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# Preparing for AI at scale: How an enterprise is using LTI's Mosaic to raise its ML game

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## Defining Future Business Operations

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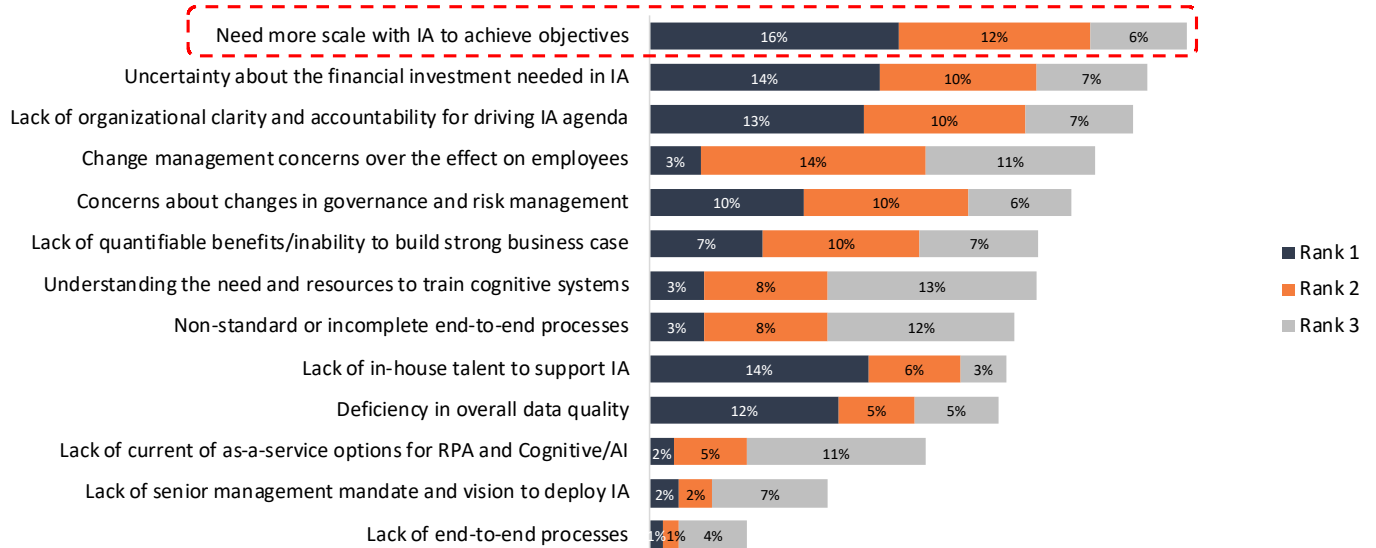
## Deploying machine learning at a global scale is a growing challenge for AI adoption

Our recent research into machine learning found that enterprises are bullish about AI adoption—expecting machine learning (ML) to influence many business operations in under two years. However, when it comes to execution, HFS observes a glaring chasm in implementing intelligent automation technologies. A lot of organizations have started with various automation tools—working through pilots, PoCs, and projects. However, planning and managing global deployments in production, beyond project work, is challenging.

AI and other automation technologies represent the next wave of advancing business operations for many organizations. Business leaders across all domains are increasingly seeking adaptable and intelligent predictive systems that can make better use of data and streamline operations. The move toward intelligent automation essentially provides an organization the opportunity to both fundamentally change how work is done and rethink business models with the combination of humans and emerging technologies.

