
THE CARE & FEEDING OF
Digital Labor
FIELD GUIDE
THE WORLD IS YOURS
A LOANLOGICS TECHNICAL BRIEF

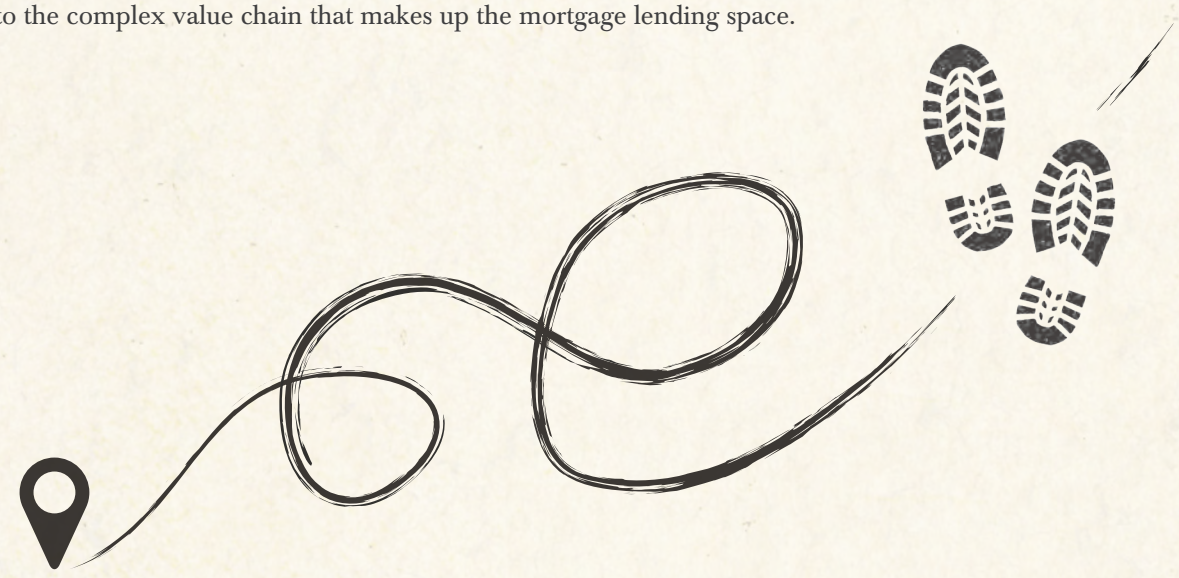
“Employing” Digital Labor

It is a time of incredible change. New innovations are enabling the mortgage industry to respond in more flexible, automated and virtual ways, all of which will enable lenders to speed the loan origination process, control staff costs, and maintain compliance.

This white paper will discuss best practice for “employing” digital labor and some key technology attributes that should be considered.

- *How to ready the organization for new technology.*
- *Vendor considerations for managing technology projects.*
- *What is cloud-native and why is it important?*
- *Why is a microservices architecture less disruptive?*
- *How to leverage and share data across your IT infrastructure.*

A digital workforce can drive significant benefits for the mortgage industry. Digitizing work reshapes the lending process, creates flexible business processes, and scales your organization. The result is a dynamic organization that can grow and is tightly integrated into the complex value chain that makes up the mortgage lending space.




When first employed
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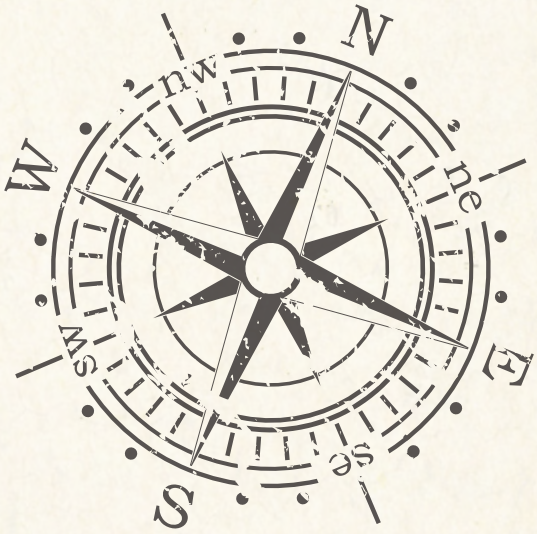
of Digital Labor

When first employed

When implementing new technology, one can become caught up in its set up, user access and functionality training. While all that is important to ensure quick adoption, there also should be an examination of how the technology impacts current workflow and processes.

