Financial Services Operational Excellence through IT Automation
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I. Executive Overview
The financial services industry is confronted with many challenges: increasing regulatory requirements, growing client information needs, mobile commerce, securing customer data, integrating new and existing IT infrastructure, and the demand for more accurate predictive analytics. Factor in an erratic economy and it is obvious that public and private banks, stock exchanges, insurance companies, government financing bodies, and asset management firms operate in a highly volatile environment.

Faced with these demands, financial services companies have been moving all their IT operations into the strategic heart of the business. IT Operations is no longer thought of simply in terms of data storage and processing speed, but instead is commonly viewed as a way to gain strategic advantage.

The growing demands of the financial services business require a fast, reliable IT operation. While they have historically operated in-house developed systems on centrally-located machines, financial institutions now face the prospect of integrating more distributed computing systems into their infrastructure to take advantage of newer applications and Cloud-based services. This requirement is further driven by the impact of expansion and acquisitions.

Achieving this competitive edge is predicated on a fast, reliable IT operation. Financial institutions have historically operated in-house developed systems on centrally-located machines. They now face the prospect of integrating more distributed computing systems into their infrastructure to take advantage of newer applications and Cloud-based services. This requirement is further compounded by corporate expansion and acquisitions. Among the many systems that need to be consolidated are investment product lines, client services, and internal accounting.

Absorbing, analyzing, and acting on information from multiple input streams presents a Big Data challenge for IT Operations. In financial services, IT groups must also have the ability to collect, store, and present detailed transactional information required by increasingly demanding regulators. Securing this vast amount of data -- with zero tolerance for failure and outages -- can be a daunting effort. This task is not made any easier by increasingly distributed infrastructures and applications running on multiple server platforms. Some organizations have sought to simplify their business operations by implementing off-the-shelf software application “suites”. In most instances, there is a continued need to interface with legacy tools, third party applications, and custom-built solutions that serve unique operational demands.

This paper outlines key consideration when automating the many disparate business processes and applications that make up the modern financial services IT infrastructure. Through automation, companies anticipate and manage their inter-application dependencies, and reduce lag times, human error, and overall infrastructure expense. IT operators, in turn, are better able to focus on innovation versus having to decide where to route workload, double-check reports and fix so-called “automated” processes. They gain an overview of the entire system that’s now easy to audit and manage, allowing rapid and painless recovery from any problems or glitches.

The IT automation approach selected needs to be scalable and elastic enough to meet changing processing demands -- allowing IT Operations to leverage the flexibility offered by Cloud-based resources. Since all applications and platforms are automated according to the same rules, businesses can add or subtract IT workload to match the demands of a dynamic banking business without having to rework the entire system.
To address their workload automation requirements, investment and banking institutions are finding that the rigid constraints of master-agent based automation systems are inadequate. Alternatively, an automation solution built on a distributed execution architecture offers the elasticity that organizations require when optimizing resource utilization. Through a distributed automation approach, IT Operations can be responsive to changing business demands -- dialing up or dialing back on processing activities by leveraging on-premises, virtualized, and Cloud-based resources. With a reduced need for expensive hardware, the distributed architecture solution increases IT ROI for banking institutions since it can expand to meet growing business demands without increasing capital expenditures. Benchmarking studies have shown that a distributed IT automation implementation can save 50% in capital equipment expense and reduce operational costs by 30%.

One large bank was able to eliminate 90% of task errors, accelerate root cause problem solving by 75%, and achieve a 40-fold reduction in time-to-repair errors. An insurance company reduced their batch window by 33%, while increasing the number of processes from 1500 to 4000. A stock exchange doubled application performance, reduced the batch window for critical jobs by 50% and significantly increased clearing capacity while reducing overall annual operating costs. A private bank reduced application set-up and deployment time by 80%. A post-trading company saved 40% on scheduling costs.