**Exhibit 1: Scale is the biggest inhibitor to IA success**

**Q. What are the top three inhibitors that are holding you back from achieving strategic AND operational goals?**



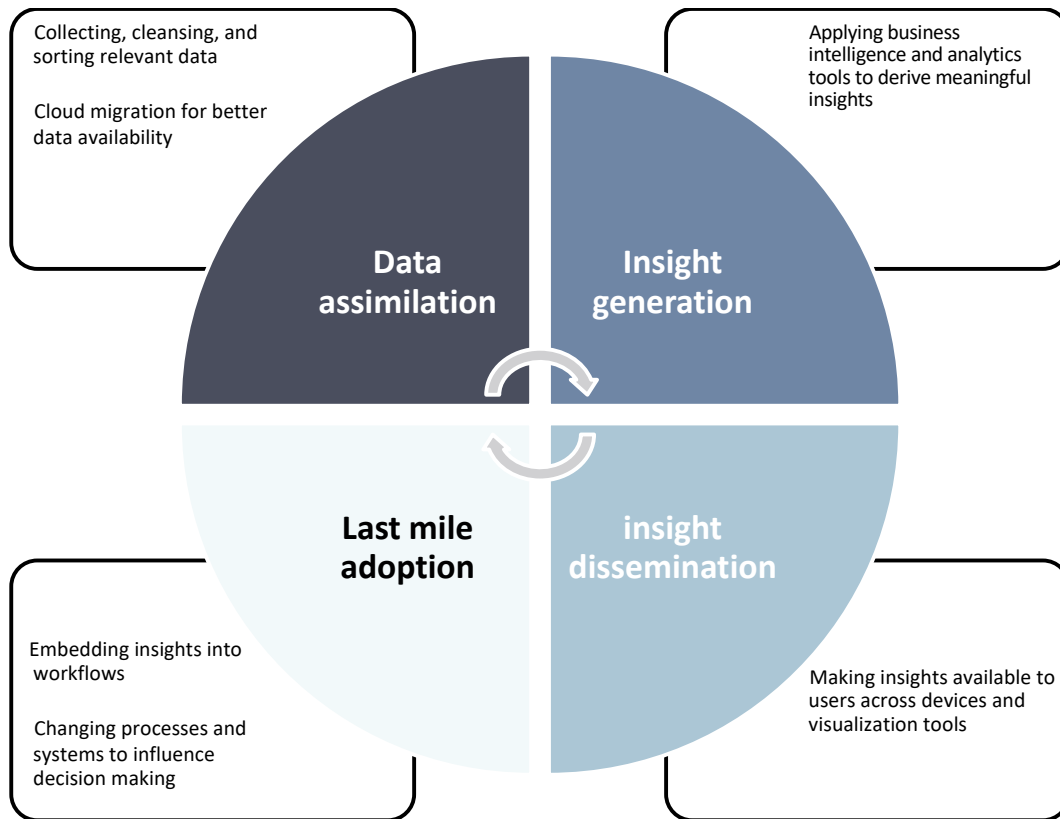
Source: HFS Research in conjunction with KPMG, State of Intelligent Automation, 2018

Sample = 590 business leaders including 100 C-level executives

As our latest study shows (see Exhibit 1), scalability emerges as the biggest inhibitor to the widespread adoption of intelligent automation technologies. Enterprises are at a point where they need to go beyond the “why” and “what,” and get to the “how.” They’ve identified business drivers and initiated projects—now how do they scale up and get maximum business impact from the investments in emerging intelligent automation technologies?

As our recent smart analytics [study](#) outlines, turning data into insight is a complex and multi-phased process for most organizations. Each stage—from the initial collection of data to the final consumption of analytical insights by business users—typically involves multiple teams and departments. Similarly, multiple technology platforms and tools need to come together to deliver on the promise of smart analytics, AI, and automation.