> *Understanding where processes can be changed or eliminated goes a long way in realizing the full value of technology and is crucial to its return on investment. Mapping this out ahead of time can help to establish organizational trust and acceptance of automation as a key component of success. Where human work can be repurposed into higher value tasks can also increase job satisfaction.*

Alignment of feature functionality and internal workflow requires strong collaboration with your vendor. They know the product capabilities better than you do, but you understand your own processes better than they do. Together you can raise each other's knowledge level to make the most out of your technology investment, plan your roll-out strategy and reduce the user adoption curve.



In some instances, there may be customization required based on specific business needs. The good news is, where in the past some requirements even forced organizations to code their own applications, today vendors are open to working with clients to collaborate on functionality enhancements. This is an area where an understanding of your vendor's development process is critical. Ask what project management methodology your vendor follows to understand how rapid and/or iterative that process might be. After you have provided requirements, it should not be months until you see the product for the first time. More flexibility in development is created with shorter intervals and parallel and overlapping client exposure to test functionality. This helps to ensure it will meet business requirements and provide return from your investment.

Those vendors that also assess broader interest in functionality across their client base can deliver additional benefits. You may be able to reduce the cost of your investment, sharing it across several of your vendor's clients. Your vendor should also be proactive in recommending modifications that might make the functionality more broadly applicable as a general product release rather than a client-specific customization.

Some best practices we have found useful in our own deployment of technology, as well as what we have observed in some of the most successful client deployments of our technology include the following:

Evaluate your current staff on comfort level with technology.

User adoption and trust in technology is paramount to its successful implementation. To ensure this, you need to evaluate the staff that will be impacted by the new technology and understand their comfort level with the changes it will create.

It is time to move on from "the way we've always done it" and embrace change.

- ✦ *Assess each individual staff member.*
- ✦ *Identify those that might be most comfortable and leverage them as change ambassadors.*
- ✦ *Incorporate this assessment in your hiring practices.*
- ✦ *Celebrate early successes and leverage staff input to "fine tune" technology configuration to drive the most value.*

Define a new workflow and integration points ahead of technology deployment.

Evaluate the workflow and procedures you currently follow and determine what needs to change to take full advantage of new technology.

- *What tasks do your staff perform that will be automated with technology?*
- *How will you repurpose that time to deliver higher value to the business and increase job satisfaction?*
- *How are those tasks related to other software applications and technologies being used in your current workflow?*
- *What adjustments will be necessary to maintain the flow of data and tasks across systems.*

Benchmark productivity pre and post technology implementation.

Prior to the deployment of new technology, benchmark your current productivity so that you can measure improvement as new technology is rolled out to users. These types of metrics should be monitored on a consistent basis to ensure full and proper use of new technology and continuous process improvement.