The IT department is ultimately responsible for integrating the processes, applications, and systems that support the business. This paper identifies the challenges financial services companies face and explores the ideal automation approach to optimize the full value of their IT resources.
II. IT Automation Challenges for Financial Services

The demands on financial service providers have grown exponentially in recent years. Additional requirements from regulatory bodies, margin stress from the economic downturn, and increased competitive pressure in an era of consolidation all weigh heavily on the industry. To successfully operate in this challenging environment, they need a cohesive, robust IT operation. These are the major challenges facing financial companies that can be addressed through enhanced IT performance and automation:

**Integrating Legacy Systems**

Faced with the need for reliability and resiliency, many financial services organizations have relied on powerful mainframe computing systems. Robust, mature, and scalable, mainframes have been the computing workhorses in the finance and banking sectors for decades and continue to be at their core. These powerful machines are now being augmented by servers used to host new banking software and integrated suites that are developed to run on distributed system platforms. The IT organization needs to integrate these solutions with those run on mainframe systems.

**Connecting Functionally Distributed Business**

Most financial services organizations’ IT infrastructures tend to be centralized. This massive amount of computing power presents IT with the challenge of managing functional distribution. Applications supporting various tasks such as CRM, financial risk management, or marketing might be running physically in the same data center, but processing on different computing systems. There are many business advantages to tying these disparate applications back to the core banking system. IT must manage the integration of processing tasks of this distributed infrastructure for the business to operate effectively.

The financial services industry continues to aggressively consolidate. Connecting disparate IT systems following a merger or acquisition further complicates the IT landscape. These applications and systems often continue to run separately, and lack any consolidated visibility of all enterprise activity. Monitoring and managing individual systems manually can be inefficient and time-consuming in such an environment.
Harnessing Big Data
Recent surveys find that more than 90% of finance industry executives consider data management and analysis a major strategic priority. More than a third identified transforming the deluge of available data into intelligent information as their primary initiative in coming years. These financial leaders believe that using data mining to develop predictive scenarios, merge performance and risk analytics, and create comprehensive client personas will give them a definitive competitive edge.

Many institutions are setting up private Clouds to organize, analyze, and manage this data. Cloud computing and virtualization provide the flexibility and scalability necessary to process this vast amount of data while ensuring the security needed to protect sensitive information. In addition to the increased volume of data from multiple input streams, organizations are also adding tools for historical and predictive analytics and risk management analysis.

Distributing the workload and sharing the burden of increased processing demands driven by these Big Data projects presents a growing challenge for IT Operations. Business depends on IT to make quicker, more informed investment and operational decisions while managing costs in a tight budgetary environment.

Optimizing Performance and Resiliency
24x7 system availability and resiliency is critical in the financial services world. In some cases, the IT infrastructure is responsible for processing billions of dollars’ worth of transactions a day. Any type of failure - whether database, network, or application - for even a short period of time can have disastrous effects and result in millions of dollars of loses. Unmatched levels of resilience and availability are the main reasons for such reliance on mainframes. Expanding business services to include more distributed systems-based solutions means IT Operations must focus even more on ensuring reliability.

Establishing private Clouds and increased data management requirements adds another layer of complexity for IT Operations. Organizations employing a hybrid computing infrastructure need to address how they are managing the environment, controlling the consumption of those resources, and securing their data throughout the process. Defining workloads and determining where they can best be run is only part of the challenge when utilizing private Cloud resource. The next important task is regulating consumption through performance monitoring, capacity management, and provisioning. Controlling consumption is crucial to meeting SLA’s and to realizing the cost benefits of using the Cloud.

Responding to the Empowered Client
Investment brokers have increasingly moved from being attached to financial institutions towards becoming independent investment advisors. These independent advisors must adhere to a “fiduciary” standard – recommendations must be in the best interest of the client. Brokers on the other hand are held to a “suitability” standard – recommendations need only be suitable for clients. This shift puts more pressure on financial institutions to be more transparent in sharing information.

Some smaller private banks and financial institutions have responded to this growing client focus by implementing integrated banking applications. These all-inclusive solutions consolidate core services like e-banking, order management, trading, portfolio management, risk management, CRM, performance contribution and attribution. While modernizing systems with an integrated package offers significant advantages, it can also create issues, especially when scheduling jobs. Often these integrated systems will not only have significant back-end processing that needs automating, but they may also have to connect with surrounding banking systems that also have job processing needs. Coordinating these combined scheduling requirements can present IT Operations with extra challenges.
Mobile customer engagement, social media, and better access to information regarding financial instruments and investments have placed the client in the driver’s seat. Clients are demanding better visibility, more detailed information, and improved risk management. Meeting these demands means leveraging IT resources to manage increasingly complicated applications and tasks. Integrating the new systems with core business operations and establishing appropriate controls creates an additional burden for IT Operations.

