POWERED BY BLOCKCHAIN: REALIZING AI’S FULL POTENTIAL
Blockchain’s ability to securely expand an AI implementation’s access to data across organizations will drive a whole new set of insights and value.

Artificial Intelligence (AI) could change the world more than any other advancement since the Industrial Revolution; fundamentally reinventing how businesses compete, grow, and succeed. However, each AI system, and each algorithm within, is dependent upon training and acting upon trustworthy data to which it has access; typically limited to the organization implementing it. Simultaneously, blockchain is redefining business processes and systems of record, enabling secure and confident access to shared data between organizations and increased trust and confidence in the data. Together, AI and blockchain will enable organizations to exceed their current boundaries and gain access to significant amounts of trapped value.
Blockchain: the perfect partner for AI data

As surely as steam powered the Industrial Revolution, the ample flow of accurate data will drive artificial intelligence systems.

Leading business innovators recognize data’s central role in harnessing AI’s value, though many feel constrained by the relatively meager flows of trusted information they can currently draw upon to feed their systems. That’s why the leading technology firms have invested billions to acquire data-focused companies and their capabilities. The power of AI depends on the access to, magnitude, and quality of the data it can process.

So, while AI redefines the systems of business engagement, blockchain is recalibrating the systems of record. Together, they will remap organizational boundaries, moving them from siloed verticals with complex processes to operate efficiently across horizontals, and, in the process, releasing large amounts of currently trapped value.

Meeting the challenge; capturing the opportunity

AI systems are dramatically changing the nature of services and experiences for consumers. The current phase of the scaled use of AI has focused on the value and services individual organizations can deliver to people. This “internal application focus” results from the natural commercial emphasis of individual businesses attempting to drive profit and growth. Companies usually start with what they can do and control and the data they store in their systems. Rarely can a single organization comprehensively meet a consumer’s holistic needs, and most current AI implementation efforts reflect that limitation.
Take the example of a family relocating to a new home; one of the most basic aspects of life. Basic, yes, but simple? Not really. A myriad of organizations will focus on that single objective, including banks, insurance companies, realtors, inspectors, movers, retail firms (purchases for the new house), new school systems, utility companies, postal systems, the department of motor vehicles, tax authorities, and more. Today, virtually none of these organizations share access to the same information, and consequently, the family’s data remains fragmented and perhaps inaccurately replicated across different players. To sort things out, the family must message data back and forth with each organization. As all these entities begin to implement AI systems, they will focus mainly on their own data or information they have permission to access and that could limit AI’s effectiveness.

Now imagine a world where, through a blockchain-based system, every party involved in the move could see the data and information pertaining to the end-to-end relocation process with appropriate permissions granted by the stakeholders—in this instance, the family. Organizations could access just the data they need, and because the information reflects blockchain’s enhanced trust levels, parties no longer need to engage in messaging and reconciliation. As organizations widely implement these kinds of models, the possibilities for AI systems will grow significantly.

In this situation, AI could become a type of consumer advocate service. A family would “own” and control their data since they alone would have full access to it. As a result, they would act as the conduit to drive that data into an AI system, which then makes recommendations and optimizes the data for their benefit.
AI systems will evaluate and optimize the elements of the moving experience across the end-to-end process, making links and connections that simply can’t be done today without severely overtaxing current fragmented data sets. For instance, an AI system could potentially access data related to the operational data for a house, including its historical utility/energy use, its insurance claim history, maintenance schedule, weather data, and combine this with the family’s behavior patterns, including hobbies and entertainment options, and use this and other information to calculate an accurate home maintenance cost profile. It could then design a service and insurance plan custom-tailored to the family’s needs.

In the future, wider access to data across an ecosystem and the advances in automated business logic via smart contracts could enable new and greater access for AI machines to traverse business ecosystems and deliver more comprehensive solutions to customers.
AI’s promise: for starters, doubling today’s economic growth rates

Artificial intelligence could double annual economic growth rates in 2035, according to an analysis of 12 developed economies by Accenture Research. It will change the nature of work, creating new, human-led relationships with machines that should increase labor productivity by up to 40 percent. And that’s just the beginning.

By helping people work smarter, AI could boost average profitability by as much as 38 percent, producing a bounty of up to US$14 trillion across 16 industries by 2035. The information and communication industry alone could deliver an extra US$4.7 trillion in gross value added in that year.

Combining multiple technologies in unique ways, artificial intelligence enables leaders to harness new entrepreneurial savvy that can rapidly sense and comprehend opportunities or threats, act on that information, and ultimately learn from the experience.

“It’s critical that businesses act now to develop strategies around AI, that put people at the center, and commit to develop responsible AI systems that are aligned to moral and ethical values that will empower people to do what they do best—imagine, create and innovate.”

Paul Daugherty, Accenture Chief Technology and Innovation Officer
Use cases: blockchain makes AI better—faster

The combination of AI and blockchain is fueling the onset of the “Fourth Industrial Revolution” by reinventing economics and information exchange.