As your digital workforce grows

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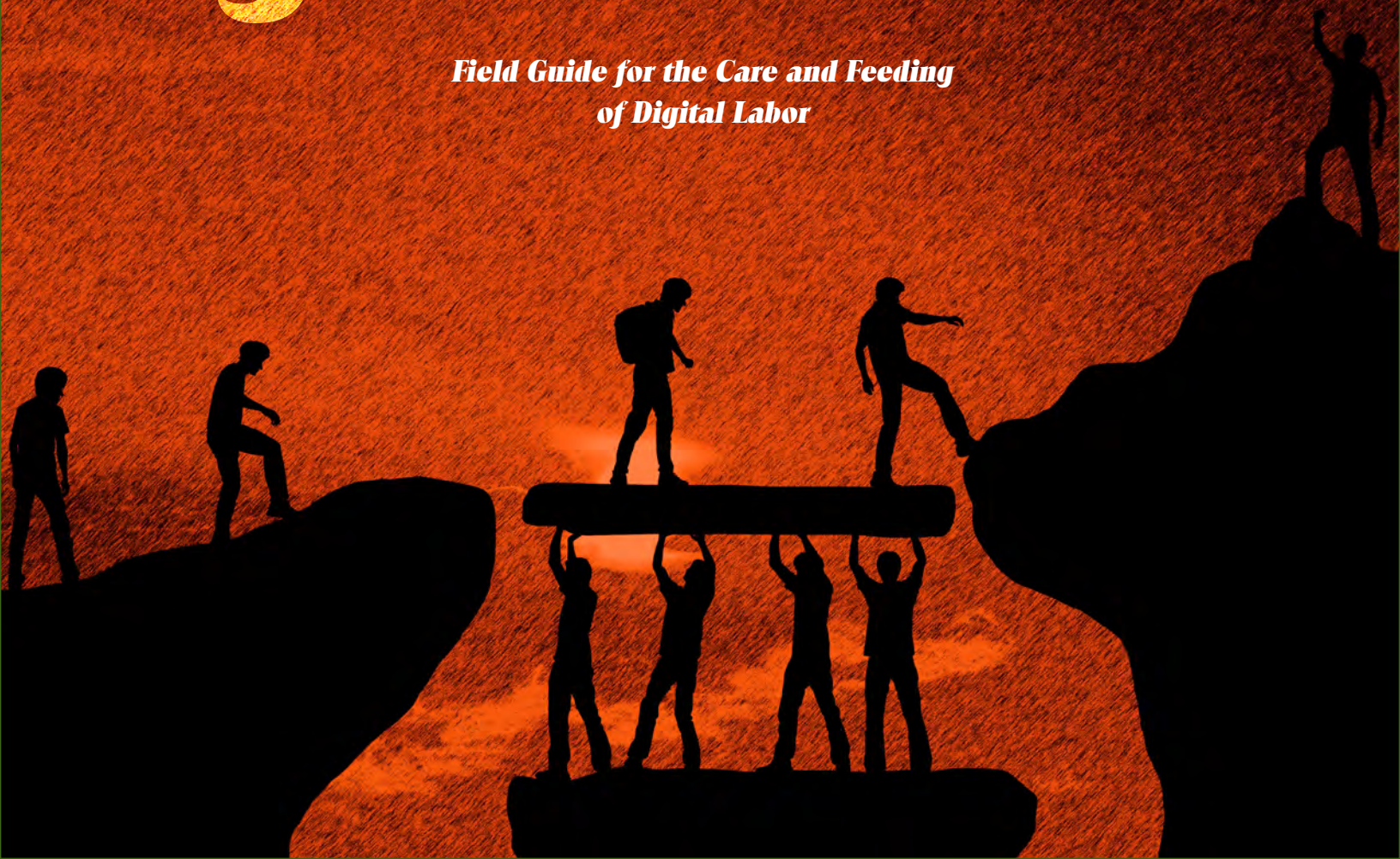


As your digital workforce grows

Consider "the cloud"

As the task complexity and volume grows for your digital workforce, there are additional considerations regarding scalability, security and development flexibility that should be evaluated.

> *Digital labor, just like any workforce, needs to have ongoing development to expand and grow with your business. Understanding the technology architecture, testing procedures and development cadence of your software vendors can help you assess their ability to seamlessly enhance functionality and help you expand digital lending at scale.*

"Cloud computing" has certainly become the buzzword for technology architecture over the past 10 to 15 years. When the mortgage industry first began embracing cloud technology, the cloud was seen mostly as a platform for expanding capacity. Instead of maintaining on-site servers, which are expensive to own and maintain, lenders could host their data in the cloud through virtual hardware and servers. *Infrastructure as a Service (IaaS)* became all the rage, allowing software developers to spend more time on their applications and less time managing infrastructure.

With advancement for constructing environments strictly using software, often referred to as *"Infrastructure as Code" (IaC)*, development routines and tasks became streamlined. Software environments could be quickly created (in minutes instead of weeks) and exposure to human error associated with server configuration was greatly reduced. Additionally, QA environments could be built on the fly in support of both automated and manual testing, yielding higher efficiency and effectiveness for the QA process.

But not all "clouds" are alike. A perfect example is the difference between "cloud-enabled" and "cloud-native."

Cloud-enabled applications are hosted in the cloud and delivered through web browsers as a Software-as-a-Service (SaaS). Even though they are hosted in the cloud, these application providers are only using the cloud generically. They still need to perform maintenance and upgrades on all aspects of functionality tied to their operating system. This involves things like management of computing power, devices, security and performance. Everything from identity management to messaging must be "built" into the application and continuously managed, lengthening overall software deployment cycles.