**Controlling Regulatory Complexity**

Governmental regulatory controls in the banking world continue to grow. IT Operations is responsible for collecting, organizing, and managing the information required to comply with the audit requests. Organizations have to ensure the data captured provides the detail needed to meet ever-changing reporting and compliance mandates. Many jurisdictions have requirements that data be located on premises in the specific location where business is being conducted. Ensuring alignment with these regulations adds more pressure to IT Operations.

Financial services’ IT departments must consider how available tools address these specific challenges. Although individual systems may have some level of automation to manage and control workload demands, they are rarely connected to each other. They have no means to accurately determine what spare capacity might be available to undertake extra processing. To properly control consumption, IT needs to know the capacity of each resource – physical, virtual, and Cloud – and match it to current and future workload.

Servers handle their functional processing tasks in isolation with little to no interaction. Performing end-of-day transactional processing, treasury, close-of-business tasks, and other workload processing are examples of jobs being run separately using a variety of application-resident schedulers. IT Operations is left to connect these islands of automation.

Some of the strategic issues for financial services institutions that result include:

- Operational delays getting necessary business information to users and clients
- Difficulties managing and processing high volume data sets
- Lack of enterprise-wide visibility to IT systems when pinpointing issues
- Inability to provide data needed for various compliance audits
- Failure to realize economies of scale due to high cost of system expansion
- Business impact of network failure or IT outage

These IT challenges grow exponentially as financial service businesses expand and as regulatory and market pressures increase. Without a highly integrated, robust IT automation system, handling workload becomes untenable, costs rise, service levels decline, and risks from system failure or regulatory non-compliance escalates.
III. Choosing the Best Automation Strategy for Financial Services

Depending on the systems and processes in place, there are numerous options that financial services organizations need to consider when developing an automation strategy. What interfaces are available to help integrate and automate post-trade processing? Where are the bottlenecks and delays that impact customer statement generation run times? How can spikes in market activity be managed? Are there files arriving from external providers that need to be handled? Which operating system platforms are IT workloads running on? How can current automation activity be included in the future direction? The beginning of a very long list...

However, there is a fundamental automation choice that all financial services IT departments need to take before answering these questions. Will the automation strategy be based on a master-agent or a distributed architecture?

Master-Agent Architecture

Many of the principles used to manage, monitor, and control computing systems in today’s IT departments are holdovers from when the mainframe ruled all. Heavy duty workload was directed to run where there was plenty of computing power available – in the data center. Remote systems were responsible for scheduling lightweight, local jobs and feeding data required by the corporate systems. The seeds of a master-agent architecture were sown.

Automated operations evolved in a world dominated by a mainframe blueprint. A centralized master was used to configure, manage, and monitor the progress of all workload -- with subordinate agents automating job execution. Many current automation solutions are based on this master-agent architecture.

The master-agent configuration can be an effective approach in a static, structured IT environment that is founded on a homogeneous infrastructure with highly integrated business applications. Initiating, prioritizing, and controlling jobs from a central point can simplify maintenance and save on administration costs. In addition, managing job definitions in a centralized repository can reduce the overhead incurred when deploying database agents on all servers where workload is running.

There are numerous inherent challenges that financial services organizations face in a master-agent architecture, however. As the volume of automated workload increases, so does the pressure on the master scheduler to manage jobs. IT operators need to add masters as the network of distributed servers grows – each running business-critical workload that needs to be automated. Scaling automated operations can prove time consuming and expensive, with the potential need to add infrastructure software as well as base automation components. As can be seen in Figure 1, IT Operations loses visibility and control when it needs to work through multiple masters to submit jobs and troubleshoot issues. A network failure can have a devastating effect when a master requests an agent to schedule a job on a remote server.

