administration is performed internally by the information security staff. Firewalls are used to manage and segment network traffic, provide intrusion detection/prevention services and web content filtering. In addition, the bank engages a managed security firm for external facing intrusion detection/prevention services and monitoring of some critical servers. The network also has antivirus and host-based intrusion detection and prevention services for workstations and servers.¹⁰ We continuously invest in our technology infrastructure to ensure our systems can support the bank and provide sufficient security over

¹⁰ 10-D Security, Overland Park, KS. "The Bank" Independent IT Audit Report. Date of Report October 5, 2018

systems. If we move from an in-house solution to JHA's Outlink outsourced platform, we expect a significant decrease in our capital investment in technology equipment related to the AS400 iSeries.

Equally important to having a sufficient technology infrastructure is to have knowledgeable and sufficient technology personnel on staff to maintain and monitor the network. The Bank has a limited number of information technology staff, and historically it has been difficult recruiting highly technical employees to our rural market area. Outsourcing the core banking processing is expected to alleviate the information technology staff of a number of daily duties as well as the ongoing monitoring and maintenance of the AS400 iSeries. This should allow more time for information technology staff to devote to projects and other department's technology needs that support the bank's mission.

Future Opportunities

When the Bank performed the core bank processing analysis in 2017, management did not perform an in-depth analysis on whether to move from JHA's in-house processing system to their Outlink outsourced services due to the large difference in costs based on JHA's 2016 proposal. Since this time, there have been several discussions on whether we should reconsider moving to an outsourced solution and explore the opportunities an outsourced solution may present. Some strategic advantages the Bank would like to realize include gaining business agility, enhanced cybersecurity and information technology as well as gaining access to technology experts. The expectation is that an outsourced solution will improve banking agility by allowing better integration, flexibility in staffing and reducing unplanned capital purchases.

This would allow the Bank to be responsive to strategic initiatives such as digital banking, acquisitions, new branch openings, new software features and functions, taking banking to our customers and allowing employees to work anywhere. This is increasingly important with competition from both financial and non-financial companies.

Cybersecurity is one of the top security risks in industry today with the rapid digitization of consumers' lives and records. Financial institutions top concerns that relate to the use of cloud services include the security of cloud service providers, customer privacy and the exposure of data on the open internet. Data breaches are expected to hit \$6.1 trillion globally by 2021. JHA's Outlink solution is hosted in JHA's private cloud which allows the bank to take advantage of their proactive information technology infrastructure, management, monitoring, reporting and maintenance. JHA's infrastructure provides disaster avoidance and helps mitigate cybersecurity risk.¹¹

Outsourcing our core processing with JHA Outlink would provide us access to information technology expertise, which is important in this tight employment market. Vermont has had one of the lowest unemployment rates in the country, and in September 2019 had the lowest rate at 2.2% while New Hampshire was tied for the third lowest unemployment rate at 2.5%. This compares to the national unemployment rate of 3.5%. Further, the technology industry unemployment rate was 1.9% in April 2019. This has caused staffing and retention issues in technology and banking specialized areas and can lead to information technology staff

¹¹ Jack Henry Annual Conference. Presentation slide deck: Hosted Network Solutions (HNS): Five Years Later.

getting overwhelmed with daily operations. Failure to provide sufficient information technology staffing can lead to disruption in services, inability to fulfill strategic initiatives and heightened regulatory scrutiny. By outsourcing, we can augment our information technology expertise with JHA certified and experienced engineers.¹²

Implementation

"The Bank" maintains a fully equipped environmentally controlled data center where the AS400 resides at the main office and a back-up site at one of our branch locations. Both locations have an AS400 server. The AS400 servers were purchased in January 2016 with a depreciated life of 3-years and expected useful life of 5-years or more. A decision to move from the current in-house processing system to JHA's outsourced solution needs to align with the life expectancy of the resident equipment, which is around 2021. Further, there needs to be sufficient lead time to make the requisite changes to facilitate moving to an outsourced solution. Not only would the core banking processing procedures need to change, but also the integrated complementary products and services that work with the JHA SilverLake system. The ancillary services provided by various third-party firms that integrate with the SilverLake system also need to be taken into account.

