

Now is the time to conquer the last mile to full data automation

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ABSTRACT

Innovative new technologies and a desire to update the operating model are paving the way for financial services firms to automate data management across their organisation. This is something that historically has been impossible due to the proliferation of unstructured financial data that legacy technology is unable to handle. The resulting mass adoption of spreadsheets as a workaround created a 'last mile' of data processes that firms have been unable to automate. This paper explores the current technology landscape in financial services, the problems this has created for data management and the benefits for firms of using new tools to conquer the 'last mile' of automation.

Keywords: data, automation, machine learning, digital transformation, business agility, data governance, spreadsheets

Financial services has reached an inflection point in how the industry manages data. There now exists a perfect combination of new technology, changing business priorities and external pressures to make the case for institutions to strive for full automation. Despite achieving high levels of automation for core functions, such as high-volume trading or consumer banking, the complexity, variety and scale of financial data has created a 'last mile' to automation that is littered with barriers, pitfalls and cost-sinks.

Now, a changing technology landscape has created the components that, when combined with a new focus on sustainable and scalable operating models, paves the way for financial services firms to travel this last mile.

'Data automation' is where the many disparate data tasks currently taking place across spreadsheets, point solutions, extract-transform-load (ETL) layers and data lakes are brought together and handled with minimal human intervention. Staff become 'humans in the loop', providing intelligent decisions and analysis rather than manipulating data. This is achieved by combining flexible and intelligent tools that allow preparing, checking, repairing and reporting on data.

Uniting the power of the cloud, machine learning and new approaches to user experience empowers financial services firms to unlock the potential that has lain dormant in their data for so long. This last mile to full data automation is the hardest to travel, but it is where the biggest benefits lie. Progress here enables firms to transcend the industriousness of manual data processing, use their data as a source



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of business intelligence, bring operations and IT departments together and empower their staff without sacrificing governance and control.

So why has the last mile to full data automation remained untravelled for so long when conquering it promises such huge benefits? Core processes, like payments made to settle a securities trade, have been the focus of automation efforts for a long time, beginning in the early 1970s with the development of Automated Clearing Houses (ACHs) and the Society for Worldwide Interbank Financial Telecommunication (SWIFT) network.

So why have efforts met with relative success in some areas, yet elsewhere progress has stuttered to a halt? Why does the last mile of automation still exist, and why is it paved with spreadsheets?

And given that many of the problems outlined in the following section have existed for a long time, what is it about new technologies in this space that make the impossible now possible?

This paper will explore the historical reasons for the continued existence of the hard last mile to full automation, the innovations and changing circumstances that make change possible and the adoption paths for firms to implement data automation.

THE CURRENT STATE OF DATA MANAGEMENT IN FINANCIAL SERVICES

The financial services industry revolves around a core of heavily automated processes. But beyond this is the last mile to automation: an army of people working on all kinds of data-related tasks. These include everything from inputting and transforming to reconciling and enriching — many of which require manual processes and spreadsheets. In large organisations the number of employees doing this stretches into the tens of thousands.

But why does this juxtaposition between the highly efficient, automated core processes and the error-prone and opaque manual tasks exist in the first place?

The answer lies, in part, in the historical approach taken to data management. While it has often been sold this way, this is not a project; firms cannot start and finish it. It is like gardening; it requires constant attention and the right tools to do it properly. But for the past 20 years there has been a vision peddled across all industries that the goal was to create a perfect data set. Firms envisaged a golden source, preferably in a single system, that distributes clean, trustworthy data to every other system across the business (Figure 1).

The proliferation of End-User Developed Applications (EUDAs), point solutions, manual processes and the tens of thousands of full-time employees (FTEs) managing them shows that this approach does not work. A study by Censuswide on behalf of Duco¹ found that 44 per cent of financial services firms find the amount and complexity of data they now have to handle as a business unmanageable with their current systems and processes. In the same study, 42 per cent admitted they struggle with poor data quality and data integrity within their organisation.

The data challenge in financial services can be broken down into five key areas: variety, change, scale, life cycle and control.