## Exhibit 2: The smart analytics lifecycle is a complex process for most organizations



Source: HFS Research, 2018

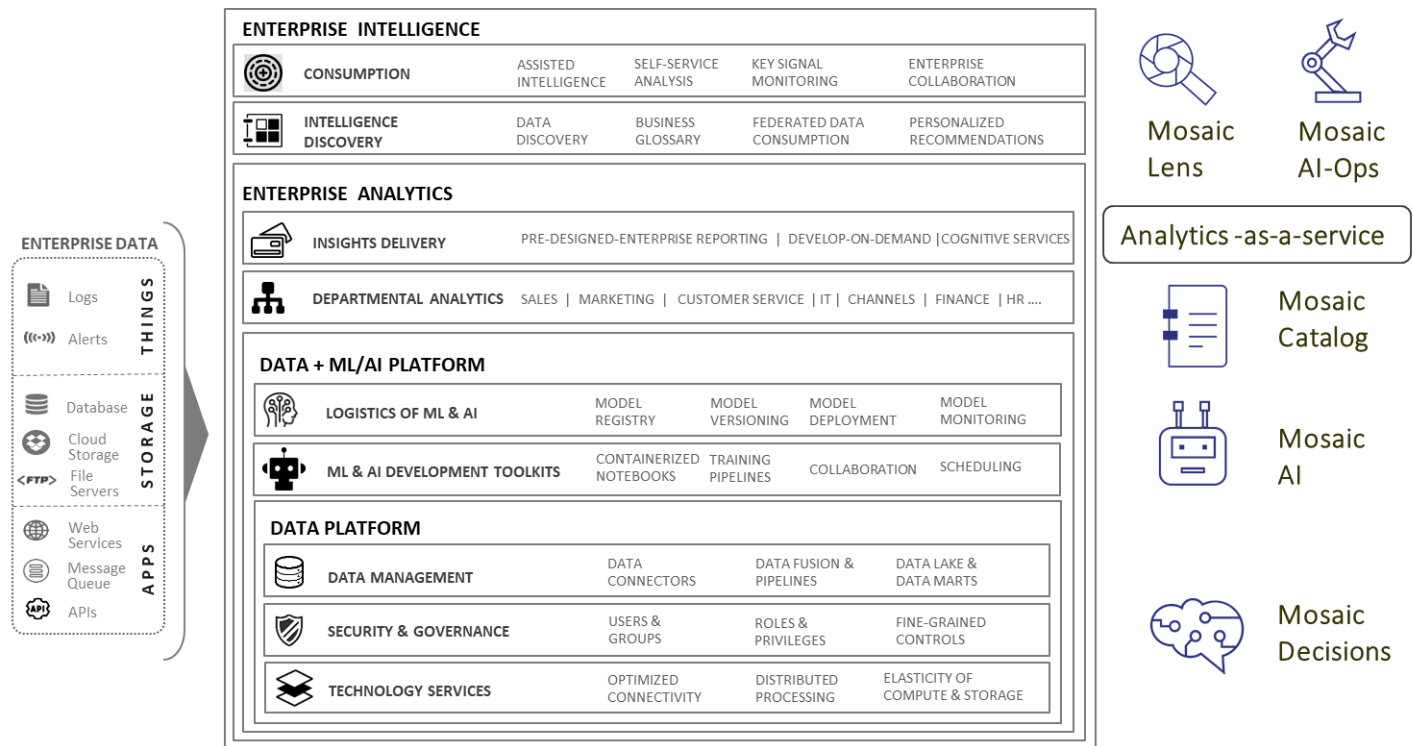
Business and technology groups must continuously iterate over each stage and explore new ways to improve efficiency and results. The iteration is critical given that technologies are constantly evolving across data assimilation, insight generation, insight dissemination, and last-mile adoption. HFS sees a promising opportunity for enterprises to use modern automation and analytics tools to create tighter feedback loops, better self-service, and more firmly embedded insights in business workflows, processes, and systems.

### LTI's Mosaic is taking "convergence" to heart by providing a hub for intelligent automation and analytics

LTI, a global technology consulting and digital solutions company, has spent considerable time thinking about how best to address these challenges for its enterprise clients. During our 2017

research efforts, HFS [outlined](#) LTI's investments in its analytics platform, Mosaic. This platform has now significantly evolved, with a conscious design that embraces the convergence of data, analytics, automation, and AI technologies. Mosaic encompasses data engineering, advanced analytics, knowledge-led automation, IoT connectivity, and AI, all wrapped up with an improved solution experience for different business and IT users.

**Exhibit 3: LTI Mosaic ecosystem components have been built to solve real client needs with AI, data, and analytics**



Source: LTI, 2019

LTI's Mosaic features five key components to help enterprises with different aspects of adopting analytics, AI, and automation technologies. The central theme is to give more flexibility and ease of use to the end consumers of data and insights and simplify the data management and automation tasks for technical data, analytics, and automation teams.

1. **Catalog:** Mosaic Catalog simplifies data search and consumption, providing a multi-faceted solution to the persistent enterprise challenge of not being able to access and search through all its data. Catalog has connectors to create a comprehensive, single view of all on-premise and cloud data stores. The platform also uses ML to undertake some elements of automated cataloging. Perhaps the most noticeable feature for end users is the ability to execute federated queries across multiple, disjointed datasets.
2. **Lens:** Mosaic Lens focuses on following the “unknown unknowns,” giving business users the ability to follow up on data visualizations and insights they are presented with. Using self-serve and assisted analytics, end consumers can conduct new analyses on presented data in a simple interface. This ability to dig deeper not only improves the level of analytics adoption but prevents business users from over-burdening the already constrained IT, data, and analytics teams with simple queries.

You can think of the Catalog and Lens components as the over-arching consumption layers built-in to give business users the ability to do more with data. These components have focused on values such as ease of use and user intuitiveness for the less-technical targeted personas through capabilities such as natural language searching and assisted wrangling.