Figure 1: Master-agent Automation Lacks Agility and Ability to Scale
Distributed Architecture

Distributed systems computing evolved as a cost effective, scalable alternative to the mainframe. Utilizing a client-server model, business applications deliver the performance, scalability and resilience that enterprises need by distributing IT workload across multiple servers. A distributed architecture simplifies the management of distributed workload. It also empowers users with local access to, and control of, application and processing capacity they need to do their jobs – with no need for connectivity to remote corporate IT systems.

With a distributed architecture, software components are placed on each server in the network to automate and optimize IT workload. Since all servers can communicate with each other, as illustrated in Figure 2, there is no need to check in with a central master for direction on what to do. Process flows that span multiple servers can be event-driven, eliminating latency that might otherwise delay completion of workload. Capacity can be increased in response to surge demands, with the network being used to connect to extra Cloud or on-premises computing resources. With each server being autonomous there is no single point of failure. Also, outages are isolated to individual systems, minimizing any consequential impact.

A distributed architecture is typically better suited to serving the IT automation demands of financial services organizations. Most importantly, it provides the flexibility required to accommodate the rapid change that is the hallmark of the banking and finance industry. Additionally, financial services providers can ensure that any latency in their account update and reporting workload is minimized. They can also improve customer service levels with the timely processing and analysis of charge card transaction data. A distributed architecture also offers unparalleled levels of scalability and resilience – crucial when offering new products and services.

A distributed architecture offers the following benefits to financial services IT operations:

- Faster run times by removing latency using localized event-based communications instead of waiting on master-agent polling
- Real-time performance and capacity metrics used to direct IT workload assures 24x7 availability
- No need for additional hardware or software requirements as business expands, thus reducing ownership costs
- No limits on the number of servers that can be automated, thus ensuring that current and future business needs can be covered with no extra overheads
- Increased agility when resourcing computing capacity on-premises or Cloud IT services
IV. Business Value from Distributed Architecture

The growing demands and increased competition in the financial services industry can clearly stretch the resources of IT organizations. The challenges confronting financial services IT groups increase as enterprises integrate mainframes with newer distributed systems, crunch huge amounts of data, strive to optimize hybrid computing environments, and struggle to achieve regulatory compliance. IT is also under pressure to deliver maximum value and must consider external as well as internal sources when obtaining IT services.

Successful financial institutions need to remain competitive by refining their investment analytics and rigorously controlling their operational costs. The most effective way to achieve those goals is through a streamlined IT operation supported by an automation solution built on a distributed architecture.

Ensure Optimum System Performance

From using automation to provide a flawless “financial close” process service, to supplying the most up-to-date client portfolio reports, IT Operations is responsible for the successful completion of various tasks required by financial institutions. Employing a comprehensive automation solution, IT Operations can help integrate diverse platforms and applications that can accelerate throughput -- while also providing global visibility across the enterprise.

Automation can be used to remove unnecessary manual interventions involving business application workload. By monitoring system performance and processor utilization, workload can be immediately placed on servers where there is available capacity. Setting jobs to be triggered by events can further reduce turnaround times. An IT automation solution will not only automate manual submissions and drive processing based on events, but it will also accelerate throughput across job streams – avoiding the delays incurred when workload needs to be managed by a master. Organizations typically reduce latency by up to 20% with distributed architecture automation.

Workload can be distributed across all servers with the unlimited capacity now available on tap in the Cloud. With each system having its own agent, the constraints that might be imposed by managing the master-agent balance is avoided. As a result, throughput is maximized and jobs complete in less time. Many organizations report that 99.9% of jobs complete on schedule.

Streamline High Volume Data Processing

A distributed architecture IT automation solution allows businesses to efficiently handle the influx of data coming from new customer-focused initiatives. IT Operations can automatically separate huge volumes of work into discrete manageable pieces. Instead of waiting on one job that has to sequentially process, a massive capacity of data workload can be run across multiple processors in parallel to dramatically reduce processing time.

Businesses can utilize the flexibility and elasticity of the Cloud when handling these large volumes of data. Workload can be moved from on-premises resources to the Cloud (and back again) depending on resource availability. With a distributed architecture automation solution, a Cloud service essentially becomes another distributed application server.