It is expected that a decision on whether to move to an outsourced platform for the current in-house processing system needs to be made in 2020 in order to have sufficient time to

¹² U.S. Bureau of Labor Statistics. Subjects: Local Area Unemployment Statistics. <https://www.bls.gov/web/laus/lausthl.htm> (Accessed 10/24/19)

start the contract negotiation and plan for the conversion. The conversion from JHA's in-house processing to their outsourced platform is expected to take nine months to one year.¹³

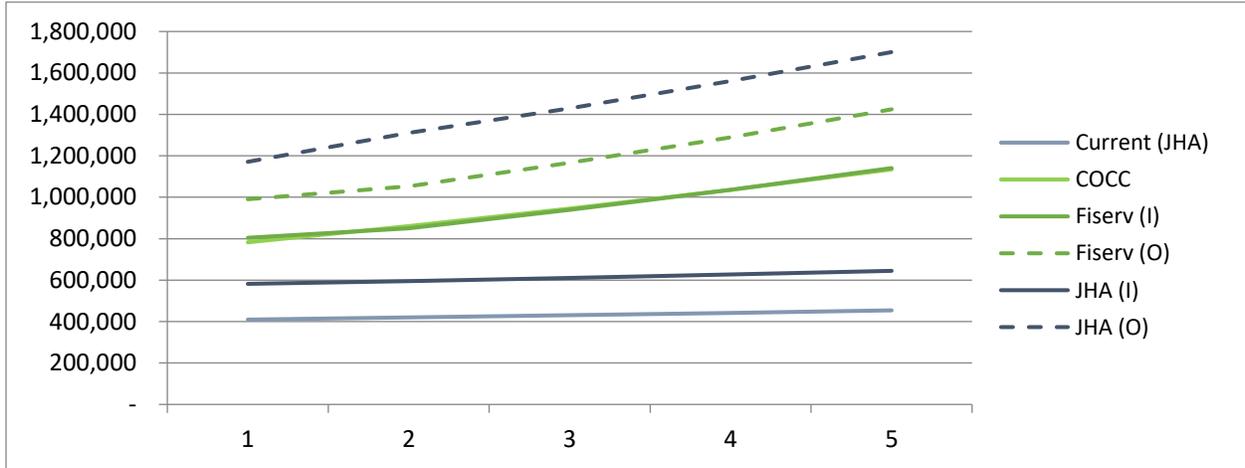
¹³ Medlin, Chris, Relationship Manager, Jack Henry & Association Monet, Missouri. Email 10/23/19

Financial Impact

To analyze the financial impact of moving to JHA's Outlink outsourced core banking solution, we need to consider not only the contract price differential between hosting the system in-house versus outsourcing, but also take into account the difference in the infrastructure needed and the staff required to maintain and operate the system. Based on industry commentaries, there was an expectation that the contract price for an outsourced solution would be significantly higher than hosting the core banking system in-house. This was validated during our due diligence process when we performed our core banking review. At that time, the difference in costs for the proposal received in 2016 between JHA's in-house solution versus their outsourcing service was appreciably higher, which was also evident in the other core banking provider's proposals. Due to the high cost differential in JHA's solutions, the decision was made at that time to remain processing in-house without further research into other costs savings that could partially off-set the increase, or considering any non-financial advantages the bank could realize using an outsourced core banking model.¹⁴

¹⁴ "The Bank" 2017 Internal document; 2017 Core analysis and recommendation

2016 Pricing Proposals– Bank Processing Solutions



Core Processing Solutions - Annual Cost					
	Year 1	Year 2	Year 3	Year 4	Year 5
Current (JHA)	409,477	419,448	430,173	441,708	454,119
COCC	782,715	860,725	945,503	1,036,568	1,134,406
Fiserv (I)	804,422	850,467	939,126	1,035,757	1,141,031
Fiserv (O)	990,553	1,052,288	1,165,805	1,289,573	1,424,457
JHA (I)	582,135	595,945	610,861	627,400	644,818
JHA (O)	1,171,199	1,310,977	1,428,826	1,561,242	1,700,708