The near-endless variety of financial data

Variety is a given when it comes to data in financial services. The categories of data are seemingly endless and that is before even considering that data of the same type can be formatted very differently depending on the source system.

For instance, anyone managing a client portfolio will have to deal with transaction, client, product, security master, pricing and market data. These are sourced

The impact of poor data quality on financial firms

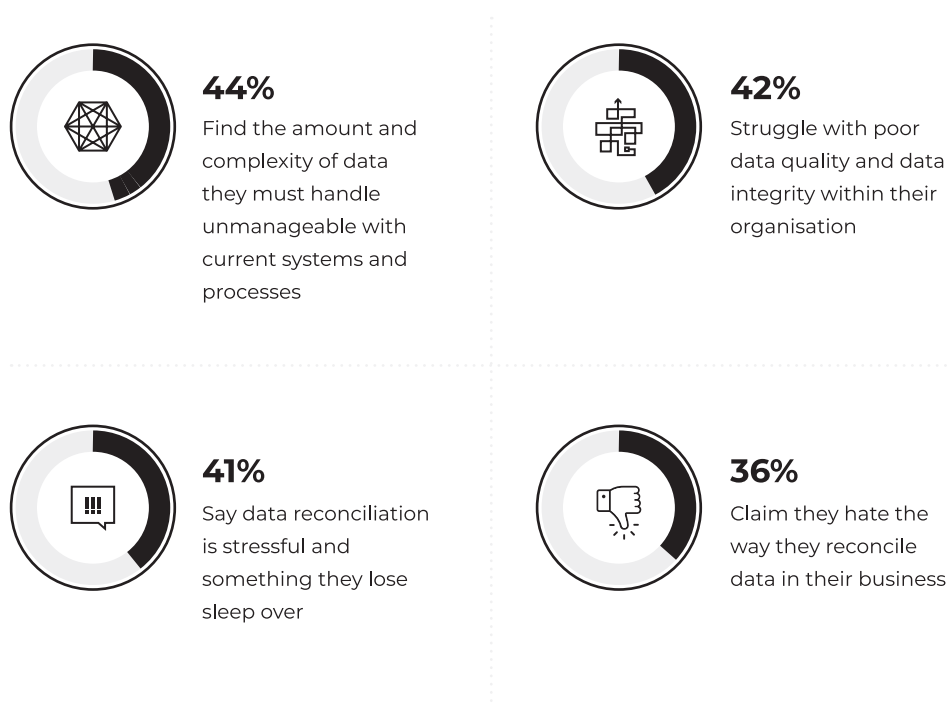


Figure 1 The impact of poor data quality on financial firms¹

from multiple trading systems, different pricing sources and market data providers, and so on.

Or take risk management, where teams need to use theta, vega, delta and gamma and more to model market risk relating to options.

Or the amount of metadata available on mortgage products.

Put simply, firms must assume they are going to get almost random data thrown at them in every department or function. Businesses change and innovate all the time and that means their data changes too. This is why it is impossible to build a golden source; firms always need to be able to react quickly to a new variety of data.

Keeping pace with change

Change is a constant feature in financial services. There are many things that can

change and it will happen faster than firms think. Duco believes it is prudent for businesses to assume they will be dealing with change on a daily basis.

Change can come from many sources. Corporate actions are a good example. Actions such as rights issues, tender offers, early redemptions, spin-offs, mergers and takeovers, to name a few, can require changes to data on pricing, securities identifiers, dividend amounts, company industry and much more.

This is all information that is required to enrich a trade during post-trade processing. Financial firms often receive automated updates to this reference data from third parties, but system errors — such as a delayed update — can mean the data is outdated. Post-trade teams unknowingly pull through the old data, which causes breaks downstream when it is reconciled against more up-to-date records. This is not just an

issue for post-trade processing, because this data is also used by departments other than operations, including finance, compliance and risk.

And, of course, there is regulatory change. Regulations including MiFID II, Basel III and IV, EMIR and SFTR all increased the number of data points firms must capture and include rules around what processes are required to ensure the data is accurate.