Increase Business Visibility and Control of IT Processes

With activity spread over many systems, banking businesses need to be able to integrate data management, customer, and transactional information into one view. Gathering and processing this data manually is costly and drains IT resources away from other business priorities.
Logging into separate systems to set up jobs, monitor activity, and check reports is inefficient and time-consuming. Working through multiple user interfaces, IT staff wastes time each day switching between systems, working with jobs, and fire-fighting problems. An IT operation that automates disparate workloads eliminates mundane manual tasks and allows the IT group to focus on meeting enterprise SLA requirements. In addition to using real-time metrics to optimize performance and minimize latency, IT Operations can monitor all processing activity through a single pane of glass. Some companies have saved 50+ hours of IT Operations overtime per month by implementing a distributed architecture workload automation solution.

The predictive nature of IT workloads can be used to ensure IT Operations are alerted to abnormal business events such as unusually long run times, or a lag in reporting data. Distributed automation provides IT Operations sufficient time to resolve potential issues while minimizing any business impact.

**Manage Regulatory Compliance**

The increase in regulatory requirements has been a factor in financial services institutions restructuring their operations and underlying IT infrastructure. This need to make changes on what is audited to comply with new reporting requirements has spawned a new workload. Each new request can affect how jobs are run or change the data source location. In some instances, changes need to be incorporated in every branch in the organization. With a distributed architecture automation solution, IT Operations can make one change to a job template and have it automatically applied across to all affected systems. Automating this workload and other reporting requests is critical to satisfying industry compliance regulations.

Logging all activity details ensures that IT Operations is fully equipped with the answers required to successfully comply with various audits. To respond to these various requests, financial organizations must have the granularity and flexibility that is only possible by making information readily available across all aspects of the distributed infrastructure. IT Operations executives saddled with a rigid master-agent automation infrastructure struggle to meet these requirements.

By contrast, an automation solution with distributed architecture is designed to handle regulatory information requirements and other complex tasks. Distributed scheduling and the ability to determine capacity utilization allows IT operations to manage disparate production workload with no limitations on the number of jobs and job flows that can be executed.

**Reduce IT Ownership Costs**

When it comes to expansion or consolidation, financial service providers can gain significant advantages by integrating applications and platforms. With a comprehensive distributed automation system, businesses can create templates that can be replicated from one business unit to another in order to get up and running quickly. An organization can expand significantly without the need to add IT headcount.

Automation approaches built on master-agent architecture are more susceptible to difficulties related to scalability, performance, and roll out. Ownership costs for automation based on master-agent architecture increases as IT workload grows. There can only be so many jobs in a database and only so many clients connecting to each host. Too many clients per host leads to performance degradation and latency issues, hindering the ability of IT Operations to ensure business continuity and SLA compliance. Additional host servers mean extra costs as well as more islands of automation to manage. Using a distributed automation architecture, some businesses have reduced their scheduler footprint to realize significant hardware savings and eliminate up to 33% of network communications between servers. With master-agent architecture, IT operators spend more time managing hosts instead of proactively driving innovations that add value to the business.
On the other hand, a distributed architecture automation solution is not encumbered by master-agent ratios. IT operations can continue to add on-premises, virtualized or Cloud-located nodes without concerns for master performance or latency being introduced into enterprise workload. There are no limits when scaling, and performance data is readily available to monitor trends in scheduling activity and help decide if extra capacity is required to accommodate future workload demands. With a distributed architecture, incremental workload – incorporating physical or Cloud-resources - can be automated with no need to provision extra masters. The net result is an overall lower cost of ownership for IT assets as the business grows. Enterprises have managed to realize a three-fold increase in their IT Operations processing without increasing headcount.

Whether expanding into new geographies or establishing a new investment product or service, businesses can dramatically reduce implementation costs with a distributed architecture solution. Instead of physically provisioning on-premises resources when moving into a new market, IT Operations can abstract existing process execution profiles, configurations, and templates for executing in the Cloud or in an appropriate data center.