3. **Automation:** Mosaic’s Automation module aims to optimize IT operations to boost productivity and efficiency, improve service levels, and reduce overall costs through the introduction of intelligent automation technologies. The module builds on the emerging concept of “AI-Ops” or applying algorithms to IT operations. It features ML-based cognitive engines that can analyze incoming events, with the ability to classify and categorize (e.g., types of tickets), co-relate (e.g., identifying root causes of related alerts), and forecast them (e.g., predicting incidents). Finally, Mosaic Automation orchestrates the enterprise’s response engine (both automated and human) to these events, inching towards the holy grail of autonomics—enterprise IT on autopilot.
4. **AI:** Mosaic AI deals with the logistics side of ML development, providing a co-engineering platform to its clients. Several clients in our research point out the tremendous challenges

with data ingestion and pipelining when building ML and deep learning models. Managing the modularity of AI is emerging as a key need for global deployments, especially given the distributed nature of data scientists, data engineers, and analysts. LTI can build containerized and micro-services-based architectures for complex data processing and analytics pipelines that are a necessity for scaled AI deployments. LTI has wisely kept its goal as serving multi-cloud environments, which many clients' environments will start to feature in the future on a global level.

5. **Platform—Decisions:** Mosaic Decisions is the over-arching data and analytics environment for enterprise clients to manage their AI, automation, data, and analytics initiatives. Decisions aims to improve the orchestration of these technologies, spanning data connectors and data processing, providing collaborative workbenches for data scientists, and developing a growing marketplace of pre-built industry use cases and solutions as a starting point for analytics. Decisions has helped clients with initiatives such as deploying hybrid data lakes and building automated data preparation tasks such as the ETL process.

LTI's emphasis with Mosaic is to mold the use of its platform components to co-exist with and enhance each client's existing technology stack and roadmap. Mosaic uses many open source technology elements, and LTI has built flexibility in to reduce complexities across both engineering and governance. Soumendra Mohanty, LTI's EVP and CDAO, outlines, "Our goal is to solve our clients' business challenges and deliver on outcomes. The Mosaic stack is an enabler; we are not going to clients with the idea that we just provide the platform for them to input data and get results." Depending on the use case and problem, one or several Mosaic components will be suggested to clients to solve their specific challenges.

LTI has adopted an approach to lay out a strong technology foundation for each component of the Mosaic stack and then work with selected clients to bring in additional depth to each component. For example, LTI worked with a large technology product company with very advanced AI logistics requirements and developed the AI component of Mosaic. Similarly, working with a large government body with the need for a very mature consumption layer, LTI created the Lens



component of Mosaic. In this way, Mosaic has evolved to solve real client needs across various parts of the intelligent automation and analytics lifecycle.

## A leading elevator company is using Mosaic to build scalability

### A company over 150 years old, seeking connectivity in the age of Industry 4.0

The leading elevator company in our research pioneered the vertical transportation system industry, becoming the world's largest manufacturer of elevators, escalators, and moving walkways. The enterprise fueled the industrialization of the modern world across the globe. The company operates across 200 countries and delivers personalized service through 31,000 mechanics worldwide.

The elevator company has been undergoing a digital transformation journey for the last few years. Transformation is an inevitable reality as manufacturing, product, and service design are impacted by digital technologies—the basis of the Industry 4.0 concept. HFS sees [Industry 4.0](#) as a seamlessly integrated network of machines, production processes, and manufacturing control systems. It is a digital manufacturing enterprise with the physical product at the core driven by information from an integrated information network among internal stakeholders as well as external entities such as customers and suppliers.

The company's views are similar in the world of Industry 4.0; its end goal is to make products better for customers. During our research, the Senior Manager, IoT, for the elevator company described the business drivers for his work across the company's digital transformation, IOT, advanced analytics, cloud architecture, and governance. He states, "The world is moving digital, and we had better keep up. In the elevator business, everyone is moving to automation. The industry's service margins are squeezed, and the labor market is tight. Profitability depends on selling more or servicing more."

While emerging markets are the prime sources of new business, developed countries have far lower growth and increased competition. Revenue growth and profitability growth are thus the

key business drivers. The elevator company's mission for digital transformation is to improve its products and how it services them. The Senior Manager explains, "We have to get better on tracking all our assets, whether they are physical, IP, or human. This journey into digital transformation helps us achieve that."