Change can also come from internal drivers, such as the launch of new products or the implementation of new systems.

Adapting to data issues at scale

It may seem that solving data problems at large scale is the same as doing them at small scale, only faster. But this is not the case. In fact, scale fundamentally changes the nature of the problem as the processing tasks and complexity start to go beyond human cognitive limits.

Market volatility has a big influence on the scale of data firms must process. The onset of the COVID-19 pandemic was a prime example. During the first quarter of 2020, as cases of COVID-19 began spreading across the world, the value of global equities trades hit US\$32.47tn. The number of trades in Q1 rose 37.81 per cent year on year to 8.6bn.²

This surge in volume created significant operational bottlenecks for capital markets firms. As EY³ noted in April 2020:

The pandemic exposed a number of vulnerabilities across the operations functions of the [investment bank], where market volatility and transaction volume spikes put pressure on operational capacity. The number of manual and custom processes that are offline to core workflow applications exposed specific challenges in providing flexible capacity to surge resource processes on demand.

Indeed, the Futures Industry Association⁴ reported that ‘record volumes lead to 15 times more contracts not allocated on trade date’.

One of the issues this surge in volume highlighted was the inability of the back office to scale as fast as the front office. Firms size their post-trade teams based upon the anticipated workload, which works for business as usual. But a surge in trading volume creates more work than the current team can handle, and onboarding new team members takes months.

Even if firms did bring new staff online quickly, the team becomes over capacity once the volume spike is over — until the next one, that is. So firms have to settle for a post-trade team that often has to work late or at weekends to get through the backlog, with the potential for errors increasing from an overworked team.

Tracking the complex journey of data through financial institutions

Data in financial services has a life cycle. It evolves as it travels from front-to-back — and sometimes back-to-front — through different parts of a firm’s architecture.

It is therefore difficult to track the data through its life cycle because it moves from one system to another. Firms must work out where it has been, in how many different places it resides and how it has changed on its journey.

The Bank of England⁵ remarked upon this as part of its Transforming Data Collection from the UK Financial Sector report:

As part of the quality checking process, both Bank and external participants reconcile related data between reports. Given the size and complexity of the reporting landscape, there are sometimes thousands of data points that can, and should, reconcile. Participants found this was often hard to do. Large firms struggled to ensure the

same data point tallied when it was submitted as part of multiple reports. Users of the data said at times they wondered which data to trust, after they struggled to identify the cause of differences between seemingly similar data points.

Tracking the data life cycle is particularly difficult in financial services, but it is critical. Data can travel through a huge number of different systems and often ends up duplicated across many different siloes. Multiple teams then manipulate the data separately, transforming and enriching it, independently of the wider organisation. It is therefore possible for multiple versions of data to exist at the same time.

This need to track life cycle immediately disqualifies much of the tooling that is available around data management from being applicable to this space. Data tools that are very successful in other industries also often fail in financial services because of the audit and governance requirements. Firms need to be able to demonstrate how they handled and manipulated data during its time in their systems.

It is a big challenge and one that is compounding in financial services as the volume and complexity of data — and the web of technology and tools used to address that — continues to explode.

Balancing agility and control

Under traditional governance frameworks, the business writes a requirements document, which someone in Operations or IT signs off on. It then gets implemented, tested and deployed. This process exists because there is a division between IT and the business, with certain tasks like data normalisation carried out by the IT department.

In principle, this is very well governed and is designed to ensure firms retain control of their data and avoid costly mistakes,

or even fines. However, it is slow and therefore inefficient, robbing the business of agility.

But a new issue related to control is emerging as firms rethink the way they deal with data on an ongoing basis. The industry is moving towards a new operating model where operations and IT work more closely together, which is putting more power in the hands of end-users.

This change causes tension, though, because of questions over governance. We see this in our customers all the time — they know they need to let go of some control, because they need to become more efficient in order to remain competitive. But they are understandably worried about letting people do too much, too fast and breaking their three-line control.

So the challenge of control is actually an evolving one. Traditionally too much control held the business back; now, without the right combination of technology and operating model, the organisation risks having too little.

