In June 2018, Ant Financial, a Chinese fintech company spun out of Alibaba four years earlier, was already worth more than either American Express or Goldman Sachs. Ant Financial employs fewer than ten thousand people, but has over 700 million customers. American Express, by contrast, had 59 thousand employees serving roughly 112 million card holders. How is Ant Financial able to do so much more with so much less?

The answer can be found in the digital operating model that Ant Financial has adopted, and specifically the company’s mastery of artificial intelligence (AI). By relying on AI-enabled digital automation, Ant Financial is able to process loans just like other banks, but at one thousandth the cost and with zero human interaction.

As this one example illustrates, AI can change everything about a company, from the products it offers to its operating model. Indeed, the changes AI has already brought to numerous industries are so disruptive and profound, argue Harvard Business School Professors Marco Iansiti and Karim R. Lakhani in their book, *Competing in the Age of AI: Strategy and Leadership When Algorithms and Networks Run the World*, firms must now strive to reinvent themselves around these new technologies and capabilities if they hope to grow, compete, and survive.
AI: From Tool to Business Transformation

Many other companies—Uber, AirBnB, Peloton, Google, and Amazon—have made AI either central to or a significant part of their operations. When we look at how these companies have adopted AI, we find that it transforms operating models along three dimensions:

1. Scale
AI and the digital infrastructure behind it allows companies to grow rapidly and efficiently, delivering more value to more customers at the lowest possible cost. As we saw with Ant Financial, the marginal cost of serving an additional customer becomes essentially zero, apart from the small incremental cost of more computer power.

2. Scope
An AI-enabled digital operating model allows companies to rapidly expand the scope of products and services they offer their customers. Ant Financial was initially built around a payment app called Alipay, and gradually expanded with a private online bank, an investment platform, a wealth management platform, and a social credit scoring system.

3. Learning
The data processing power at the heart of an AI-enabled enterprise enables these companies to learn and improve continuously. Learning in this context depends on relentless experimentation. LinkedIn, for example, runs over 40,000 experiments each year, and Google over 100,000, all to test improvements to their service.

This type of transformation and the innovations it produces would not be possible without the power of AI. To harness that power, however, these companies have had to construct a sophisticated technical architecture.

Creating an architecture that supports an AI-enabled digital enterprise begins with the construction of an “AI factory.”

The Technical Architecture of an AI-First Firm

Putting AI first means reducing the amount of work done by humans and increasing the amount of work done by digital agents and systems capable of carrying out tasks at a speed and scale far beyond what humans are capable of.

Creating an architecture that supports an AI-enabled digital enterprise begins with the construction of an “AI factory,” what Iansiti and Lakhani describe as “the scalable decision engine that powers the digital operating system of the twenty-first century firm.”
The Four Essential Components of the AI Factory

1. Data Pipeline
AI runs on data, so the AI factory needs a process for collecting, cleaning, integrating, and protecting data in a systematic, sustainable, and scalable way.

2. Rewards are Consistent with Values and Objectives
Algorithms generate predictions about future states of business and the results of actions it might take. In this way, algorithms guide an organization’s most critical operating activities.

3. Experimentation Platform
Predictions need to be verified by rigorous testing. Running experiments allows organizations to operationalize the predictions made by AI.

4. Software Infrastructure
Finally, all these components must be embedded in a cohesive software infrastructure that provides all users with access to the data and insights they need.

Bringing this AI factory to life means creating a data and technology platform that permeates and supports the organization. This platform serves as a common foundation of data inputs, software technology, and algorithms that agile teams can use to develop applications addressing everything from customer experience and customer relationship management to pricing, inventory management, distribution, and beyond.

With these tools at their disposal, an organization can commit itself to continuous performance improvement. This cannot succeed, however, without an experimentation culture throughout the enterprise. This means experimentation must be democratized and rewarded from the top down; anyone in the organization with a hypothesis should be able to launch an experiment and use the results to implement meaningful change.

Finally, the organization must emphasize modularity, enabling it to reuse the software and algorithms it has developed. This requires shifting the organizational focus from siloed, proprietary technologies and software to an emphasis on shared development and open source.

As one can easily imagine, taking full advantage of this powerful technology requires a transformation of the organization, a transformation that must include its current management and leadership structures.
The Five Principles of AI Transformation

Becoming an AI-driven organization is not a trivial process. It is not about spinning up separate experimentation labs or creating a new AI department. Instead, it demands a commitment to fundamentally changing the core of the company by building a data-centric operating architecture which in turn fosters ongoing change.

A successful AI transformation should be guided by five underlying principles:

1. **Unified Strategy**
   Effecting a transformation of this nature, which involves shifting the operating model of an entire organization, calls for absolute strategic clarity and commitment. Leadership must communicate this commitment and clearly articulate the goal of this transformation, putting a special emphasis on the importance of unity. The ultimate goal is to facilitate multifunctional collaboration.

2. **Architectural Clarity**
   In addition to a unified vision for the company as a whole, the organization needs clarity around the technical goals. Everyone must understand what the desired future operating model will look like. A strong focus on data, analytics, and AI requires consistency and centralization. Standard policies, components, and infrastructure will also become increasingly critical as AI efforts grow in sophistication.

3. **Agile, Product-Focused Organization**
   When building applications to power an organization, the developers of these applications must understand the context for which they will be built and deployed. They must also build them in ways that prioritize modularity, connectivity, and reuse. This calls for a product focus on the part of developers as well as an agile development methodology aimed at meeting the specific needs of end users in a quick, efficient, and iterative manner.

4. **Capability Foundations**
   Building new capabilities in software engineering, data sciences, and advanced analytics will require finding new people. Specifically, the organization will need people who can identify important use cases and lead teams in developing the new applications the organization will rely on going forward. Ultimately, this will lead to the emergence of a new type of business leader, one who drives a deeper analytics and software mindset and understands the full impact, both positive and negative, that AI can have.

5. **Clear, Multidisciplinary Governance**
   AI can bring a host of benefits, but can also unleash a range of unintended consequences, not to mention privacy and cybersecurity challenges. With this in mind, AI requires serious consideration of legal and ethical issues. The organization will need governance based on collaboration between people from different disciplines and functions, and policy and product decisions must be guided by legal, corporate affairs, and communications experts. The issues these stakeholders consider should take into account the impact of decisions on customers, the community, and the partner ecosystem.
Leadership in the AI Age

Successfully transitioning to an AI-driven organization requires leaders who not only are committed to fundamental change, but also have a deep understanding of the technology and its capabilities. Leaders don’t have to be data scientists themselves, but they must understand the power of what data scientists and people in related roles can do.

These leaders must also appreciate the softer side of transformation. They need to be able to address the concerns of people as they increasingly interact with and manage digital systems, particularly as roles and responsibilities continually evolve across the organization.

Most of all, today’s leaders need a good, well-informed sense for the type of culture that’s necessary for supporting a digital organization, especially one that prioritizes decentralization, experimentation and entrepreneurship.

“As digital networks and AI increasingly capture our world, we are seeing a fundamental transformation in the nature of firms. But despite all this newfound digital automation, we can’t do away with management just yet. However, leading through these challenging times will require a new kind of managerial wisdom.”

— Marco Iansiti, David Sarnoff Professor of Business Administration
Karim R. Lakhani, Charles Edward Wilson Professor of Business Administration

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