The company sees opportunities to leverage multiple technologies, namely the Internet of Things (IoT), smart analytics and data, machine learning, and automation tools to realize its goal. The use cases are two-fold:

- **Product impact:** The need to create a connected product portfolio with the ability to provide more visibility and modern functionalities to delight customers.
- **Service impact:** The need to optimize and streamline the servicing of its products worldwide to differentiate itself as a customer-centric and agile company.

From a servicing perspective, the Senior Manager outlines a critical need, "Our goal is to be proactive, so we don't wait for the customer to report issues with our products. We want to figure out any potential issues and act on them before they happen—becoming predictive, proactive, and transparent." The company is over a hundred and fifty years old and has a wealth of data it can mine to achieve these goals. Machine learning models can mine this huge data stash to learn and predict products' maintenance needs. Transparency is another important aspect of this use case—making sure everyone, including mechanics, helplines, supervisors, and product developers, can view a single version of the truth and act as a collective.

## Scalability becomes the name of the game for a worldwide roll out of ML deployments

With the vision for a connected future in place, the elevator company worked with third-party partners to design and implement a new overall architecture. However, it was a challenge for the company to scale its predictive machine learning models. The company's models needed a platform for data ingestion and the ability to scale hundreds of models across regions. LTI, an IT services provider, had experience with the company's IT services group and had also recently been

brought in to support the IoT infrastructure. LTI realized the client’s challenge with scaling their ML models and suggested Mosaic as a proposed solution during a subsequent RFP. The elevator company evaluated Mosaic against two other similar platforms and found it to be best suited for its needs.



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—Senior Manager, IoT, leading global elevator company

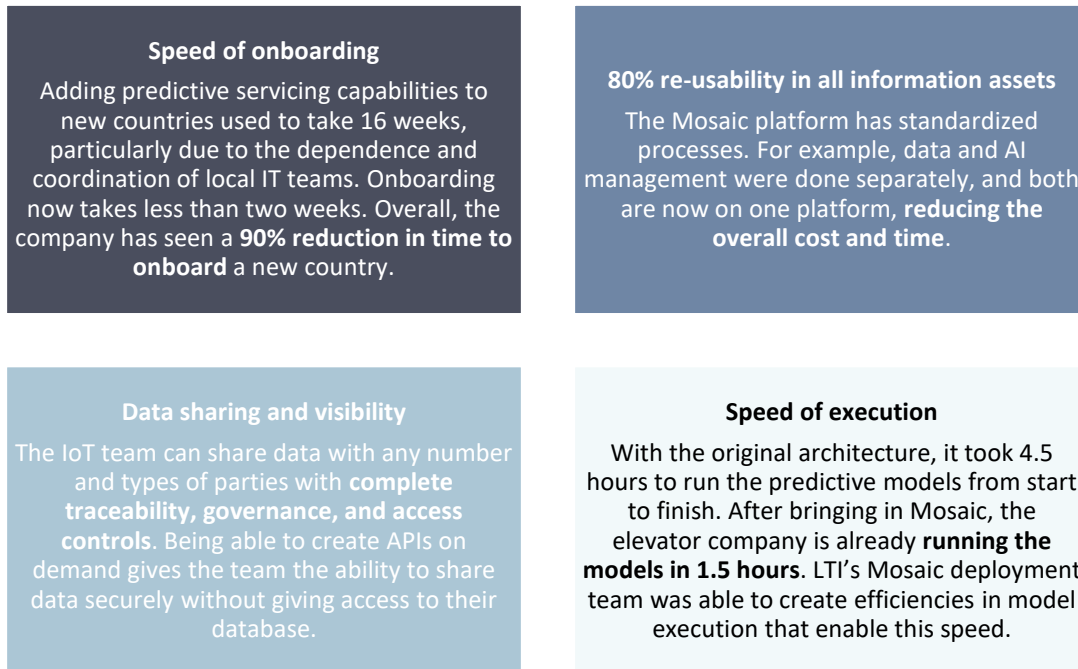
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The Senior Manager recounts, “Mosaic had interesting facets to it that made it more desirable for scaling up our program. Namely, the ML workbench, the ability to combine and split data pipelines, the data validations available, and being able to call APIs on demand. These modules also made Mosaic more appealing for our broader IOT vendor program. We could use this platform to drive other programs that we knew were on the horizon.”