How legacy and best-of-breed technology created a world of complexity

Some of the challenges surrounding data management have simply outgrown what can be done with existing technology and approaches. Others have been created by them.

Legacy technology is a particular issue, as the volume and variety of data firms are required to process now goes far beyond what they were created to handle. These systems are hard-coded to deal with data in a particular shape. Anything outside of this requires intensive and expensive ETL work to get the data into the same format as what the system can process.

The inflexible nature of these solutions, coupled with slow implementation phases and a lack of control for end-users, forced

staff to resort to manual processes, particularly Excel spreadsheets, in order to handle urgent data management tasks. The result is a technology landscape of hyper-focused systems, held together with an undocumented web of spreadsheets.

Another issue is that in the mid-2010s financial services firms favoured a 'best-of-breed' approach to data management systems, focusing on getting the right application for the right problem space. These point solutions have narrow applicability, meaning a huge number of them are required to address the various use cases that exist.

This combination of legacy technology and its supporting network of spreadsheets and vast application landscape of point solutions has long frustrated efforts to traverse the last mile to full data automation. Now, though, fundamental changes in the way data management solutions are designed and delivered provide a new route. New tools help firms to avoid many of the barriers that once made the last mile inaccessible.

How new technology makes data automation possible and helps evolve the operating model

There has been a wave of innovation over the past few years in the financial technology space. A lot of the tools mentioned below have significant benefits in their own rights. But it is when firms combine them that the last mile of data automation becomes accessible.

The cloud unlocks scalable, accessible computing power

Cloud computing has had a significant impact on the way financial institutions access data management services. According to the Cloud Security Alliance,⁶ the number of financial organisations that were actively using cloud services, or planned to adopt them within months, doubled to 91 per cent in the four years to February 2020.

The cloud frees institutions from the confines of their data centres, creating ease of access to systems for global teams and making their operations almost infinitely scalable. Cloud computing provides access to on-demand processing power on a pay-as-you-go basis, unlike traditional on-premise solutions that require the installation of extra hardware in a data centre, which hardware firms must pay for regardless of how much they use it.

The cloud enabled the software-as-a-service (SaaS) model for data management platforms, allowing vendors to seamlessly deliver the latest versions and features of their software instantly across their customer base.

All this has massively reduced the total cost of ownership of data management platforms. For example, one Duco customer reported savings of US\$1.25m per year on infrastructure costs after decommissioning two in-house legacy systems and one third party on-premise legacy system. They are still spending another US\$2m annually on licences and infrastructure for a second third party on-premise legacy system.

With the cloud there is zero cost associated with servers, upgrade projects, IT maintenance or ETL projects. While these are great for the business, cost savings alone will not enable financial firms to conquer the last mile to automation. It is the speed and accessibility offered by the cloud that make it such an important part of the data automation toolkit.

Empowering end-users with no-code functionality

No and low-code tools give non-technical users the ability to develop applications themselves. This has enabled financial services firms to adopt a self-service model for data management solutions, while drastically reducing costs and shortening time to market.

These platforms often have a simple drag-and-drop interface, but the potential

for advanced application development is enormous. Users can build everything from business intelligence dashboards to applications that automate processes that currently involve manually checking documents or manipulating data using spreadsheets.

No-code platforms cut costs for financial institutions by allowing end-users to build only the functionality they need. No one must pay for features they will never use. On top of cost savings, this lessens the demands on IT, creating a more agile department that can focus on more important, strategic projects.

Another type of no-code tool is Natural Language Processing (NLP). These tools allow end-users with an understanding of basic English to use dropdown menus to build data processes. Duco thinks this will evolve even further, with the ultimate vision for NLP technology being a system that can interpret plain English sentences written by users and convert them into executable code.

Thanks to no-code applications, data experts can create controls in minutes or hours that used to take weeks or months and tens of thousands of dollars to deliver.

Eliminating drudgery with RPA

Robotic Process Automation (RPA) is an example of a no or low-code application. It allows end-users to automate tasks that involve high-volume, repetitive work with clearly defined rules that rarely change.