The financial analysis used to determine if we should continue our due diligence for moving to JHA’s Outlink outsourced service is based on the 2016 JHA proposal received during the previous core banking review. The analysis has been adjusted to consider our current products and services as the JHA proposal included a cadre of products and services that we did not contract for. Additionally, the prior proposal included ancillary products that we currently host in-house which we are not contemplating outsourcing. Since the 2016 JHA core banking

and ancillary product proposal, we have added some products and services to include their report writing system, enhanced collections module, upgraded teller program, workflow module and some add-on features, and there are several JHA products that we still do not have such as their customer relationship management system, telephone banking, electronic funds transfer services, Bank Secrecy Act / Anti-Monetary Laundering monitoring, on-line banking platform and deposit origination system, to name a few.

The pricing structure for JHA's core bank processing and ancillary bank services are broken down by annual maintenance costs and monthly processing fees. Also included are implementation costs for converting from an in-house system to their outsourced solution. Additionally, the pricing is categorized into 12 distinct products and services; Core Account Processing, JHA Complimentary Products, Retail/Branch, Risk/Fraud & Compliance, Online Banking, EFT Services, Document Management/Report Writer, Customer Relationship Management, Telephone Banking, Item Processing / Statement & Notices, Network and Third-Party Interfaces. The largest cost component for an in-house system relates to annual maintenance fees for the various products and services followed by monthly processing fees while the outsourced services fee structure is the opposite, with the highest charges related to monthly processing fees.

The cost for JHA's in-house solution as well as their outsourced services were assessed over a 5-year time period, only including the products and services the bank is currently using. Costs are based on a 3% increase in both the annual maintenance and processing fees. The year one cost to move to and process for the year on JHA Outlink outsourced solution was \$772

thousand and included \$61,640 in professional fees. The cost in year two dropped to \$739 thousand before increasing by 4-5% the next two years and 8% in the final year to stand at \$875 million. In comparison, JHA's in-house solution did not contain any conversion costs in year one and the fee was \$358 thousand the first year and increased by 4% the following three years. The fee in year five was \$423 thousand.

JHA Core Processing Costs by Product; In-House versus Outsourcing

Monthly Cost by Product or Service					
Outlink Outsourced Services					
Year:	1	2	3	4	5
Core Account Processing	37,533	39,058	40,647	42,298	44,010
Retail/Branch	4,800	5,122	5,470	5,847	8,662
Item Processing / Statements & Notices	7,114	7,682	8,295	8,958	9,675
Network	750	750	750	750	750
Third Party Interfaces	2,273	1,983	2,171	2,209	2,247
Total Monthly Costs	52,470	54,594	57,333	60,062	65,343
Annualized	629,642	655,134	688,001	720,740	784,113
JHA (O) Annual Maintenance	81,015	83,445	85,949	88,527	91,183
Professional Fees	61,640				
Total Annual Costs	772,297	738,579	773,950	809,267	875,296
% Increase / (Decrease)		-5%	5%	4%	8%

Monthly Cost by Product or Service					
In-House Solution					
	1	2	3	4	5
Core Account Processing	-	-	-	-	-
Retail/Branch	-	-	-	-	-
Item Processing / Statements & Notices	7,114	7,682	8,295	8,958	9,675
Network	450	462	474	487	500
Third Party Interfaces	-	-	-	-	-
Total	7,564	8,144	8,769	9,445	10,175
Annualized	90,772	97,725	105,233	113,341	122,098
JHA (I) Annual Maintenance	267,530	275,556	283,823	292,337	301,107
Total Annual Costs	358,302	373,281	389,056	405,679	423,205
% Increase / (Decrease)		4%	4%	4%	4%