In a "*cloud-native*" application, best of breed capabilities and database technologies are provided by the hosting cloud service provider, such as Amazon, Microsoft or Google. Without this overhead, software companies and developers are freed up to produce and deploy application code in the cloud much faster and less expensively than if they also had to maintain their own IT infrastructure.

Cloud native solutions can also handle almost unlimited demand because they are so easily scalable, hugely beneficial for mortgage lenders when managing large swings in volume. Access to new functionality is also improved because code can be written and pushed immediately into the cloud. Lenders can then choose what functionality they need and when to operationally deploy.

> *When you peel back the onion, it becomes apparent that being "cloud-enabled" does not take full advantage of everything the cloud has to offer. Cloud native technologies, on the other hand, are different because they were designed and built in the cloud, and not simply made accessible through the cloud.*

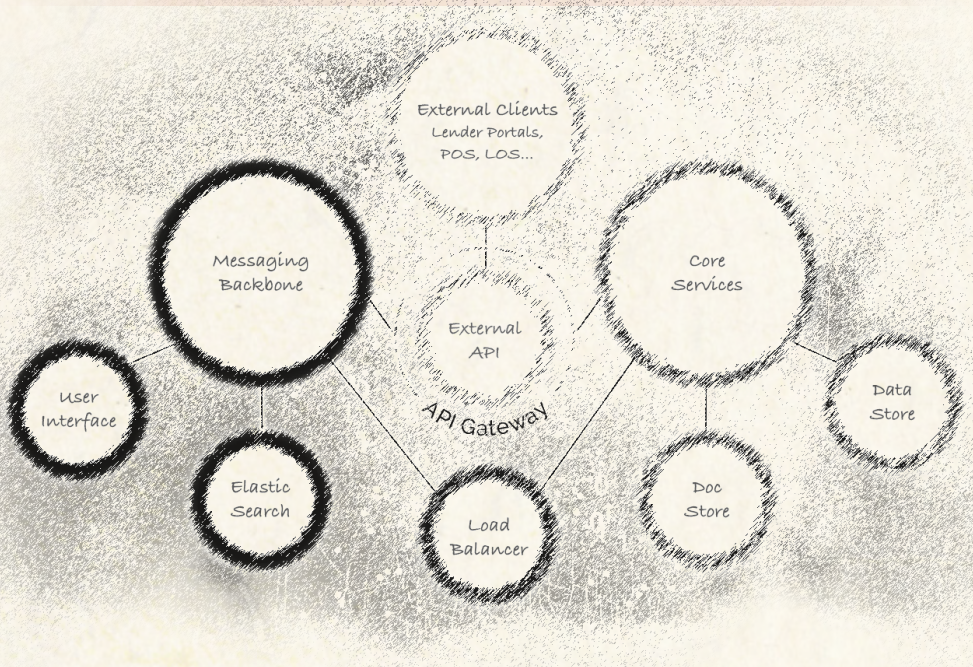
In the mortgage industry, the vast majority of applications are moving toward more of a hybrid architecture. This can include some components that are cloud-native, thereby offering the benefits of both worlds. For example, legacy applications can run on the cloud with web or database services migrated to cloud-native. That should give lenders additional peace of mind that many of the applications used to run your business are safeguarded by the latest advancements in security, data protection, data replication and disaster recovery.

One thing to keep in mind, however, for applications where scalability and development speed are critical, cloud-native rises to the top. It is truly "future-ready" to deliver enhanced value over the life of the application.

Individualize your digital labor

When you initially invest in technology, you hope to leverage the value of your investment through adoption of enhancements that help your business grow. However, as software becomes feature rich and diverse, complexity increases, and software vendors need to employ larger staffs to manage feature interactions when rolling out new functionality. Vendors also struggle with timely and efficient testing and quality assurance (QA). In the long run, that simply doesn't scale and costs you more money. This is where it is really important to address QA automation.

Microservices architectures individualize your digital labor force to address this issue. They enable the design of networked and interoperable applications on the Internet. The benefit of microservices is that they can be maintained independently, reducing the overhead and cost of implementing changes in one component of an application but having to test the entire application, end to end, every time. As illustrated below



As your digital workforce grows

Microservices can easily be tested thoroughly with each incremental change taken one step further, vendors who have adopted state of the art test automation, are in a far better position to rapidly and reliably test, minimizing human error and testing teams that simply lose focus over time with repetitive tasks. This type of automation offers a means of being more responsive to customer needs, while ensuring consistent application functionality. Enhancements can be delivered in shorter sprints and new functionality delivered confidently and with fewer bugs.