For example, customer onboarding often requires a lot of manual intervention to process structured and unstructured data. RPA can help financial institutions perform anti-money laundering (AML) and know your client (KYC) checks. Currently these require a member of staff to review supplied documents and key in the relevant information to the firm's systems. They also have to verify the information by cross-checking the data against various databases and other sources of information.

RPA can automate these tasks. Robots can log in to servers, extract the necessary

data from databases, scan documents and extract key information, compile it and reconcile it to ensure its accuracy.

Intelligently processing data with machine learning

Machine learning, unlike RPA, excels where the business logic is not already clearly defined, but a large amount of training data is available. It can either be used to predict outcomes for future inputs based on analysis of historical data or analyse new data with unknown outcomes to spot trends and patterns.

Like RPA, this can be used to automate a huge number of the currently manual tasks being performed by human workers. It also gives firms an agile way to scale team performance in response to changes in workload.

A scenario mentioned earlier will be used as an example: spikes in trading volumes leave post-trade teams inundated with more work than they can handle. A machine learning algorithm can supplement the team by processing the excess transactions. It can be scaled up and down as required, unlike a team of human workers.

In the future machine learning will act as a gatekeeper for a firm's systems, recognising bad data at source and preventing it from spreading to downstream systems.

Combined with RPA, machine learning allows the automation of many of the formerly manual tasks around data quality. For example, identifying, assigning and resolving exceptions when performing reconciliations. This frees up employees to focus on the most important aspects of data quality, such as resolving genuine data breaks and inaccuracies caused by something other than difference in format or low-quality inputs.

There is some scepticism in financial services regarding the effectiveness of machine learning. But what has been observed is that the objections that arise

usually revolve around data quality issues, not the capabilities of machine learning tools themselves.

Firms can unlock the full power of machine learning by pairing it with the cloud. This allows the models to train on a much larger dataset; it is possible for platforms with machine learning to test models across all customer data without compromising on security or segregation. Models developed on test data can be ‘chucked over the wall’ and run on customer data. Data scientists only see results in terms of percentage of accurate predictions. Effective models can then be deployed to all customers — another advantage of the SaaS model.

This means that a new customer-building data management processes has access to machine learning that has already been trained on potentially billions of data records. Compare this to an on-premise platform, or one on a private cloud, which has to learn from scratch and from a much smaller dataset.

It is by combining all these technologies that financial services firms can achieve the goal of true data automation. It will enable them to consume, check, process and record data without the need for a last mile of manual processes.

Achieving business agility through data automation

Complete, enterprise-wide data automation enables financial services firms to unlock the agility they need to stay competitive in an evolving marketplace.

Data automation enables firms to ensure the trustworthiness of their data. It is ready to be used without the constant checking and re-checking that comes from having poor visibility over its life cycle. Having confidence in their data allows firms to perform actions such as launching new products and business lines, and onboarding new clients, much more quickly, expediting time to

revenue. It simplifies regulatory reporting by making it easier to source and aggregate accurate data. Plus, having a transparent picture of the entire data life cycle increases the auditability of their operations.

There is another benefit to agility as well: it enables firms to upskill their employees by ridding them of the burden of manually checking and re-checking data. No one wants to hire the best and brightest minds and sit them in front of Excel spreadsheets. The world of FinTech offers far more enticing opportunities for top talent, but it is important for financial services firms to attract and retain them as external pressures continue to build.

As Deloitte⁷ notes in its Future of Work report:

A key area of acute market pressure is talent. The ability to attract and retain top talent is a make-or-break differentiator in financial services. To win in this space, the future financial services organisation must create a ‘simply irresistible’ working experience that is mutually beneficial for all stakeholders. A smart approach puts employees at the center, treats them like customers, and works to enable their success. This results in innovative, satisfying and highly effective work outcomes.

Candidates are now seeing how the world of work is changing, particularly thanks to the technology now available to them. They are looking for jobs that empower them, that give them more control at their fingertips. Today’s workforce wants to make a difference in their jobs. Duco thinks the direction of travel is to have fewer people with more powerful tools getting more done. If the industry is not already moving in that direction, it soon will be.