The price for core bank processing services is the largest cost component in considering the overall fee for processing. However, the cost of the servers, maintenance fees and labor also need to be factored into the assessment. "The Bank" maintains two AS400 iSeries servers, one

at the main data center and one at the secondary recovery data site. The AS400 iSeries have been fully depreciated and are nearing their useful life. When we last replaced the servers, the cost was approximately \$135,300 for two servers, and this is the cost used in the analysis. Further, we need to have a maintenance agreement on the servers, which is an additional \$50,000 over three years or \$16,667 per year. We would not expect any other savings from our secondary recovery data site as this facility needs to be maintained to house our back-up network infrastructure. We also maintain database servers for ancillary products such as our document imaging system and our BSA / AML fraud detection program, which we would continue to require so we do not expect savings on these services if we were to move to an outsourced solution.¹⁵

There is an expectation that there will be a shift of a number of daily duties associated with a conversion to an outsourced solution as well as some various system maintenance responsibilities. If we were to use JHA's Outlink outsourced services, we would expect to reduce the needed IT hours related to the AS400 core processing by three quarters to one full staff person. These duties will be expanded upon in the non-financial analysis. Although we would not realize the savings in direct expenses as we would redeploy IT staff duties to other strategic projects, the staff savings are accounted for in real dollars in this analysis.¹⁶

The annual savings expected to be realized by converting from our core banking processing in-house is to come from not having to replace the two AS400 servers, discontinuing

¹⁵ Goodhue, Don, VP – IT Manager, "The Bank". Personal conversations December 2019

¹⁶ Bousquet, Thomas, IT Applications Specialist, "The Bank". Personal conversation 12/17/19

the maintenance contracts on the two AS400 servers and a reduction in IT staff. The two AS400 servers are depreciated over three years with a useful life of five years. Therefore, the analysis shows a cost of \$123,000 spread over years one through three. The maintenance contracts are projected to remain the same and the IT staff salary is calculated with a 3% increase annually. Based on these assumptions, the annual savings from moving to JHA’s outsourced platform is around \$114 - \$118 thousand the first three years and around \$78 - \$80 thousand in year four and five.

JHA Core Processing Savings; In-House versus Outsourcing

Annual Savings: Outsourced Solution					
Year:	1	2	3	4	5
2 AS400 Servers	42,000	42,000	42,000		
AS400 Mainenance Contracts	16,667	16,667	16,667	16,667	16,667
IT Staff	56,000	57,680	59,410	61,193	63,028
Total	114,667	116,347	118,077	77,859	79,695

Even taking into consideration the savings expected to be realized, there is a significant difference in costs between JHA’s in-house core banking solution and JHA’s Outlink outsourced services. In year one, the cost for JHA’s in-house solution is \$358 thousand versus a cost of \$658 thousand for outsourcing the core banking processing, which considers the annual savings outlined above and includes one-time conversion-related professional fees of \$61 thousand. This cost does not include the time in-house staff will need to dedicate to the transition. The cost gap in years two and three fall, but go up again in year four and five due to the AS400 servers being fully depreciated. In year two, which has the lowest cost gap, the price of outsourcing is \$249 thousand, about 67% higher than continuing to process in-house. Per the UBPR, income through

the first 9 months of 2019 is \$8.2 million, and is \$10.9 million on an annual basis. The increase in core banking processing if we moved to JHA’s outsourced solution, based on 2019 annualized income, would impact the bank’s earnings by 275 basis points in the first year and 228 basis points in the second year. Based solely on a financial analysis, I would not recommend moving to JHA’s Outlink outsourced solution. However, outsourcing provides non-financial benefits which need to be assessed to determine if their value outweighs the large incremental cost increase from outsourcing.