DISTRIBUTED ARTIFICIAL INTELLIGENCE
MAS is formed for solving the task. Centralized management and coordination of work of several intelligent agents are carried out.

DECENTRALIZED ARTIFICIAL INTELLIGENCE
The activity of autonomous agent in dynamic multi-agent environment is investigate.

ARTIFICIAL LIFE
The processes of a decentralized management, evolution, adaptation and cooperation in MAS, consisting of a large number of reactive agents, are investigated and stimulated.
As the following examples demonstrate, from healthcare to government and beyond, the potent combination of AI and blockchain is slowly but surely transforming industries and institutions worldwide.

1. Smart energy, smart buildings

Green-friendly AI and blockchain solutions can help reduce energy waste and optimize energy trading. For example, an AI system with access to a host of city-wide data sources through blockchain could be used to maintain a building, such as overseeing energy use by considering factors like the presence and number of residents, seasons, and even traffic information. To supply the energy, distributed blockchain technology will ensure transparent and cost-effective transactions between producers and consumers, while machine learning algorithms that can hone in on transactions to estimate pricing. What’s more, blockchain combined with AI could significantly expedite real estate-related transaction processes, which can otherwise go through too many channels before a contract is approved.

2. Public science

The “file-drawer problem” in academia occurs when researchers don’t publish “non-result” experiments. Because no record of them exists, duplicate experiments and a lack of knowledge follow, trampling scientific discourse. To resolve this problem, research institutions could store and access an index to academic research, making this experimental data available across the ecosystem. By adding data analytics to the combined data, scientists would have a much richer data set to pull from than would be feasible within a single institution. Then they could begin to identify elements and patterns, such as how many times teams have tried the same experiment or determine the probable outcome of a certain experiment, with greater certainty.

Hossein Kakavand, CEO of Luther Systems, asserts that AI will also play a bigger role in public science once “smart contracts” transacted using blockchain technology require smarter “nodes” that function semi-autonomously. Smart contracts simulate contractual agreements and can have wide-ranging applications—in public science and elsewhere—when academics embrace the blockchain for knowledge transfer.
3. Supply chain

The advancement of free trade has created increasingly complex global value chains. As goods move across production and supply networks, they cross through multiple jurisdictions, connect both advanced and emerging economies, involve multiple players and are subject to different laws and standards. This all requires a great deal of coordination, which not only adds to the complexity, it adds to the costs of these goods. The Global Alliance for Trade Facilitation, for example, estimates that roughly seven percent of the global value of trade is absorbed in documentation costs alone.

Blockchain-based digital identity promises to make the supply chain leaner, simpler, and more cost-effective. Digital identity for all actors, goods, and places in a supply chain, establishes provenance and a means of trackability throughout all touchpoints in the supply chain. Through creating digital representations of real-world assets, and tracking the relevant data of those assets as a single, shared source of information, major efficiencies and product improvements can be realized. Rather than valuable data being collected in siloes across myriad stakeholders, including manufacturer, distributor, wholesaler and retailer, data could be shared across relevant stakeholders.

Through adding artificial intelligence to the platform, that data can be fed through a variety of algorithms to improve the supply chain further. Consider the 3 A’s progression of AI, as it evolves from being an assistant to an advisor to an agent, applied to a shipment of apples. As an assistant, the AI can enhance accessing the data through a chatbot interface – one can ask and receive answers to specific questions like ‘Where are the apples now?’ or ‘What temperature are they being stored?’ As the technology and application becomes more sophisticated, the AI can be an advisor and proactively alert the employee of potential issues. If the AI has detected a high likelihood of storms, it can advise rerouting the shipping freight or if the weather is projected to spike, it can recommend additional cooling. And as the AI learns and demonstrates a high level of aptitude, it can become an agent by acting upon its recommendations, rerouting or adjusting the temperature itself.
4. Smart devices

As the Internet of Things progresses and our lives are integrated with smart devices, a combination of blockchain and AI will be used to decide how these devices act, interact, and transact. Sensors will be widely prevalent to learn and ingest real world information, with AI used to train and improve the devices understanding and actions made from the data. When a refrigerator is out of milk and needs to communicate to a corresponding device its desire to purchase milk, a blockchain platform will facilitate this interaction. And just as consumers today use reviews on websites to evaluate the quality and trustworthiness of a site, AI will be able to look through each device’s history of transactions (hosted and secured on the blockchain) to determine which devices to trust, and even characteristics such as which agent most often delivers the milk quickest.