From an operational perspective, data automation brings business, operations and IT closer together. It breaks down the

barriers between these departments, eliminating the big handoff points that otherwise stymie agility. For example, an operations team wants to focus on data quality tasks but cannot until IT completes a normalisation project. However, with data automation in place, IT can demise systems around reporting, internal data workflows and reconciliation, leading to a consolidated and modernised infrastructure and advances the cloud agenda.

Data automation creates a new operating model where seamless collaboration becomes possible. Experts in each department are freed to focus on their core responsibilities and on value-added activities. Departments become enablers of each other instead of creating bottlenecks.

These benefits — greater business agility, upskilling employees and evolving the operating model — all align with the core strategic pillars of many firms in the financial services space. This is the direction the industry wants to go.

Where will data automation have the greatest impact?

As outlined in Figure 2, data automation will have widespread benefits. Duco's research with customers shows that data automation allows for 85 per cent faster implementation than legacy solutions or EUDAs. Business requirements documents alone can take up to 84 days to create for a point solution. Data automation gives the power to build the process to the business user who actually needs it, cutting out the need from complex documenting of requirements and knowledge (Figure 2).

Data automation also dramatically cuts exception investigation time, and time to respond to an audit request. In total, operation times are 90 per cent faster.

Naturally, the greatest areas of impact will be in the departments that still have

to conduct the biggest data management tasks, in terms of both volume and complexity: finance, operations and risk departments.

Finance departments spend a lot of time manually consolidating and reconciling data for a number of activities, such as balance sheet substantiation — a vital task to ensure the accuracy of profit and loss. Staff need to compile data from multiple sources, including bank statements, trading sheets, sub-ledgers and manual entries. The format of this data can vary greatly from system to system.

Operations teams deal with similar challenges for a number of tasks, such as reconciling trades, positions, fees and commissions against broker records. Varying data standards between brokers, particularly when derivatives are involved, means teams must deal with records in different layouts, formats and using different naming conventions. This lack of standardisation causes a real problem for legacy systems, leading operations teams to resort to a lot of spreadsheets to complete this task.

Risk departments will benefit greatly too. Research conducted last year by Duco in partnership with the Professional Risk Managers' International Association (PRMIA)⁸ found that 64 per cent of risk teams say the majority of their time is spent handling repetitive issues such as sourcing, transforming and reconciling data for use in their risk management systems. Easy access to accurate data frees risk teams from manual work and enables them to react much quicker to the business needs.

As the European Central Bank⁹ noted on the topic of BCBS 239 regulation: 'Fully automated processes requiring no manual intervention will strengthen credit institutions' ability to produce aggregated data on an *ad hoc* basis for internal risk management purposes and in response to external requests'.

Data automation vs legacy solutions

	CHANGE THE BANK				RUN THE BANK	
	BUS. REQUIREMENTS DOCUMENTS	IMPLEMENT	OPERATION	GOVERNANCE & AUDIT	REPORTING	
Point solution	14-84 days	42-84 days	1-8 hours reactive investigation/day	Unmeasurable	Disparate	
EUDA	14-28 days	1 hour-14 days	14-28 days	Unmeasurable	Almost impossible	
With business-enabled data automation	0-1 day Minimal, self-documenting PDF generation	1 hour-14 days All self-service, from ingestion to workflow. Built-in process lifecycle management for business users	0-0.5 hours exception investigation time / day Machine learning powered root cause analysis	5-30 minutes to answer audit request Audit pack exported from platform	Global single view Real-time time-series platform across all processes	
	85% faster to change				90% faster to operate	

Figure 2 How data automation transforms and accelerates both 'change the bank' and 'run the bank' activities
Source: Duco