JHA Core Processing Comparison; In-House versus Outsourcing

JHA: Annual Core Banking Processing Cost; In-House versus Outsourcing					
Year:	1	2	3	4	5
JHA (I)	358,302	373,281	389,056	405,679	423,205
JHA (O)	657,630	622,233	655,873	731,408	795,601
Difference	299,329	248,952	266,817	325,729	372,396
% Increase / (Decrease)	84%	67%	69%	80%	88%
2019 Annualized income	10,900,000	10,900,000	10,900,000	10,900,000	10,900,000
Cost Difference as % of Net Income	2.75%	2.28%	2.45%	2.99%	3.42%
<i>JHA (O) Year 1 includes \$61,640 in implemetation/converstion costs</i>					
<i>JHA (O) Annual costs take into consideration expected annual saving</i>					
<i>2019 Annualized income based on first 9 months of results per the UBPR</i>					

Non-Financial Impact

Evaluation of Organizational Hurdles

The biggest resistance to converting to an outsourced core processing service is the cost. The additional fees to use JHA's Outlink outsourced processing solution versus processing in-house is significant, even considering the savings expected to be realized by reducing the required investment in infrastructure and systems, and decreasing staff responsibilities. "The Bank" is a stock bank and financial results are scrutinized closely. It is expected that 2020 will be a difficult year as non-interest expense is expected to increase significantly due to branch expansion while growing interest income will be challenging in this interest rate environment. "The Bank" opened one branch during 2018 and two branches and a Loan Production Office in 2019. The branches have been successful, but have not yet grown sufficiently to absorb the increased expenses. In 2020, non-interest expense will have a full year of depreciation as well as salaries & benefits and ancillary expenses related to the new locations. The impact of these costs are expected to have a meaningful impact on this line item. At the same time, net interest margins are under pressure due to a challenging interest rate environment. Borrowers expect lower rates on their loans as they saw the Federal Reserve cut interest rates three times in 2019, while depositors have renewed interest in the interest rates paid on their deposits since 2018 when the interest rates rose four times. The pressure from both sides of the balance sheet has squeezed interest rate margins and this is expected to continue into 2020.

Another anticipated barrier is the staff time it will take to convert from our in-house system to JHA's Outlink service. The conversion process includes gathering a multitude of

information and a sizable amount of testing along with project planning and oversight. These duties will fall on many of the Bank's busiest staff members that are relied upon for ongoing daily duties and implementing new IT projects. The Bank's IT strategic plan supports the Bank's overall strategic mission and focuses on projects to increase efficiencies, improve the delivery of products and services to our customers, improve infrastructure and security, and provide technology training for staff. We have a long list of IT projects in 2020 and 2021 to support these goals, and performing a core banking conversion will compete with other projects on the project list due to the set capacity of our staff resources. Management will need to determine if converting to an outsourced core banking solution is a good use of staff resources and aligns with the bank's strategic emphasis, or if other projects will more meaningfully fulfill the vision of the bank.

A further concern expressed by management is losing control over our customer data and being tied to one core banking vendor. Consumers expect a truly digital experience and we must evolve with their expectations. Most existing core processing systems, including JHA, provide a number of platforms for lending and deposit-taking activities. However, these platforms use differing data standards and often do not interact with one another, nor solutions from other companies. "The Bank" needs to ensure that we will be ready to take advantage of expected next-generation core service providers that offer end-to-end digital banking experiences and continuously develop innovative solutions for their clients. Successful next-generation core service providers will be able to allow institutions to develop their own technology or partner with fintechs while providing flexible access to data on their core systems.¹⁷ Currently, there are

¹⁷ McWilliams, Jelena, FDIC Chairman, Speech "The Future of Banking", October 1, 2019,

three major core bank processing companies that provide similar services, JHA, Fiserv and FIS. Will these companies, and specifically JHA, update their legacy systems to support these emerging financial technologies that may reshape the financial services industry over the next decade. If we outsource our core bank processing, would it be more difficult to move to another core provider in subsequent years? Management wants to be in a position to take advantage of advancements in technology to stay competitive. One facet required to do this is to have the ability to change core providers to allow us to be in a better position to use new technologies and not be constrained long-term to one vendor that may be utilizing legacy systems.¹⁸ Additionally, if we moved to JHA's Outlink outsourced solution, we would no longer house our customer data. We may lose some flexibility with regard to accessing our customer data as all of our vendors would need to connect to our data through JHA.