5. Identity

Accenture is a founding member of the ID2020 Alliance, a UN-affiliated public/private partnership committed to applying the latest in innovative technologies to provide verifiable digital identities to the 1.1 billion individuals that currently cannot prove who they are with any certainty. This and similar applications of blockchain technology for identity can be combined with AI to monitor the environmental conditions in a refugee camp or community health information and produce insights to guide care and support. As AI can more quickly digest and analyze this data, more accurate and timely decisions can be made to support the at-risk groups.
6. Healthcare

In healthcare, AI is revolutionizing diagnosis and treatment planning at scale. Early progress has been made with AI systems to improve cancer treatments, as well as Google’s DeepMind building capabilities to diagnose eye diseases through analyzing medical images. Smart, personalized medicine can improve health outcomes, but people are wary about sharing such personal data. For a standard hospital visit, data is likely collected by the primary care physician, the hospital, and labs where tests are processed, and that data could be lost, entered incorrectly, or be subject to hacking. By enabling secure and controlled shared access to health data through blockchain systems, patients can reclaim ownership of their data and allow access to it on a case-by-case basis. This would allow patients to benefit from AI-enabled personal care, while knowing their data is protected and encrypted.
Blockchain: redefining trust

Blockchain is a new type of database system that maintains and records data so that multiple stakeholders can confidently and securely share access to the same data and information. As such, it is changing the nature of boundaries between organizations.

Since the invention of modern databases in the 1950s, the governing business model concerning them has centered on trust. For example, Party A needs to have confidence that Party B (or anyone else) hasn’t unilaterally changed any data. Consequently, companies traditionally build data systems they can fully control and operate using a “messaging” based business model. In this case, Party A sends its view of the world in a “message” to Party B, and vice versa. Only when both parties can reconcile those views will they complete the business transaction. Blockchain is changing that concept of trust in data.

Through blockchain and other types of Distributed Ledger Technologies (DLT), companies can now access a common shared data set that they and other stakeholders know they can trust.

This new definition of trust emerges from several key blockchain concepts:

**Provenance:** Each participant with appropriate access can view the full history of a data element—from its inception through each stage of its lifecycle—including who introduced it to the system, all pertinent events and the key parties involved.

**Tamper-evident:** Thanks to sophisticated math and software rules, data is extremely difficult to manipulate without everyone knowing. As a result, participants can prove to themselves that the data has not been tampered with.

**Control:** Participants have the ability to specify access permissions at a data element level vs. to a traditional database, data table, or row level; allowing a significant increase granularity of control.

**Security:** Protection and control can be implemented at the data element level instead of the database or data table levels, making it much more difficult to penetrate.
Successfully melding AI and blockchain

Two new digital technologies could create synergies unlike anything the business world has ever seen, but tapping into that power could be challenging.

Companies that recognize the power of this combination will have to manage coordinated technology implementations and more complex transformations. To navigate the challenges ahead, leaders will need to think through several key decisions.

Dealing with privacy issues. AI thrives on oceans of data, and blockchain can expand that access and ensure information’s trustworthiness, but privacy concerns could scuttle initiatives before they’re even launched. For example, one experiment focused on AI and blockchain technologies has already created controversy by using patient data without consent. What’s more, the EU’s data privacy rules, which took effect in 2018, threaten massive fines for organizations that violate them.

Working with regulators and governments to demonstrate the value AI-plus-blockchain can deliver to individuals and society at large should be a mandate.

Thinking outside of the (corporate) box. AI needs comprehensive levels of data to function optimally, but most companies restrict the amount of information available due to trust issues. While blockchain offers a way to enhance trust and security, enabling shared access to data and securing this information appropriately require significant amounts of effort and resources. That puts a premium on understanding the value at stake in AI plays and creating a workable strategy to obtain it.
Preparing for a mega-mindset shift. Most leading companies are already hard at work digitalizing their organizations, introducing things like cloud concepts and big data analytics. This “stretching” of formerly static processes, policies and procedures can certainly help prepare organizations for the transition to human-led AI, but to achieve its fullest potential, companies must investigate and plan how to integrate it and blockchain effectively and embed these technologies into your overall corporate strategy to “pivot to the new”.

Pivoting to the new is a way of framing the digital age that demands companies exist in a constant state of change.

“Leading companies rotate to the New successfully not in spite of their legacy businesses, but because they strengthen them to release the resources needed to scale new business activities.”

OMAR ABBOSH, Chief Strategy Officer, Accenture

That means a new approach to organizational change that enables companies to:

1. Transform the core business to drive up investment capacity
2. Grow the core business to sustain the fuel for growth
3. Scale new business to identity and scale growth areas at pace

It’s a deliberate approach that can yield big results.
Conclusion

Blockchain helps deliver upon the promise of AI by providing new levels of data access, trust, and security. Several organizations are already experimenting with this combination of technologies, but initiatives largely remain in the pioneering mode. As confidence increases and companies zero in on trapped value pools, the growth of AI-plus-blockchain plays will likely explode. In this environment, leaders need to stake an early claim to the talent, resources and capabilities their companies will need to succeed in this fast-moving new business world.
About the authors

David Treat
Managing Director, Global Blockchain Lead

Dave has driven Accenture's blockchain practice globally, engaging clients in all industries, from pure R&D to full scale transformations.

Alissa Worley
Marketing Director

Alissa is the global marketing lead for the blockchain strategic growth initiative, building the practice across all Accenture businesses and industries.

Justin Herzig
Global Blockchain Research Lead

Justin leads a team of technology and business researchers to explore the opportunities of blockchain technology.

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