Case study: Business-enabled data automation

Phase	◀◀ Before data automation	▶▶ Initial data automation deployment	Target: Enterprise deployment
Processes & technology	<ul style="list-style-type: none"> + 4 legacy systems + 900+ spreadsheets across capital markets + Matching rates: 95% 	<ul style="list-style-type: none"> + 2 in-house legacy systems fully decommissioned + External legacy system fully decommissioned and partial decommission of another + 400+ Excel spreadsheets automated + No need for ETL + Matching rates: 99% 	Expanding data automation across cash, securities and regulatory use cases
People	<ul style="list-style-type: none"> + 25 FTE outsourced + 19 new FTE required 	<ul style="list-style-type: none"> + 0 FTE outsourced + 0 new FTE hired 	<ul style="list-style-type: none"> + 25 reduction in FTE outsourced + 25 reduction in internal FTE
		\$3m saved/year	Projection: Additional \$4m saved/year Total saving of \$7m/year

Figure 3 The cost savings and efficiency gains unlocked by one firm on their journey towards data automation
 Source: Duco

How do financial services firms implement data automation?

Data automation may have significant and far-reaching benefits for entire organisations, but firms can take a gradual, phased approach to adoption. This allows them to easily manage change, ensure that best practices are observed at each stage and that governance remains in place. It involves gradually replacing EUDAs, including spreadsheets, and legacy systems and creating a new global Target Operating Model, for huge cost savings and efficiency gains.

Conquering the last mile to data automation does not require an all or nothing approach. It can be a project that starts with a single use case addressing one problem area. It could be data quality for reporting under a particular regulation, a control such as intersystem reconciliations, and so on. The important thing is to pick a key pain point that is measurable and time bound. Setting up a data automation platform to

focus on a particular use case like this gives an easy way to measure return on investment (Figure 3).

Once these benefits are proven, the next stage is wider adoption. This could be through expanding the use case that has already been automated into other departments or involve moving on to related use cases. At this stage the project could expand to use cases such as eliminating EUDAs, ensuring risk data integrity or automating onboarding processes.

This is a more transformational activity, requiring a longer timeframe — around 12 months — and bringing even greater savings. Firms at this stage look to establish an initial Centre of Excellence and achieve at least 50 per cent reduction in the number of reconciliations required by eliminating many Excel-based and manual processes. It demonstrates to the business the potential for data automation to operate at scale and how other parts of the data pipeline can be brought on board.

The final stage is enterprise deployment. This is a project spanning 12–24 months, involving the elimination of all remaining manual work and use cases on point solutions. Firms can remove their legacy and in-house solutions. Duco's modelling suggests the end result should be an 80 per cent reduction in reconciliation processes and the enablement of a new global Target Operating Model. It is the most transformational stage, but by now the benefits of data automation have been firmly demonstrated. And alongside the efficiency gains firms achieve much greater governance and control over their data.

CONCLUSION: A FULLY AUTOMATED WORLD OF DATA

Although true data automation will empower firms to travel the last mile to full automation, the journey does not end there. The promised land for financial services is a stepping stone to a new operating model.

Data automation brings together all the disparate elements of the data pipeline, creating huge efficiencies. Some of those are obvious, such as far less time spent re-checking data. This is a big part of the last mile to automation; data is often checked at source, but firms have no visibility over how it may have changed during its life cycle.

Data that firms can trust allows them to be a more agile business. It makes projects, such as launching new products or onboarding new customers or counterparties, much easier and faster. Firms already have the data they need to analyse the viability of these new products and they can have full confidence in its accuracy.

Data automation creates agility at the end-user level, allowing the business as a whole to be more responsive. And by putting more power into the hands of data experts, automation frees up IT to focus on streamlining operations from an infrastructure standpoint.

On top of this, data automation creates an environment of trusted data sources with full clarity of the type of information that is available. This has enormous benefits for the business, unlocking much deeper insight and analytics compared to what is currently possible with the siloed nature of existing information architecture. This fuels enhanced measurement and reporting and allows firms to bring the full power of machine learning to bear on their data.

But despite the scope of these benefits, data automation can be implemented gradually. Firms can take a careful, phased approach that focuses on keeping controls in place and delivering measurable ROI at each stage of the project.

Indeed, the promised land can be reached on a case-by-case basis, every time firms bring data automation to a single pain point. An all or nothing approach is not required; small wins still make a big difference when it comes to the last mile of automation.

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