Also, with our customer data housed at JHA's data centers, we would be reliant on JHA to notify us in the event of any incidents or security issues with our customer data. JHA has stated that they have experts in industry and cyber security, and that they have a robust security infrastructure allowed by scales of economy. However, when we have experienced a system issue or outage in the past, there has been a lag time in receiving information. If we were to move to an outsourced solution, there is a concern that there may be a lack of timely

https://www.fdic.gov/news/news/speeches/spoct0119.html?utm_campaign=Newsbytes-20191002&utm_medium=email&utm_source=Eloqua

¹⁸ Gilbert, Ryan, American Banker's Journal, Article, January 10, 2020, 10 fintech forecasts for the 20's, <https://www.americanbanker.com/opinion/10-fintech-forecasts-for-the-20s>

communication if the system were down or in the case of a cyber event. These points need to be discussed as part of the due diligence process, and addressed in the outsourcing contract.

Evaluation of Non-Financial Impact

There are several benefits and concerns in conjunction with moving from JHA's in-house core bank processing platform to their Outlink outsourced solution. As discussed above, some benefits that JHA markets include staffing flexibility, business agility, transferring cyber risk and access to information technology expertise, while areas of concern expressed by bank management include cost, loss of control over customer data and the processing system, conversion resources and increasing the difficulty to move to another core bank processor.

The conversion from processing in-house to an outsourced solution is expected to have a positive impact on the technology staff. The technology department consists of six employees, one of which spends about half of his day on daily duties related to the AS400. A second IT staff member acts as the AS400 back-up while other IT staff members perform various AS400-related duties sporadically. Some daily duties include cutting the ATMs over to night mode, kicking off and monitoring end of day processing, and triaging errors encountered with end of day processing. The nightly processing cannot start until all of the transaction batches from the branches have been reconciled, and is scheduled for 7:00 PM. The AS400 specialist needs to log into the system to be sure that nightly processing has begun, and log in sometime after 8:00 PM to ensure that processing has been completed without error. If there is an end-of-day error, this must be address immediately so that processing can be completed prior to opening the bank the next day in order to avoid disruption in services. Some errors can be addressed internally by IT

staff while others need to be escalated to the JHA support group. Moving to an outsourced solution would remove the need for IT staff to monitor the system each night, and troubleshoot errors, as needed. Other daily duties related to the AS400 that IT staff perform include building reports to ingest into the document imaging system and confirming that the replication system is working on the secondary site.¹⁹ Additional AS400-related responsibilities in the technology area are more sporadic and include evaluating and applying security settings and enhancements to the AS400, upgrading AS400 servers and ancillary equipment, troubleshooting errors and performing failover tests. If "The Bank" were to move to JHA's Outlink outsourced service, the majority of the AS400-related daily duties would be alleviated, which would free up half-a-day for one IT staff member and the equivalent of half-a-day for other members in the IT area that have other AS400-related responsibilities.

The ability to reduce or redeploy a full-time-equivalent IT staff member is very valuable. It is expected that we would redeploy IT resources rather than reduce IT staff based on the time pressures in the IT area. The Bank has implemented many IT-related projects over the past few years, and this is expected to continue into 2020 and beyond. Additional IT resources will help the Bank fulfill its strategic mission to provide cutting edge products to our customers as well as allow us to provide innovative systems that enable our staff to be more efficient. The IT staff time commitment for converting from in-house processing to the Outlink outsourced solution can be mitigated by having a strong project team working in conjunction with JHA's conversion team.²⁰

¹⁹ Bousquet, Thomas, IT Applications Specialist, "The Bank". Personal conversation 12/17/19