Starting in April 2018, the enterprise began engaging with LTI on the Mosaic implementation, primarily deploying the Mosaic Decisions component. A little over half a year later, and the platform is now running in five countries. The organization is running its predictive engines on Mosaic on the cloud through Microsoft Azure. The team is using production data and undertaking final field trials. During these trials, the LTI deployment team analyzes the results continuously and makes needed improvements. At this time, LTI has completed implementation of the platform in all three Azure zones (US, Europe, and Asia) supporting multiple countries under each zone.

Even though the project is still underway, the organization has already started to realize multiple benefits from its Mosaic implementation. Overall, the company’s machine learning initiative is set up for global scalability through many improved features (see Exhibit 4).

**Exhibit 4: Mosaic makes global scalability achievable for elevator company**



Source: HFS Research, 2019

The speed of execution was one of the major bottlenecks preventing the company’s global adoption of the predictive engines. The Senior Manager explains, “4.5 hours in our world means that the supervisor gets the prediction late into the day, by which time mechanics already clock out. It’s a very personnel-based decision. Automation is all well and good, but in our industry, regulatory codes still require people to go maintain our assets. We must keep that human element in mind. If our mechanics and supervisors are not going to adopt this, this initiative will be a waste for our company.” Compressing the time required to get predictive insights greatly improved the company’s chances of success with this use case and kept the humans in the services loop, where they are needed the most.

## The elevator company's goal of self-service and predictive capability across the globe

The elevator company's IoT team believes that while it has come a long way already, the company is at least a year away from maturity on its predictive maintenance capability (and beyond). The Senior Manager's goals include reducing the models' execution time even more to 45 minutes. The progressive AI logistics modules available on Mosaic are a valuable next step. The goal is that using other components of Mosaic, especially the AI logistics component, will allow the company to optimize the AI model building and deployment process and build in more flexibility for data scientists along with enterprise-level governance and scalability with production.

Ultimately, the IoT team is aiming for each country's IT and operations leaders to build and manage their own pipelines and models. The Senior Manager opines, "Right now everything is done by my group, which is not sustainable. We operate in 160 countries, and our team doesn't have the bandwidth for that." Extending the skills necessary for this to several countries will require significant training using Mosaic's persona-based access and change management to keep adoption going smooth.

Further, as the company keeps iterating and expanding on the machine learning models it is using, better model management becomes a necessity. Required improvements include being able to track history, trend performance, and scale further up when the company's usage loads go up. The elevator company and LTI are working through scenarios for efficient scalability and model management for the company's AI needs well into the future.

**The Bottom-line: As global organizations inject more and more AI into their operations, they need to parallelly prepare for cloud-based scalability, self-service, and automation to get to the desired goals of anticipating customer needs. Seek a partner or solution that can deliver on these broader capabilities.**

Developing the technological and process discipline for data-driven decisions is set to become an imperative for businesses in the future. With the help of LTI, the elevator company is on this

journey toward industrialized AI. LTI, for its part, is taking a progressive stance with Mosaic and developing new ways to help clients with the increased convergence of automation, AI, and analytics. Both organizations are developing best practices as they go, cultivating key learnings that will inform the elevator company's strategy on a go-forward basis. HFS strongly believes that in a developing industry such as intelligent automation, sharing results and emerging best practices is extremely valuable to the broader community. These experiences help minimize the hype and advance the effective use of intelligent automation. The Senior Manager's recommendations for success include:

- **Know your data:** "It will make your life a lot easier if you have clean data!" says the Senior Manager. "Ninety-nine percent of companies have bad data, and it causes innumerable problems. Have a clear idea of where you want to be and make sure your data can support that. All other things can be changed—your platforms and technologies, partners, etc. But if you have bad data, you are toast. It is, after all, a data-driven journey."
- **Find a partner whose product team is invested in solving your problem:** The elevator company considered other competitors for its program and found that their product teams were hard to access and unreceptive to the company's needs. LTI's Mosaic team shone through because of the willingness of its product group to collaborate with the organization to build in necessary functionalities that would mutually benefit the companies.

## HFS Research authors

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Reetika Fleming is Research Director, Insurance, Smart Analytics & AI at HFS Research. She studies the broad use of data and analytics within enterprises, with a research focus on emerging strategies to institutionalize machine learning and other AI techniques. Her research extends into industry trends for the insurance vertical, including the impact of digital business models, IoT, Smart Analytics, and AI on property and casualty, life and annuities, and reinsurance companies ([view bio and contact details](#)).

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