The same concept can be deployed when considering a new product or service. The business can run test campaigns by utilizing existing resources before committing to new equipment expense. Organizations require the ability to isolate the test and then integrate the results back to the same corporate entity. With a distributed architecture approach, the business has the ability to run the processes in the Cloud or by using existing physical resources.

**Lower Operational Risk**

IT system availability is imperative in a 24x7 banking environment. Even short-term outages can have significant financial implications. For example, some institutions that span multiple time zones and geographies need to consolidate and apply exchange rates to transactional data. There can be serious financial consequences if statements aren’t produced on time because of manual delay or network communications failure. If a banking system scheduler fails to completely apply updates causing the system to be out of sync, there could be a massive business impact. The event-based processing capability and reliability of a distributed architecture-based automation system significantly minimizes those risks.

Historically, server crashes or database failures were the major causes of IT failure. Nowadays IT workloads increasingly span disparate applications running on on-premises or Cloud-based platforms, so other factors such as a network failure can result in an outage, with a direct business impact. With an IT automation solution based on a distributed architecture, there is no single point of failure across the entire enterprise. Each application server is fully equipped with an agent that delivers complete automation capabilities, ensuring autonomy of local operations and cross-server communication. This type of reliability has resulted in some organizations showing a reduction in incidents and problem resolution times by up to 90%.
As can be seen in Figure 4, an outage is contained to one single node and only jobs that are assigned to that node – minimizing the impact on the production environment. Workload can continue to run locally and autonomously on all other servers. As a result, with only a single node to reinstate, recovery is rapid. With a distributed architecture, multiple application servers can run simultaneously on the same physical node in a cluster. This guarantees that restarts are automatic and almost instantaneous following a serious incident. Typically with a distributed architecture model, businesses can shrink automated disaster recovery time by up to 95%, from three hours to 10 minutes.

This type of reliability is essential for a financial services provider and ensures that the business will not be affected by major or minor system failures.
V. Summary
The competitive and evolving nature of the financial services industry requires an automated IT environment that delivers superior performance, reliability, and flexibility. Data must be gathered and processed efficiently, and acted on rapidly to seize the competitive edge. The most effective way to achieve those goals is through a comprehensive, end-to-end IT automation solution built on a distributed architecture. Benefits of this approach include:

- Rapid information turn time that improves operational efficiency and provides the business with the most up-to-date data for decision making
- Capability to rapidly process high volumes of data
- System-wide visibility to detect business issues early for quick problem resolution
- Ability to seamlessly integrate core mainframes with newer distributed computing systems
- Cost containment because of lower operational overheads and reduced hardware needs
- Increased availability of IT applications with fewer bottlenecks that put business services at risk
- Flexibility to take advantage of Cloud-based applications and resources
- Reliable system architecture with no single point of failure to avoid damaging outages
- Rapid and least cost expansion and system consolidation capability

As an IT operations specialist, ORSYP offers a superior solution to automate and optimize the performance of financial services industry systems. A major shift has been underway in the financial services IT operations profession - from running IT as a cost center to helping to develop a strategic advantage and drive profitability. Banks need IT operations software that accelerates service delivery, dynamically scales and meets surge demands, and optimizes IT performance at the lowest total cost of ownership.

Leading financial IT executives choose ORSYP because its transformational software automates all business systems, wins back time in demanding banking environments, and is supported by proven expertise. ORSYP’s efficiency gains enable banking services IT executives to deliver a multiplier effect on IT operations and business service levels. With ORSYP, financial service institutions can lower infrastructure costs as much as 80%, accelerate throughput by 250%, and scale IT operations 300% — without adding headcount.

The competitive demands in the financial services world will continue to grow. The best way to meet these demands is through a comprehensive, fully integrated, IT automation solution.
About ORSYP
ORSYP is the IT operations specialist for automating and optimizing the performance of your business systems. Its transformational software is designed for the most demanding IT environments, wins back time every day, and is supported by deep expertise that is trusted by 1500 customers around the world. With ORSYP’s efficiency gains, IT executives deliver a multiplier effect on their IT operations. ORSYP is headquartered in Paris, Boston and Hong Kong.