Elevating the skills of digital

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Elevating the skills of digital labor

Use case: *Verification of loan file data*

Just as training and experience hone the skills of any lenders' workforce, the same applies for the digital workforce. More and more, automation incorporates sophisticated rules and algorithms, machine learning and artificial intelligence that must be "trained" to perform tasks and will "experience" improvement through actual use. In mortgage lending, these digital labor skills are most aggressively being applied to data and document processing.

Verification of loan file data has historically been a challenge for lenders. The information comes from a variety of sources and in a variety of forms. Least challenging is the data that comes directly from the source, which in some instances needs little or no re-validation. Most challenging is data that comes from paper. It is the co-mingling of data from all these sources that causes errors in the origination process.

More recently, processing loan file documents has really become a science. It is a space where machine learning has transformed the industry and almost eliminated the use of manual labor. Vendors in this space tout accuracy and efficiency benefits, but when you look behind the curtain there is a reality that often doesn't live up to the hype. This is where lenders should educate themselves during the selection process to understand some fundamental capabilities.

- Is this machine learning "trained" across a broad set of mortgage documents?
- Can this machine learning identify documents with a great deal of variation?
- Can this machine learning classify both structured and unstructured documents?
- Are there options for applying machine learning processing and data extraction for a bulk of loans as well as document(s) on a per loan basis?
- Is the machine learning and data extraction continually enhanced and made available to all clients?

Lenders need to have the capabilities to automate document processing as required throughout the origination process. This will ensure greater accuracy as a loan is being "built" and stronger quality control pre-close, post close and during the loan acquisition process.

Example

Automate the process of identifying and classifying loan documents as they are received and extract loan data inline and in real time during production. Normally this would take hours for human staff to perform, but with cloud native solutions, it can happen in seconds. This frees up a lender's staff to focus on exceptions instead of managing each document individually for every loan file.

1 Document Intake
Client PDF Doc(s)
via UI or API

2 *Cloud-native Services*
Machine Learning
ADR & ADE

3 *Exception UI*
Real-time
Digital Assistant

4 *Index + Extraction*
Industry Standard Outputs
Export via UI or API

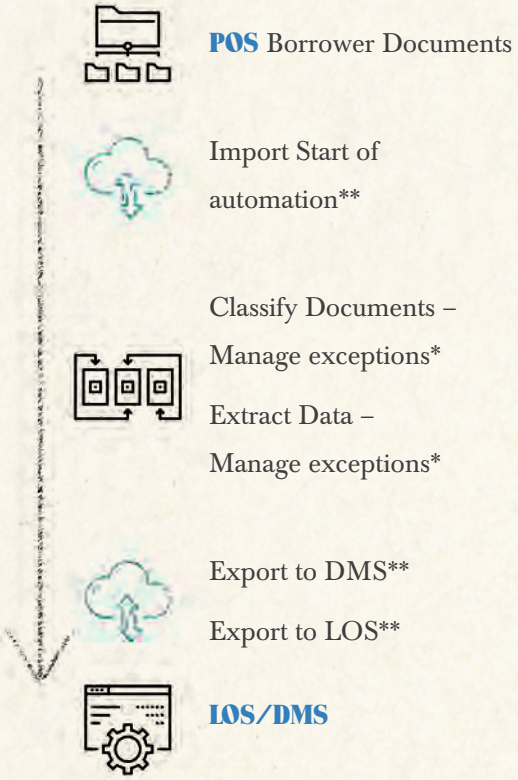
Use case: *cross-collaboration*

Cross functional teaming and collaboration with partners has always been foundational to business operations. That applies to the digital world as well. A digital workforce can co-mingle with human skills and/or cross technologies to create more efficiency in the mortgage process. Lenders should give careful consideration about what to connect and how.