²⁰ Birmingham, Renee, New Hampshire Mutual Bancorp, 12/31/19 email

Along with having the benefit of reallocating IT staff, we would be able to eliminate a possible point of failure by moving to an outsourced core banking solution. The operating system for JHA's core bank processing system is IBM's AS400 iSeries. The majority of the bank's remaining network infrastructure uses Microsoft as the operating system. The AS400 requires special technical expertise, monitoring and maintenance, and there are fewer technology professionals that are knowledgeable on the iSeries as it is an older technology. We currently have a dedicated information technology staff member that has the expertise in the AS400 iSeries with a back-up for certain AS400 iSeries processes. For the remainder of the network, the maintenance and monitoring can be done through similar processes and automated tools, and there is redundancy within the information technology department. We would be vulnerable if the AS400 specialist were to leave at this time, but this weakness would be alleviated if we outsourced the core banking processing platform²¹. Additionally, we would not need to have an IT staff member assigned to monitor the AS400 each night to ensure that end-of day processing completed properly as this would be performed as part of the outsourcing services provided by JHA specialists.

Another area the bank, like all companies, need to continue to focus on is cyber security. The IT department has automated monitoring and patching tools for the bank's network, but due to the fact that the core bank processing system is on an AS400 iSeries, the security monitoring and patches are deployed and managed differently than the majority of our network. If we moved to JHA's Outlink outsourced solution, the security administration and liability would be

²¹ Goodhue, Don, IT Manager, Morrisville, "The Bank". Personnel Interviews (Various; December/January 2020)

transferred to JHA. This would decrease the time required to oversee the ongoing support of the AS400 iSeries, and provide access to JHA's cyber-security and industry specialist. By outsourcing, we can augment our information technology expertise with JHA certified and experienced engineers, who have the benefit of specializing in monitoring many financial institutions. This makes them uniquely equipped to identify and respond to cyber incidents.

One concern that management has expressed regarding cyber security and the fact that the Bank's non-public personal information would be housed at a JHA data center, is the potential for a lack of transparency and timely notification in the event of an incident. This apprehension is derived from an incident response exercise facilitated by our management security provider. The scenario for the incident included a breach of the bank's core bank processor where information regarding the incident was not readily forthcoming. The managed service provider communicated at the exercise that this scenario was based on a real-life incident. To alleviate these concerns, management should obtain and review JHA's incident response plan and procedures. During the due diligence process management should discuss with JHA their incident response process to take into account reactions to various scenarios as well as notification timelines. Lastly, management should review the contract prior to execution to ensure that the incident response steps and requirements are addressed sufficiently.

Long-Term Impact

The demands in technology departments in all banks are increasing as the majority of projects have an IT component, whether providing customer-facing digital products and services or programs that provide efficiencies for backroom staff. Additionally, there are heightened

expectations from regulators and auditors to ensure that computer networks and systems have robust security structures and monitoring in place. This is especially true as banks approach and exceed \$1 billion dollars, and the Bank has experienced this transformation over the past few years. The move to an outsourced core banking solution is not expected to improve profitability as the cost to outsource is higher than to remain processing in-house. However, it is anticipated that a conversion to outsourcing will afford the IT staff more time to ensure that the Bank's computer systems and processes are in line with security best practices to mitigate cyber risk and satisfy regulator expectations. This will create a stronger IT infrastructure that will be better prepared to support projects that fulfill strategic goals such as improving digital delivery of products and services to our customers and promoting back-room efficiencies.

Conclusion

The biggest resistance to converting from an in-house core processing system to an outsourced solution is the cost. Although there are staffing and capital cost savings, these do not defray the increase in the contract price. There are several intangible benefits, and I believe that these benefits are worth the cost. The ability to redeploy staff, eliminate a possible point of failure, transfer liability and have access to cyber and industry specialist are valuable business standpoints, while concerns related to housing our customer data off-site can be addressed through contract negotiations. I recommend that management obtain a current proposal from JHA, and move forward with negotiations to convert to their Outlink outsourced solution.

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