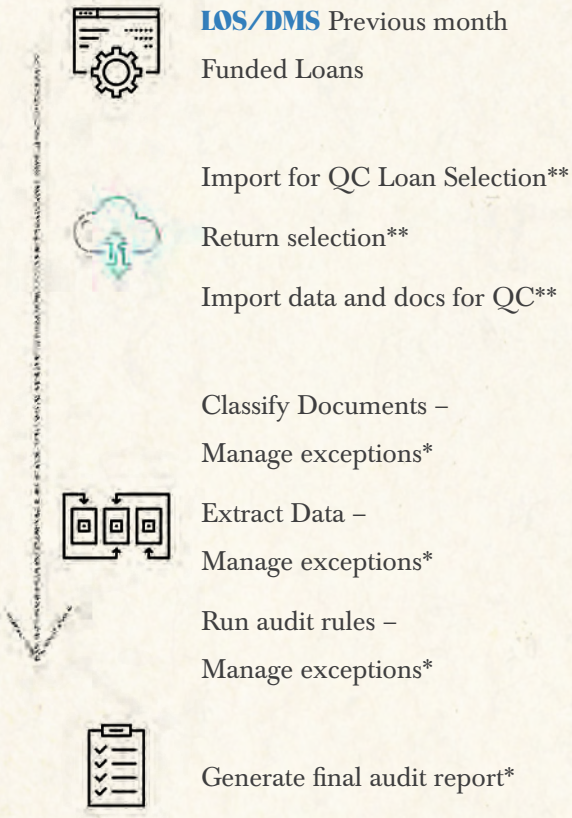
Connecting the digital labor force is possible through technology integrations and/or APIs. Vendor applications that support open APIs offer more flexibility for IT staff to connect applications and define a flow of information and/or notifications that traverse their technology ecosystem.

As lenders define their internal workflows and the applications used to perform certain tasks, they should map out their information flow and determine if an integration could be created to simplify the workflow. The following are some simple examples:

Real-time Document Processing Automation



Scheduled Post Close QC Automation



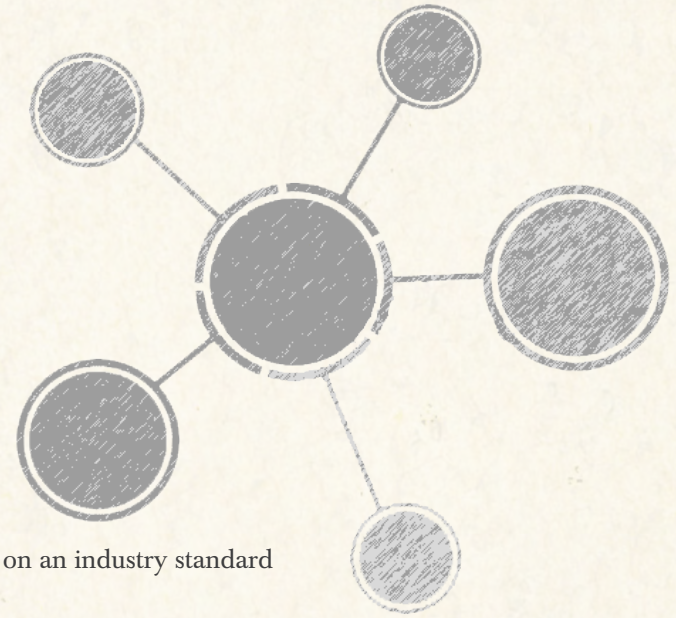
**LoanLogics technology*
***Points of integration*

All of this could be accomplished through manual importing and exporting of information, but far greater efficiency can be realized through an integration or the use of an API client.

Application to application integrations and software interfaces create a more seamless workflow and can also enable the use of specialized, best in class tools or data services. Generally, these types of integrations are developed by software providers and provide benefits such as a secure multi-directional flow of information, simplification of the user experience, and support for service ordering and delivery from third-party providers.

APIs offer more flexibility in that they can be leveraged by software providers or your own internal IT staff. When leveraging APIs, it is important to understand how they incorporate security and performance controls. Security should always be the number one priority. Following best practices and established standards will ensure all areas including application access and data will be secure. Understanding the expected volume of requests will help drive appropriate throttling mechanisms to keep your API performing at its best.

Speak to the API *(Application Programming Interface)*



Computing interface that defines:

- how it can be used
- the kinds of requests that can be made
- how to make them
- data formats that can be used
- conventions to follow

API design spectrum -> from entirely custom to based on an industry standard

What goes on behind the API, stays behind the API

Connected systems rely on the API, therefore changes to internal details of the system providing the API should not affect API users.

If using your own IT staff to develop API connections, best practice suggests building these in ways that make them usable by multiple clients. A single API can be created to support similar calls to functionality and information for several applications. Your API strategy should carefully consider how many APIs you actually need. A proliferation may become complicated to manage, while too few may not meet your goals for process automation and workflow efficiency.

Finally, when considering points of integration, it is also important to gather input from operational functions. This can ensure workflows are defined properly and create measurable process improvement.

> *One-off implementations are not providing the lift lenders need. Instead, trust in technology, trust in an integrated workflow and eliminate parallel manual practices.*

Conclusion

There is a lot changing is the world of technology, much of which is enabling a much more efficient and highly skilled digital workforce. The care and feeding of that workforce requires awareness of the latest techniques for software development and data management.

Digital labor validates and leverages data to automate work. This creates implications for the human skill sets needed to operate the business. For the mortgage industry, refocusing skills and procuring new skills are being driven by the application of artificial intelligence to industry problems, the shift of technology to the cloud and the codification of lending practices to digitize the industry.

What the future holds is an output of clean lending and compliance data, reduced cost, improved efficiency and more business insight. Institutional knowledge will rest inside systems and applications, not in people's heads.

> *With technology doing the heavy lifting, the application of human skills can be adapted to much more strategic and high value work, such as defining lending parameters to balance business risk with growth and profit goals. The underlying tactics that support those strategies are well suited to digital labor.*

Digital labor is a workforce waiting to be exploited.

Glossary

Digital labor *produces value through the interaction of information and communication technologies. The goal is to automate time-consuming, tedious, and rule-based work. Through this digital labor enhances the productivity of intellectual labor, leaving staff free to focus on the cognitive and emotive analysis of work and communication with each other, clients and vendors. Source: LoanLogics*

Infrastructure as a Service (IaaS) *is the practice of delivering a full compute stack – including servers, storage, networking and operating software – as an abstract, virtualized construct… IaaS allows users to consume only what they need while offloading complex and expensive management tasks to their provider. Source: Techopedia™*

Infrastructure as Code; *Infrastructure as code (IaC) is a type of IT abstraction where professionals provision and manage a technology stack with software, rather than setting up hardware systems. Infrastructure as code can be used to provision cloud systems and to virtualize various kinds of software environments. Source: Techopedia™*

Cloud-native; *Cloud-native architecture is an architecture or system that has been built specifically to run in the cloud. Cloud-native architectures have the benefit of more flexibility over legacy systems that were built to run on a particular hardware infrastructure, and may be difficult to migrate to the cloud later. In a sense, cloud-native architectures that are well designed actually make use of the versatility and scalability benefits made possible by the cloud, while other implementations may not. Source: Techopedia™*

Cloud-enabled; *Cloud enablement is the process of creating, deploying and operating some or most of an organization's IT infrastructure, software and resources through the cloud. A cloud-enabled organization generally relies on a cloud provider for basic to enterprise grade IT solutions and services. Cloud enablement can have many different models and implementations. Typically, cloud enablement is achieved when the in-house data center or server infrastructure is removed and replaced by a similar cloud solution. This includes servers, operating system and business applications that are accessed remotely over the internet. Moreover, consolidating in-house servers for virtualization and building a private cloud out of it are other examples of cloud enablement. Source: Techopedia™*

Microservices (ADR and ADE); *Microservices is the idea of offering a broader platform, application or service as a collection of combined services. These microservices provide specialized, fine-grained cooperation that makes up the more comprehensive architecture model. Source: Techopedia™*

An **application programming interface (API)** *is a computing interface to a software component or a system, that defines how other components or systems can use it. It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used, the conventions to follow, etc. It can also provide extension mechanisms so that users can extend existing functionality in various ways and to varying degrees.[1] An API can be entirely custom, specific to a component, or it can be designed based on an industry standard to ensure interoperability. Some APIs have to be documented, others are designed so that they can be "interrogated" to determine supported functionality. Since other components/systems rely only on the API, the system that provides the API can (ideally) change its internal details "behind" that API without affecting its users.*
Source: As defined by Wikipedia

Acknowledgments

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